The International Seismological Summary.

1933 January, February, March.

FORMERLY THE BULLETIN OF THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

January, 1933, starts the 16th volume of the International Seismological Summary.

During the last five years the numbers of determinable epicentres in the various quarters have been as follows :—

	1928	1929	1930	1931	1932
January	140	150	116	151	120
April	183	190	168	146	176
July	150	150	156	204	130
October	122	113	213	133	143
	595	603	653	634	569

There is thus no evidence of the development of recording services increasing the number of earthquakes which can be worked out as formal determinations. This is very much to the good, since the result of increasing the number and quality of observing stations should be to give better records of earthquakes which can be well observed, rather than increased power to notice movements so slight as to record vague phases at only a few stations. The latter leads to unfruitful work in the attempt to utilise unreliable data and construct hypothetical determinations of little value.

In the matter of making determinations of earthquakes when observations of P are plentiful the equation derived from a group of stations in Azimuth Z is

$$dx\ \mathrm{Cos}Z + dy\ \mathrm{Sin}Z + dt\frac{d\Delta}{dP} = \alpha$$

where the symbols have the usual meaning.

Before solving this by least squares it is multiplied through by $\nu \frac{dP}{d\Delta}$ where ν is the numerical weight to be applied to the equation, giving

$$dx\ \nu\frac{dP}{d\Delta}\mathrm{Sin}Z + dy\ \nu\frac{dP}{d\Delta}\mathrm{Sin}Z + dt\ \nu = \alpha\nu\frac{dP}{d\Delta}$$

which is equivalent to

$$\nu\frac{dP}{d\Delta}d\Delta + \nu\,dt - \nu\tau = 0 \text{ where } \tau = \alpha\frac{dP}{d\Delta}$$

the equation directly derived from consideration of the time of arrival of P.

The changed procedure removes the charge of applying too great a weight to more distant stations, due to the factor $\frac{d\Delta}{dP}$ which increases with Δ. When the determination is good, as in most widely recorded earthquakes, the introduction of this modification of procedure does not greatly affect the result. The change, however, is based on such fundamental considerations that its adoption was necessary, and much of the work for the determinations of 1932 was carried out in the new manner.

"Ana-seism and Kata-seism."

Where information is available an attempt has been made to discriminate between an earthquake in which P is a condensational wave—*i.e.*, the initial motion is away from the epicentre—called an "Ana-seism," and one in which the P is a dilatational wave—called a "Kata-seism." The distinction is indicated in the Summary by a letter *a* or *k* after P and PKP phase in the tabular part of an earthquake (*e.g.*, 1933 Jan. 9d. 2h., p. 22, Manila and La Paz), but can only be made in cases where the nature of the original motion is specified in the station bulletin. The Z record is particularly useful in this connection as an original upward motion must indicate an "Ana-seism" whatever the direction of the epicentre.

It is to be hoped that information of this kind will become more generally available when its value and interest is recognised by observers.

This quarter of the Summary deals with 165 epicentres, 67 being new and 98 repetitions from old epicentres. The quality of the material is as follows :—

N.1=11	R.1=12	X.=61
N.2=21	R.2=14	
N.3=35	R.3=11	

The cases of abnormal focus are as follows :—

	Date.				Epicentre.		Focal Depth.
	d.	h.	m.	s.	°	°	(Below Normal).
Jan.	1	8	48	46	15·1S	167·8E.	+0·020
Jan.	3	22	40	59	38·8N.	138·4E.	+0·040
Jan.	9	2	1	47	36·5N.	70·5E.	+0·025
Jan.	18	17	15	1	51·1N.	149·0E.	+0·070
Jan.	20	12	12	13	36·5N.	70·5E.	+0·025
Feb.	4	6	18	0	27·7N.	140·0E.	+0·080
Feb.	9	3	56	56	31·6N.	138·8E.	+0·050
Mar.	11	19	32	46	26·2N.	141·0E.	+0·080
Mar.	18	15	51	35	32·4N.	139·7E.	+0·020

1933 JANUARY, FEBRUARY, MARCH.

Jan. 1d. 8h. 48m. 46s. Epicentre 15°·1S. 167°·8E. N.2.

A = −·944, B = +·204, C = −·261; D = +·211, E = +·977;
G = +·255, H = −·055, K = −·965.

A *depth* of focus 0·020 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Suva		−0·2	10·6	108	1 2	−84	3 8	−75	3·3	3·8
Arapuni		−1·0	23·9	165	5 2	+ 2	10 14?	+71	12·2	—
Riverview		−1·0	23·9	216	i 5 2	+ 2	i 9 10	+ 7	—	—
Sydney		−1·0	23·9	216	e 4 50	−10	e 9 20	SS	12·0	12·6
Wellington		−1·2	26·8	169	5 31	+ 6	10 44	SS	14·2	18·2
Melbourne		−1·4	30·3	217	i 5 57	+ 2	10 32?	−15	12·9	14·1
Adelaide		−1·5	32·8	227	i 6 14	− 3	i 11 26	+ 2	i 14·6	19·7
Palau		−1·7	39·9	302	7 12	− 5	12 56	−13	—	—
Amboina		−1·7	40·6	282	7 24	+ 1	i 13 17	− 3	19·2	—
Honolulu	T.H.	−2·1	49·6	44	e 9 22	+50	i 16 23	+57	20·2	—
Perth		−2·1	50·0	240	e 8 5	−30	i 15 17	−14	—	25·2
Manila		−2·3	55·0	301	9 14	+ 2	16 52	+14	26·2	—
Nagoya		−2·4	58·1	331	10 7	+33	(17 57)	+38	17·9	—
Miyazaki		−2·4	58·5	323	9 38	+ 1	17 27	+ 3	—	—
Sumoto	E.	−2·4	58·5	329	9 36	− 1	18 20	PS	—	—
Osaka		−2·4	58·5	329	9 36	− 1	17 27	+ 3	—	—
Koti		−2·4	58·6	327	e 9 35	− 2	—	—	—	—
Kobe		−2·4	58·7	329	i 10 10	+32	e 18 22	PS	—	—
Mizusawa	E.	−2·4	59·7	337	9 54	+ 9	18 6	+26	—	—
	N.	−2·4	59·7	337	10 7	+22	17 24	−16	28·6	—
Nagasaki		−2·4	60·0	324	9 48	+ 1	12 45	?	15·9	18·7
Batavia		−2·4	60·4	271	9 49	− 1	i 17 53	+ 4	e 37·2	—
Taikyu	N.	−2·5	63·0	324	e 10 52?	(−13)	e 18 34	+11	—	—
Zi-ka-wei	Z.	−2·5	64·2	316	10 8	− 8	—	—	—	—
Hong Kong		−2·5	64·5	304	10 17	− 1	18 41	− 1	—	—
Keizyo		−2·5	65·2	325	e 10 22	− 1	e 18 48	− 3	—	—
Zinsen		−2·5	65·3	325	10 22	− 2	18 51	− 1	e 28·7	—
Nanking		−2·5	66·5	315	i 10 29a	− 3	i 19 6	− 1	e 24·3	29·5
Heizyo		−2·5	66·9	325	11 8	(−13)	19 11	− 1	e 29·4	—
Phu-Lien		−2·6	69·9	299	e 10 54	0	19 49	+ 1	—	—
Medan		−2·6	70·9	279	11 10	+10	i 20 12	+11	—	—
Chiufeng		−2·6	73·1	321	i 11 11a	− 3	i 15 59	PPPP	—	—
Ukiah		−2·7	84·0	47	—	—	e 22 28	− 2	e 35·0	—
Berkeley		−2·7	84·2	48	e 12 20	+ 4	—	—	—	—
Santa Barbara	E.	−2·7	84·7	52	e 12 23	+ 5	—	—	—	—
Pasadena		−2·7	85·8	53	i 12 20	− 4	i 22 35	−13	e 39·0	—
Mount Wilson	E.	−2·7	86·0	53	e 12 21	− 4	—	—	—	—
Sitka		−2·7	86·1	27	—	—	i 22 39	−12	e 35·5	—
Calcutta		−2·7	86·3	294	14 15	?	19 25	?	24·4	—
Riverside		−2·7	86·4	53	e 12 27	0	e 22 41	−13	—	—
Irkutsk		−2·7	86·7	326	12 25	− 3	—	—	39·2	—
Haiwee		−2·7	86·7	51	i 12 26	− 2	—	—	e 38·5	—
Tinemaha		−2·7	86·8	50	i 12 26	− 3	e 22 53	− 6	e 38·5	—
Victoria	E.	−2·7	87·9	38	13 29	+55	(22 54)	−16	42·8	43·4
Colombo		−2·8	89·8	277	12 44	+ 1	22 56	[−35]	—	—
Tucson		−2·8	90·9	56	12 49	+ 1	e 23 34	− 4	e 36·2	—
Hyderabad		−2·8	93·9	287	13 2	− 1	23 20	[−35]	39·8	53·3
Bozeman		−2·8	94·8	44	—	—	e 23 29	[−31]	—	—
Agra	E.	−2·8	96·7	296	13 23	+ 8	17 31	PP	—	—
Bombay		−2·9	99·5	287	13 25	− 3	23 53	[−30]	—	—

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Almata		−2·9	100·9	312	e 14 28	+54	i 24 0	[−30]	—	—
Andijan		−2·9	103·9	309	e 14 33	+45	e 24 12	[−33]	—	—
Tchimkent		—	106·1	310	e 14 23	?	—	—	—	—
Tashkent		—	106·3	309	e 16 17	?	i 24 27	[−29]	—	57·2
Florissant		—	108·5	54	i 18 39	PP	i 24 34	[−32]	—	58·7
Chicago		—	110·8	50	e 28 20?	PS	e 34 21?	SS	e 48·3?	—
Huancayo		—	111·9	110	i 18 59	PP	e 28 44	PS	53·3	—
Ekaterinburg		—	112·0	325	e 14 55	?	i 24 49	[−33]	45·2	60·2
Tananarive		—	112·1	242	e 14 26	−15	e 25 30	{−52}	52·2	61·6
La Paz	E.	—	116·4	118	e 18 32	[− 4]	i 29 25	PS	57·2	65·7
Toronto	E.	—	116·8	48	i 20 43	?	i 24 59	[−41]	50·2	—
Charlottesville		—	117·8	55	e 30 8	PS	—	—	—	—
Ottawa		—	119·2	46	—	—	e 25 20	[−28]	e 51·2	—
Baku		—	120·9	309	e 19 27	PP	i 30 23	PS	e 51·2	—
Cape Town		—	122·9	210	20 21	PP	29 2	PS	51·5	—
Harvard		—	123·0	49	—	—	e 37 14?	SS	e 57·7	—
Kucino		—	124·4	328	i 20 53	PP	e 35 51	SS	e 57·1	73·1
Tiflis		—	124·4	311	e 18 50	[− 6]	e 25 37	[−27]	e 51·2	65·9
Pulkovo		—	125·8	335	e 18 44	[−15]	i 25 34	[−33]	56·2	72·2
Helsingfors		—	127·6	338	i 22 36	?	—	—	e 58·6	—
San Juan		—	128·5	78	e 18 59	[− 5]	—	—	53·2	—
Theodosia		—	130·2	317	18 55	[−12]	—	—	—	—
Upsala		—	130·3	341	e 22 3	PKS	—	—	e 72·2	—
Yalta		—	131·2	316	18 57	[−12]	—	—	—	—
Sebastopol		—	131·5	317	e 22 38	PKS	—	—	—	—
Kaara		—	132·9	301	e 19 2	[−10]	28 8	{−32}	—	—
Copenhagen		—	135·2	341	19 3	[−12]	22 15	PP	—	—
Helwan		—	137·5	297	i 21 55	PP	—	—	—	—
Hamburg	Z.	—	137·8	341	e 19 6	[−13]	—	—	—	—
Potsdam	Z.	—	137·8	337	i 22 26	PP	—	—	e 66·2	83·2
Budapest		—	138·6	328	e 19 14?	[− 6]	(e 23 14?)	PKS	e 23·2	—
Vienna		—	139·4	330	e 19 7	[−13]	—	—	—	—
Cheb		—	139·8	335	e 22 14?	PP	e 40 14?	SS	e 62·2	66·2
De Bilt		—	140·6	343	e 19 14?	[− 8]	e 22 39	PP	e 66·2	—
Zagreb	Z.	—	141·3	327	e 19 8	[−15]	e 22 38	PP	—	—
Uccle		—	141·9	344	e 19 11	[−13]	—	—	e 61·2	—
Stuttgart		—	142·1	336	e 19 10	[−14]	28 59	{−37}	e 64·2	—
Triest		—	142·5	330	19 10	[−15]	i 29 2	{−37}	—	67·2
Strasbourg		—	142·8	338	i 19 8	[−18]	(e 28 14?)	?	e 28·2	—
Treviso		—	143·3	331	i 19 13	[−15]	29 9	{−34}	—	—
Venice		—	143·4	331	i 19 13	[−16]	e 28 57	{−47}	—	—
Zurich		—	143·5	336	e 19 11	[−18]	—	—	—	—
Chur		—	143·6	336	e 19 12	[−17]	—	—	—	—
Paris		—	144·3	343	e 11 14?	?	—	—	—	—
Neuchatel		—	144·4	337	e 19 13	[−19]	i 23 0	PKS	—	—
Besançon		—	144·5	337	19 19	[−13]	—	—	—	—
Camerino		—	144·6	328	19 11	[−22]	—	—	—	—
Pavia		—	144·6	334	e 18 16	[−77]	—	—	—	—
Piacenza	Z.	—	144·8	334	19 26	[− 7]	—	—	—	—
Prato		—	145·1	330	i 19 18	[−16]	i 29 19	{−35}	—	—
Florence		—	145·1	330	i 19 22	[−12]	23 14	PKS	—	—
Trenta		—	145·2	320	e 19 9	[−25]	—	—	—	—
Naples	E.	—	145·5	324	e 19 30	[− 5]	e 22 40	PP	—	—
Livorno		—	145·7	330	19 19	[−16]	—	—	—	—
Puy de Dôme		—	146·9	340	19 24?	[−13]	—	—	—	—
Catania		—	147·1	318	19 26	[−11]	—	—	—	—
Marseilles		—	148·1	335	i 19 36	[− 3]	—	—	—	—
Toledo		—	154·3	346	e 19 33	[−14]	e 30 9	{−38}	—	—
Algiers		—	154·6	330	—	—	(38 14?)	?	38·2	—
Alicante		—	154·6	338	e 19 43	[− 5]	e 30 11	{−38}	e 44·0	—
Almeria		—	156·7	340	—	—	e 32 3	?	e 37·4	—
Granada		—	156·7	342	i 19 35a	[−15]	31 56	?	—	—
Malaga		—	157·4	344	19 39	[−11]	30 22	{−42}	67·0	80·4
Dakar		—	174·9	95	19 58	[− 8]	—	—	—	—

For Notes see next page.

NOTES TO JANUARY 1d. 8h. 48m. 46s.

Additional readings and notes :—

Suva i = +1m.50s.
Riverview iPP = +5m.33s., P_cP = +8m.37s.
Wellington PP = +6m.24s., PPP = +6m.39s., i = +11m.19s., SS = +12m.28s.
Melbourne PP = +6m.44s., i = +8m.51s.
Adelaide iPP = +7m.6s., i = +8m.10s. and +12m.32s.
Amboina i = +8m.8s.
Honolulu T.H. ePP = +11m.1s., e = +15m.14s., SS = +19m.56s.
Perth e = +8m.44s.
Sumoto PN = +9m.41s.
Osaka i = +10m.9s. and +14m.30s.
Koti eS = +10m.8s., giving the resemblance to a local shock.
Kobe eSN = +18m.27s., iN = +19m.15s. = S_cS − 28s.
Batavia iP = +9m.52s.
Taikyu S_cSN? = +19m.32s.
Zi-ka-wei iZ = +10m.40s., +10m.46s., +13m.2s., +19m.10s., +19m.58s., and +24m.46s.
Hong Kong ? = +10m.52s., +19m.36s. = PS +13s., and +26m.45s.
Zinsen P_cPZ = +10m.43s., S_cS = +19m.48s.
Nanking iPPEZ = +11m.5s. = P_cP − 14s.
Heizyo iP_cPE = +11m.47s., S_cSE? = +20m.14s.
Medan iS = +21m.2s., i = +22m.1s.
Chiufeng iPP = +11m.43s., iPPP? = +11m.59s., i = +14m.16s. and +15m.4s.
Ukiah e = +28m.56s. and +35m.2s.
Berkeley eN = +9m.26s.
Pasadena iEZ = +12m.25s., iZ = +13m.1s. and +13m.26s., iEZ = +23m.49s. = PS − 12s., eZ = +24m.28s.
Irkutsk ePP = +15m.27s., e = +18m.56s. = PPPP +15s., PS = +22m.38s., eSS = +27m.2s.
Haiwee iZ = +12m.30s.
Tinemaha i = +12m.31s.
Victoria gives S as L and the true L and M as for a separate shock.
Tucson eSKS = +23m.0s., ePS = +24m.44s., eSS = +29m.48s.
Bozeman e = +30m.2s. = SS − 7s.
Tashkent e = +16m.50s. and +20m.15s. = PPP − 24s.
Florissant eE = +28m.35s. = PS + 22s.
Ekaterinburg e = +18m.37s., iPP = +19m.28s., iSKKS = +26m.6s., i = +26m.50s. and +28m.15s., iPS = +28m.58s.
Tananarive ePKPN = +17m.18s., ePPN = +19m.0s., ePSE = +28m.37s., e = +29m.15s. and +31m.14s.?, SSE = +34m.48s., SSN = +34m.54s.
La Paz iE = +19m.45s. = PP + 2s., ipPE = +20m.19s., iSN = +29m.31s., iPSE = +30m.19s., isSN = +31m.5s., SSE = +35m.43s., SSN = +35m.59s., SSSE = +38m.51s.
Toronto iE = +29m.51s., iN = +36m.33s.
Ottawa eE = +26m.27s., +29m.32s., and +36m.14s. = SS − 7s., eN = +39m.44s., eE = +45m.44s.
Baku i = +20m.40s.
Cape Town +21m.47s., +30m.32s., +31m.2s., +35m.17s., +36m.47s., +38m.32s., +40m.52s., and +42m.14s.
Tiflis ePPE = +20m.30s., ePPN = +21m.0s., ePPPE = +23m.47s., eSKKSE = +27m.12s., PSE = +30m.52s., PSSE = +38m.2s., SSSE = +42m.56s., eE = +45m.36s.
Pulkovo PP = +21m.6s., i = +21m.25s., e = +27m.15s. = SKKS − 40s., i = +30m.22s. = SKSP − 18s., e = +30m.46s. = PS − 8s., +31m.0s., +32m.51s., and +35m.57s.
Helsingfors eSKSEN = +29m.52s., eSKKSEN = +31m.16s., eSKSPEN = +34m.20s., ePPPEN = +39m.11s.
San Juan iPP = +20m.59s., i = +22m.10s., e = +28m.56s., eSS = +37m.56s.
Theodosia PP = +21m.37s.
Upsala i = +22m.12s., e = +22m.49s.
Ksara SKP = +22m.19s.
Copenhagen e = +23m.11s.
Hamburg eZ = +22m.27s. and +23m.33s.
Potsdam eEN = +22m.32s.
Vienna iPZ = +19m.11s., iL = +22m.34s., i = +22m.43s.
Zagreb eP = +19m.11s., eNW = +19m.30s., +19m.52s., and +21m.39s.
Uccle i = +22m.39s. and +23m.45s., e = +33m.2s.
Stuttgart $ePKP_2Z$? = +19m.45s., ePP = +22m.41s., ePKSZ = +23m.7s., eZ = +23m.44s., eSKSZ = +26m.49s., eSSEN = +41m.50s.
Triest e = +22m.40s., i = +22m.52s.
Strasbourg ePP = +22m.30s., iSKP = +22m.56s.
Treviso PP = +19m.18s., PPP = +19m.54s.
Zurich i = +19m.16s.
Chur i = +19m.23s.
Toledo i = +19m.45s. and +19m.54s., PKP = +22m.9s., PP = +23m.41s., PS = +34m.9s.
Granada PKS = +23m.50s., SKS = +27m.17s., SKSP = +35m.55s.
Malaga PKP_2 = +20m.22s., PP = +24m.1s., PSKS = +37m.24s., SS = +44m.37s.
Long waves were also recorded at St. Louis, Kew, and San Fernando.

Jan. 1d. Readings also at 1h. (Almeria, Berkeley (2), and Lick), 5h. (Berkeley and Lick), 6h. (Berkeley and Lick), 7h. (Christchurch, New Plymouth, Kobe, and near Tyosi), 8h. (Irkutsk, Kobe, Tyosi, and near Athens), 9h. (Andijan, Tashkent, and near Almata), 10h. (Haiwee, Pasadena, Tinemaha, Mizusawa, Andijan, Ekaterinburg, near Almata, and near Tchimkent), 11h. (Wellington and New Plymouth), 13h. (Perth), 14h. (Andijan and Tucson), 16h. (near La Paz), 19h. (near Calcutta), 21h. (Andijan, Alicante, Marseilles, and near Tyosi), 22h. (near Tyosi).

Jan. 2d. 7h. 56m. 52s. Epicentre 41°·5N. 23°·0E. N.3.

$A = +\cdot689$, $B = +\cdot293$, $C = +\cdot663$; $D = +\cdot391$, $E = -\cdot921$; $G = +\cdot610$, $H = +\cdot259$, $K = -\cdot749$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·6	170	e 1 5	P_g	e 2 8	S_g	2·3	3·2
Belgrade	3·8	332	e 1 5	P*	2 7	S_g	—	2·5
Budapest	6·6	336	e 3 8?	S*	—	—	4·1	—
Zagreb	6·7	312	e 2 16	P*	e 3 25	S*	—	3·7
Triest	7·9	305	e 2 34	P*	—	—	—	5·2
Vienna	8·2	328	i 1 56	0	—	—	—	6·1
Venice	8·7	300	4 44	S_g	—	—	—	—
Yalta	8·7	66	1 59	− 4	—	—	—	—
Theodosia	9·6	64	e 2 12	− 4	3 46	−17	—	—
Pulkovo	18·8	12	i 4 17	+ 1	—	—	10·1	—
Ekaterinburg	28·4	45	e 5 50	− 1	—	—	14·6	—

Additional readings:—
Belgrade e = +1m.13s. = P_g +3s., +1m.20s., and +1m.24s.
Triest iSS = +4m.39s.
Ekaterinburg i = +5m.57s.

Jan. 2d. Readings also at 2h. (Zagreb and near Triest), 3h. (Berkeley, Branner, Lick, San Francisco, Ukiah, and Tucson), 4h. (Tiflis), 5h. (La Paz), 9h. (Lick), 12h. (Berkeley, Lick, and San Francisco), 13h. (Andijan and Ksara), 14h. (near Manila), 15h. (Berkeley (2), Lick (2), and Branner), 17h. (Berkeley (2), Branner (2), Lick (2), Tucson, Almata, Tchimkent, Baku, Ekaterinburg, near Andijan, and Tashkent), 23h. (near La Paz).

Jan. 3d. 15h. 26m. 54s. Epicentre 40°·7N. 145°·8E. (as on 1931 May 14d.). R.1.

Probable error of the epicentre ±0°·30.

Tokyo gives 40°·4N. 144°·0E., shallow focus.

$A = -\cdot627$, $B = +\cdot426$, $C = +\cdot652$; $D = +\cdot562$, $E = +\cdot827$; $G = -\cdot539$, $H = +\cdot367$, $K = -\cdot758$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Nemuro	2·6	356	0 54	P_g	1 42	S_g	—	—
Morioka	3·7	256	0 47	− 6	1 12	P_g	—	—
Aomori	3·8	274	0 47	− 7	1 18	P_g	—	—
Mizusawa	3·9	247	i 0 52	− 4	i 1 31	− 9	—	—
Muroran	4·0	295	0 55	− 2	1 39	− 3	—	—
Sapporo	4·1	307	0 58	0	1 43	− 2	—	—
Akita	4·5	259	0 57	− 7	1 46	− 9	—	—
Sendai	4·6	239	1 2	− 4	1 45	−13	—	—
Hukusima	5·1	236	1 12	− 1	2 11	+ 1	—	—
Mito	6·0	226	1 26	+ 1	2 32	− 1	—	—
Kakioka	6·3	226	1 29	− 1	2 31	−10	—	—
Tyosi	6·3	219	e 1 39	+ 9	2 26	−15	2·9	3·7
Tukubasan	6·4	227	1 32	+ 1	2 30	−13	—	—
Kumagaya	6·8	230	1 36	− 1	3 1	+ 8	—	—
Maebasi	6·8	233	1 37	0	2 54	+ 1	—	—
Tokyo	6·9	226	1 41	+ 3	2 50	− 6	—	—
Nagano	7·2	238	1 41	− 1	3 10	+ 6	—	—
Yokohama	7·2	225	1 46	+ 4	2 54	−10	—	—
Mera	7·3	221	1 53	+ 9	3 45	S*	—	—
Hunatu	7·6	229	1 48	0	3 20	+ 6	—	—

Continued on next page.

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Kohu		7·6	231	1 48	0	3 31	+17	—	—
Wazima		7·7	247	1 46	− 3	3 12	− 4	—	—
Misima		7·8	226	1 54	+ 3	3 25	+ 6	—	—
Gihu		8·9	236	2 5	− 1	3 46	0	—	—
Nagoya		8·9	234	e 2 18	+12	4 14	S*	—	4·3
Hatidyozima		9·0	214	2 17	+10	4 21	S*	—	—
Hikone		9·3	237	2 7	− 4	3 50	− 6	—	—
Kameyama		9·4	234	2 20	+ 7	4 4	+ 5	—	—
Toyooka	E.	10·0	243	i 1 17	−64	i 3 12	−61	i 4·1	5·4
	N.	10·0	243	i 1 30	−51	i 3 9	−64	i 4·1	—
	Z.	10·0	243	i 1 19	−62	i 3 15	−58	—	5·5
Osaka		10·2	237	2 30	+ 6	4 25	+ 7	—	5·7
Kobe		10·3	238	i 2 35	+10	4 18	− 3	5·2	6·2
Wakayama		10·6	236	2 35	+ 6	5 15	S*	—	—
Sumoto	E.	10·7	237	e 2 38	+ 7	e 4 27	− 4	—	5·3
	N.	10·7	237	e 2 34	+ 3	4 32	+ 1	—	5·7
Siomisaki		10·8	231	2 45	+13	4 55	+22	—	—
Koti		12·1	238	e 1 43	−67	—	—	e 4·1	5·6
Hukuoka		14·2	245	3 17	− 1	e 6 6	+10	—	8·7
Hukuoka B.		14·2	245	3 20	+ 2	6 35	+39	—	—
Taikyu		14·3	256	3 17	− 2	e 5 46	−12	6·6	—
Kumamoto		14·4	242	3 21	0	6 19	+18	—	—
Miyazaki		14·5	237	3 12	−10	5 48	−15	—	—
Keizyo		14·9	264	3 21	− 6	—	—	6·8	9·2
Nagasaki		15·0	243	e 3 11	−17	e 5 36	−39	9·3	9·6
Zinsen	E.	15·2	264	e 3 22	− 9	e 5 32	−48	e 6·8	—
Heizyo	E.	15·4	270	3 25	− 9	—	—	7·3	—
Naha		20·9	232	5 1	+22	8 31	+ 7	—	—
Zi-ka-wei	Z.	21·8	252	e 4 44	− 5	8 44	+ 2	11·9	13·5
Chiufeng		22·5	278	i 4 51a	− 5	8 52	− 3	11·1	14·6
Nanking		23·3	257	e 5 1	− 3	e 8 56	−14	11·7	14·5
Irkutsk		30·3	308	6 12	+ 4	e 10 54	−15	16·1	—
Hong Kong		32·3	244	6 25	0	11 30	−10	15·4	24·0
Manila		33·9	227	7 51	PP	12 6	+ 2	14·6	—
Phu-Lien		38·7	251	e 7 22	+ 1	—	—	20·1	—
Almata		49·7	297	e 9 8	+19	—	—	27·1	—
Calcutta		51·2	269	e 6 10	?	14 39	?	27·9	—
Andijan		53·9	296	e 9 6	−15	17 33	+39	29·4	—
Ekaterinburg		54·5	319	i 9 35	+10	i 17 6	+ 4	28·4	34·9
Tchimkent		55·1	299	e 9 35	+ 5	—	—	30·1	—
Tashkent		55·7	299	—	—	e 18 50	+91	—	—
Medan		56·2	242	—	—	e 17 12	−13	30·4	—
Agra	E.	56·5	278	9 51	+12	17 26	− 4	e 29·2	35·2
Batavia		59·0	227	e 10 32	(−18)	17 59	− 4	—	—
Hyderabad		61·7	272	10 20	+ 4	18 44	+ 6	33·9	45·7
Bombay		65·1	275	10 44	+ 5	19 15	− 6	—	41·9
Pulkovo		66·5	330	e 11 4	+15	e 19 48	+ 9	36·1	39·2
Helsingfors		68·1	333	e 6 7	?	—	—	e 25·2	—
Baku		68·7	306	e 11 13	+10	e 20 19	+14	34·2	43·5
Tiflis		71·0	310	e 11 21	+ 4	e 20 30	− 3	38·1	45·0
Ksara		81·5	309	e 12 11	− 5	22 30	− 2	—	—
Little Rock	E.	87·5	44	e 4 17	?	e 23 49	+17	—	—
La Paz	E.	142·0	60	e 21 8	?	—	—	72·1	—

Additional readings and notes :—
Tyosi P_g = +1m.56s.
Osaka i = +4m.45s. =S* −16s.
Kobe iE = +3m.5s., iN = +3m.8s., eSN = +4m.22s.
Sumoto P = +2m.42s.
Chiufeng iPP? = +5m.17s.
Tiflis ePN = +11m.25s., P_cPE = +11m.58s., eE = +20m.50s. =PS −2s., eSSE = +25m.6s.
Long waves were also recorded at Wellington, Huancayo, San Juan, Sitka, Harvard, East Machias, Kucino, Theodosia, Yalta, and many European stations.

Jan. 3d. 22h. 40m. 59s. Epicentre 38°·8N. 138°·4E. N.3.

A = −·583, B = +·517, C = +·627; D = +·664, E = +·748;
G = −·469, H = +·416, K = −·779.

A *depth* of focus 0·040 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
			°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		+0·9	2·1	81	0 39	− 4	1 5	−12	—	—
Tyosi		+0·4	3·7	147	e 1 38	S	(e 1 38)	− 7	—	—
Nagoya		+0·4	3·8	197	e 1 3	+ 3	2 29	+41	—	—
Osaka		+0·1	4·7	210	1 38	+30	2 50	+47	—	4·8
Kobe		+0·1	4·9	213	—	—	i 2 54	+46	—	—
Sumoto		+0·1	5·3	212	e 2 56	S	—	—	—	—
Keizyo		−0·4	9·1	266	2 4	+ 1	3 42	+ 1	—	—
Zinsen		−0·5	9·4	266	2 7	+ 1	3 48	+ 2	—	—
Chiufeng		−1·3	17·2	281	e 3 30k	−10	—	—	i 6·4	—
Nanking	N.	−1·3	17·3	253	3 41	0	e 6 50	+12	—	—
Tinemaha	Z.	−5·0	76·4	52	i 11 20	+ 1	—	—	—	—
Haiwee	E.	−5·0	77·2	53	e 11 24	0	—	—	—	—
Pasadena	Z.	−5·1	78·4	55	i 11 29	− 2	—	—	—	—

Mizusawa gives SE = +1m.45s.
Tyosi S = +2m.23s.

Jan. 3d. Readings also at 6h. (near Tananarive), 8h. (Berkeley), 10h. (Berkeley, La Paz, La Plata, and near Athens), 11h. (Huancayo), 12h. (near Ksara), 13h. (Lick and near Manila), 14h. (Berkeley, Lick, Helsingfors, Prague, and Vienna), 15h. (Toledo and near Lick), 16h. (Phu-Lien), 17h. (near Batavia, Malabar, and Soengei Langka), 21h. (Lick and near Baku), 22h. (Lick).

1933 Jan. 4d. 1h. 24m. 53s. Epicentre 25°·9N. 144°·0E. N.1.

Probable error of epicentre ±0°·20.

A = −·728, B = +·529, C = +·437; D = +·588, E = +·809;
G = −·353, H = +·257, K = −·900.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Titizima	2·0	306	0 30	+ 1	0 56	S*	—	—
Hatidyozima	8·0	334	1 55	+ 2	3 19	− 5	—	—
Mera	9·7	339	2 10	− 7	3 58	− 8	—	—
Omaesaki	10·0	332	2 14	− 7	4 2	−11	—	—
Misima	10·2	336	2 21	− 3	4 8	−10	—	—
Numadu	10·2	336	2 24	0	4 13	− 5	—	—
Tyosi	10·2	346	e 2 25	+ 1	4 6	−12	—	4·2
Yokohama	10·3	340	2 22	− 3	4 10	−11	—	—
Hamamatu	10·4	330	2 33	+ 7	4 18	− 5	—	—
Siomisaki	10·4	319	2 28	+ 2	4 21	− 2	—	—
Tokyo	10·4	341	2 24	− 2	4 18	− 5	—	—
Hunatu	10·6	336	2 41	+12	4 35	+ 7	—	—
Kakioka	10·8	343	2 31	− 1	4 20	−13	—	—
Kohu	10·8	335	2 32	0	4 25	− 8	—	—
Mito	10·9	345	2 28	− 5	4 24	−12	—	—
Kameyama	11·0	326	2 35	0	4 37	− 1	—	—
Kumagaya	11·0	340	2 30	− 5	4 26	−12	—	—
Nagoya	11·0	329	e 2 39	+ 4	4 29	− 9	—	—
Gihu	11·3	328	2 36	− 3	4 40	− 5	—	—
Maebasi	11·3	339	2 37	− 2	4 37	− 8	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Osaka		11·4	322	2 30	−10	4 57	+ 9	—	4·7
Hikone		11·5	326	2 41	− 1	4 49	− 1	—	—
Kyoto		11·5	324	2 43	+ 1	4 53	+ 3	—	—
Sumoto		11·5	319	2 44	+ 2	5 36	S*	7·1	10·5
Kobe		11·6	321	2 45	+ 2	i 4 54	+ 1	i 5·2	8·3
Nagano		11·8	336	2 46	0	4 50	− 8	—	—
Simidu		11·8	309	2 46	0	5 47	S*	—	—
Koti		11·9	313	e 2 47	0	—	—	5·2	—
Hukusima		12·2	347	2 47	− 4	4 55	−13	—	—
Toyooka		12·4	323	e 2 50	− 4	i 5 12	− 1	e 6·2	—
Miyazaki		12·5	302	3 0	+ 5	5 46	+31	—	—
Sendai		12·6	350	2 53	− 3	4 53	−24	—	—
Wazima		13·0	334	3 2	0	5 20	− 7	—	—
Mizusawa	E.	13·4	350	i 3 6	− 1	i 5 21	−16	—	—
	N.	13·4	350	e 3 13	+ 6	i 5 23	−14	—	—
Kumamoto		13·5	304	3 12	+ 3	5 57	SS	—	—
Hamada		13·6	314	3 12	+ 2	5 46	+ 5	—	—
Morioka		14·0	351	3 11	− 4	5 36	−15	—	—
Hukuoka		14·0	307	e 3 11	− 4	—	—	—	—
Hukuoka B.		14·0	307	3 22	+ 7	7 29	L	(7·5)	—
Nagasaki		14·1	303	i 3 19	+ 2	e 6 6	SS	—	6·5
Akita		14·2	348	3 20	+ 2	5 45	−11	—	—
Naha		14·7	275	3 33	+ 8	—	—	—	—
Tomie		14·9	301	3 30	+ 3	8 20	L	(8·3)	—
Sapporo		17·3	354	4 1	+ 3	6 12	−57	—	—
Isigakizima		18·0	269	4 8	+ 1	7 36	+11	—	—
Keizyo		18·5	313	4 12	− 1	7 37	+ 1	e 10·0	—
Zinsen		18·7	313	4 14	− 1	7 46	+ 6	e 10·1	—
Heizyo		20·2	315	e 4 29	− 3	8 26	SS	e 10·8	—
Taihoku		20·3	273	e 4 36	+ 3	8 25	+13	—	—
Zi-ka-wei		20·5	291	4 40	+ 5	8 20	+ 4	11·7	13·9
Ootomari		20·8	358	e 4 38	0	(8 30)	+ 8	8·5	8·7
Nanking		22·8	292	i 4 59a	0	i 9 6	+ 5	e 13·5	15·2
Manila		24·3	247	e 5 11	− 2	9 26	− 2	—	—
Chiufeng		27·1	309	5 36k	− 3	i 10 30	+13	14·2	—
Hong Kong		27·3	269	5 39	− 2	10 17	− 3	12·6	20·3
Phu-Lien		34·5	270	e 6 46	+ 1	12 10	− 4	—	—
Batavia		48·2	234	8 36	− 2	i 15 30	− 6	—	—
Medan		48·7	252	e 8 43	+ 2	i 15 44	+ 1	27·1	—
Honolulu T.H.		53·1	82	e 9 27	+12	e 16 27	−16	24·4	—
Almata		56·3	307	e 9 40	+ 2	—	—	—	—
Andijan		60·0	304	10 4	0	i 18 20	+ 4	33·1	—
Riverview		60·1	173	e 10 7	+ 2	i 18 8	− 9	e 28·1	34·5
Sydney		60·1	173	—	—	i 17 43	−34	28·1	36·8
Hyderabad		60·9	276	10 12	+ 1	18 27	− 1	31·9	40·9
Adelaide		61·1	185	i 10 47	(−11)	i 18 20	−10	i 29·4	35·1
Tchimkent		61·8	306	i 10 22	+ 5	18 43	+ 4	37·1	—
Tashkent		62·2	305	—	—	i 19 44	+59	32·1	42·0
Sitka		63·5	36	—	—	i 19 5	+ 4	e 30·5	—
Melbourne		63·7	179	—	—	i 18 54	−10	28·8	31·7
Perth		63·7	207	e 10 27	− 3	i 18 57	− 7	—	—
Ekaterinburg		65·0	323	i 10 34	− 5	i 19 19	− 1	33·1	40·1
Bombay		65·4	280	10 40	− 1	19 22	− 3	34·0	—
Victoria	E.	72·6	44	20 50	S	(20 50)	− 2	33·4	34·0
Wellington		73·0	157	i 10 44	−45	—	—	36·1	—
Ukiah		76·0	53	—	—	e 21 22	−10	e 34·7	—
Baku		76·5	309	11 50	+ 1	21 34	− 3	37·1	—
Berkeley		77·2	54	e 11 49	− 4	—	—	—	—
Lick		77·8	54	e 11 55	− 2	—	—	—	—
Pulkovo		78·7	332	11 58	− 3	22 11	+ 9	41·1	50·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis		79·5	312	12 1	− 4	22 3	− 7	37·1	44·7
Santa Barbara	N.	80·4	56	i 12 7	− 3	—	—	—	—
Tinemaha		80·4	53	e 12 6	− 4	—	—	—	—
Helsingfors	E.	80·7	335	i 11 50	−22	e 21 57	−26	e 35·4	—
Hawaii		81·0	54	i 12 12	− 1	—	—	—	—
Bozeman		81·3	43	—	—	e 22 16	−14	e 40·1	—
Pasadena		81·7	56	i 12 14	− 3	i 22 38	+ 4	e 37·2	—
Mount Wilson		81·8	56	i 12 15	− 2	—	—	—	—
Riverside		82·4	56	e 12 17	− 3	—	—	—	—
Theodosia		83·9	318	e 12 27	− 1	e 22 52	− 4	57·1	—
Simferopol		84·8	318	e 12 31	− 1	—	—	—	—
Yalta		84·9	317	e 12 32	− 1	23 16	+ 9	—	—
Tucson		88·0	55	12 51	+ 3	e 23 32	− 5	e 39·6	—
Copenhagen		88·6	335	12 49	− 2	—	—	47·1	—
Ksara		89·4	307	e 12 53	− 2	23 46	− 4	—	—
Vienna	Z.	92·3	328	13 4	− 4	—	—	—	—
Cheb		92·8	331	—	—	e 25 7?	PS	e 47·1	61·1
Zagreb		94·3	327	e 13 12	− 5	—	—	—	—
Madison		95·4	36	i 13 20	− 2	e 24 5	[+ 2]	—	51·8
Triest		95·4	328	e 17 13	PP	—	—	e 51·1	—
Chur		96·5	332	e 13 24	− 3	e 17 20	PP	—	—
Florissant		97·7	40	i 13 31	− 2	e 24 14	[− 1]	—	48·6
St. Louis		97·8	40	e 13 30	− 3	i 24 20	[+ 5]	—	56·2
Florence		97·9	327	e 24 7	SKS	(e 24 7)	[− 9]	47·1	50·1
Little Rock		99·2	44	e 13 36	− 4	e 24 29	[+ 7]	—	—
Toronto		99·8	30	e 17 37	PP	i 24 30	[+ 5]	45·3	—
Ottawa		100·1	27	—	—	e 24 32	[+ 6]	e 49·1	—
Harvard		104·4	26	—	—	e 24 37	[−10]	e 50·5	—
Fordham		104·5	29	e 18 22	PP	e 25 1	[+14]	e 50·6	—
San Juan		126·9	37	—	—	e 30 53	PS	e 63·8	—
Cape Town		132·7	246	e 19 10	[− 1]	—	—	—	—
Huancayo		140·6	77	i 23 4	PKS	e 41 1	SS	—	—
La Paz		148·7	79	19 45k	[+ 5]	i 30 17	{+ 2}	76·8	88·9

Additional readings and note :—
Tyosi P = +2m.31s.
Osaka i = +2m.49s. and +3m.27s.; epicentre 25°·8N. 145°·0E.
Toyooka ePE = +2m.53s.
Keizyo i = +4m.15s., PP = +4m.28s., PPP = +4m.36s., iE = +8m.0s. =S −10s., +8m.14s. and +8m.27s.
Zinsen i = +4m.17s., PPEN = +4m.24s.
Zi-ka-wei PPZ = +4m.56s., iZ = +5m.44s., SSZ = +8m.42s.
Nanking iN = +10m.24s.
Manila iEN = +10m.16s. =SS +4s., iEN = +12m.49s.
Hong Kong PP = +5m.59s.
Batavia P = +8m.43s.
Medan i = +15m.37s.
Riverview i = +19m.7s. and +19m.51s. =S_cS −2s.
Melbourne i = +26m.16s.
Pulkovo SS = +27m.19s.
Tiflis P_cPEN = +12m.24s., ePSEN = +22m.20s., eSSN = +27m.35s., eSSSN = 31m.2s.
Helsingfors eP_cPE = +12m.20s., ePPE = +14m.57s., ePPPE = +16m.55s., eSSE = +27m.7s., eSSSN = +30m.25s., eSSSE = +31m.7s.
Bozeman e = +31m.7s.
Tucson e = +23m.37s.
Ksara SSE = +29m.44s.
Zagreb e = +16m.43s. =PP −16s.
Madison e = +24m.50s. =S +4s.
Florissant e = +26m.27s., eE = +31m.47s.
Florence S = +31m.37s.
Little Rock iE = +17m.40s. =PP +3s.
Toronto e = +32m.15s. =SS +16s.
Ottawa e = +32m.25s. =SS +22s.
Harvard e = +33m.7s.? =SS +5s.
Fordham e = +27m.47s. =PS +14s.
Cape Town ePP = +21m.35s.?, i = +22m.19s. and +22m.38s., iPKS = +22m.44s., iPPP = +24m.29s., eSS = +39m.49s.?
La Paz $iPKP_2N$ = +20m.27s., $sPKP_2E$ = +20m.47s.
Long waves were also recorded at Ivigtut, Seattle, East Machias, and other European stations.

Jan. 4d. 3h. 59m. 35s. Epicentre 61°·0N. 149°·0W. (as on 1932 Sept. 14d.). R.1.

Probable error of epicentre ±0°·32.

A = −·416, B = −·250, C = +·875; D = −·515, E = +·857;
G = −·750, H = −·450, K = −·485.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		8·0	113	i 1 44	− 9	—	—	3·9	—
Seattle		20·2	119	e 4 37	+ 5	8 23	+13	e 10·9	—
Spokane		22·3	112	e 4 54	0	8 55	+ 3	—	—
Saskatoon		24·4	92	5 5	− 9	9 21	− 9	—	—
Bozeman		26·8	107	e 5 35	− 1	e 10 9	− 3	e 12·7	—
Ukiah		27·0	132	e 5 45	+ 7	e 10 15	0	12·5	—
Berkeley		28·5	132	e 5 37	−15	—	—	—	—
Branner	N.	28·9	132	e 6 7	+12	—	—	—	—
Lick		29·2	132	e 5 55	− 3	—	—	—	—
Tinemaha		30·7	127	i 6 11	0	i 11 11	− 5	—	—
Haiwee		31·6	128	i 6 19	0	e 11 25	− 4	—	—
Santa Barbara		32·5	132	e 6 27	0	—	—	—	—
Mount Wilson		33·3	131	e 6 32	− 2	e 11 50	− 5	—	—
Pasadena		33·4	131	e 6 31	− 4	i 11 49	− 8	e 15·9	—
Riverside		33·8	129	e 6 34	− 5	i 11 55	− 8	—	—
Denver		34·2	109	—	—	e 11 55	−14	—	18·1
Tucson		37·9	123	e 7 14	0	e 12 58	− 7	e 17·4	—
Madison		39·1	90	i 7 22	− 2	i 13 16	− 6	18·4	—
		39·1	90	i 7 35	+11	i 13 29	+ 7	—	—
Chicago		40·9	89	e 9 7	PP	e 13 43	− 7	e 20·4	—
Florissant		41·8	95	i 7 43	− 4	i 13 54	− 9	—	i 21·4
St. Louis		42·1	95	e 7 44	− 5	e 14 4	− 4	i 21·9	24·4
Ann Arbor		42·4	85	e 8 1	+ 9	e 14 19	+ 8	e 19·9	22·8
Toronto		43·5	82	e 7 56	− 5	i 14 17	−11	20·4	—
Ottawa		43·9	77	e 8 1	− 3	e 14 28	− 6	e 20·4	—
Little Rock		44·1	101	e 8 0	− 6	i 14 45	+ 8	i 22·9	—
Buffalo		44·3	82	i 8 5	− 2	i 14 35	− 5	18·4	—
Pittsburgh		45·6	84	i 8 26	+ 8	i 15 6	+ 7	i 20·7	—
Mizusawa	E.	47·1	276	(8 50)	+21	8 50	P	—	—
Sendai		47·9	275	8 53	+18	15 34	+ 3	—	—
Woodstock		48·0	82	8 50	+14	—	—	—	—
Charlottesville		48·2	87	e 8 43	+ 5	e 15 25	−11	e 23·6	—
Fordham		48·2	80	e 8 36	− 2	i 15 33	− 3	i 22·4	—
East Machias		48·2	72	e 8 36	− 2	i 15 33	− 3	20·3	—
Georgetown		48·2	83	i 8 36k	− 2	i 15 32	− 4	e 22·4	—
Harvard		48·4	76	e 10 13	PP	e 15 17	−21	e 20·7	—
Columbia		50·2	91	—	—	15 57	− 7	e 21·9	—
Nagoya		52·2	276	e 9 24	+16	—	—	—	—
Irkutsk		52·7	315	e 9 14	+ 2	16 44	+ 6	29·4	33·7
Osaka		53·3	278	8 56	−20	16 54	+ 8	—	17·8
Kobe		53·5	278	e 9 18	0	e 17 21	+32	—	31·2
Keizyo		55·0	286	9 27	− 2	17 15	+ 6	—	—
Zinsen		55·3	287	e 9 37	+ 6	17 18	+ 5	e 25·4	—
Miyazaki		57·5	279	9 53	+ 6	17 37	− 6	—	—
Chiufeng		57·9	297	9 55k	+ 5	17 45	− 3	—	—
Helsingfors		58·8	5	i 9 36	−20	e 17 17	−43	e 24·0	—
Pulkovo		59·3	1	10 0	0	—	—	30·4	—
Ekaterinburg		59·9	344	i 10 8	+ 4	—	—	27·4	37·9
Copenhagen		62·4	13	10 30	+ 9	—	—	—	—
Zi-ka-wei	Z.	62·9	287	—	—	e 22 18	SS	35·4	41·9
Nanking		63·4	290	10 29	+ 1	—	—	e 34·9	38·4
Naha		64·1	279	10 48	+15	19 12	+ 3	—	—
De Bilt		65·1	18	e 10 52	+13	—	—	e 32·4	—
Almata		69·3	327	11 9	+ 3	20 15	+ 2	40·9	—
Zurich		70·2	16	e 11 10	− 2	—	—	—	—
San Juan		70·6	87	—	—	20 33	+ 5	33·1	—

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Chur	70·8	16	e 11 14	− 2	—	—	—	—
Tchimkent	72·1	331	11 33	+10	e 20 49	+ 3	41·4	—
Zagreb	72·5	10	e 11 20	− 6	—	—	—	—
Andijan	72·8	330	11 28	0	20 55	+ 1	40·6	—
Tashkent	73·1	331	e 12 33	+64	i 21 59	+61	36·5	52·0
Hong Kong	73·8	288	20 55	S	(20 55)	−11	—	49·4
Theodosia	73·9	357	e 11 35	+ 1	e 21 8	+ 1	39·4	—
Florence	74·0	15	11 20	−15	—	—	35·4	37·9
Yalta	74·5	358	e 11 37	0	21 13	− 1	—	—
Toledo	75·2	28	e 11 39	− 2	21 19	− 3	e 34·2	—
Tiflis	76·7	350	e 11 51	+ 1	21 28	−11	e 34·4	47·2
Baku	77·5	346	11 56	+ 1	e 21 51	+ 3	36·6	52·4
Almeria	78·4	28	e 12 12	+13	—	—	—	—
Phu-Lien	78·6	293	e 12 9	+ 9	21 56	− 4	—	—
Calcutta	84·6	309	12 15	−16	22 53	[− 3]	45·2	—
Simferopol	84·8	359	e 11 38?	−54	—	—	—	—
Ksara	85·1	357	e 12 38	+ 4	23 8	− 1	—	51·4
Huancayo	92·8	110	e 13 7	− 3	23 53	[+ 4]	e 40·4	—
Bombay	93·4	321	13 9	− 4	23 13	[−39]	—	52·6
Medan	97·3	292	—	—	e 24 0	[−13]	—	—
La Paz	100·0	106	e 17 15	PP	27 45	?	50·8	58·4

Additional readings and notes :—
Sitka e = +2m.31s. = P_g − 3s.
Seattle e = +4m.45s., iPP = +4m.51s., e = +8m.30s.
Ukiah e = +5m.55s., i = +10m.53s.
Tinemaha i = +6m.22s.
Haiwee i = +6m.30s.
Santa Barbara eN = +6m.37s.
Pasadena iE = +6m.44s. and +8m.1s., eE = +11m.19s.
Riverside eEN = +6m.49s.
Tucson i = +7m.25s., e = +8m.39s. = PP +3s.
Madison iPP = +8m.51s., iPP = +9m.3s., eSS = +15m.25s.? ; T_0 = 3h.59m.56s.
the readings are given for two shocks at an interval of 13 seconds.
Chicago e = +16m.25s. = SS − 6s.
Florissant i = +7m.58s., eNZ = +9m.28s. = PP +10s., i = +9m.37s.
St. Louis iP = +7m.57s. = P_cP +8s., iPP = +9m.39s., iS = +14m.16s., iSSE = +17m.16s. Two shocks suggested ; T_0 = 3h.59m.37s. and 3h.59m.51s.
Ann Arbor ePP = +9m.37s., eSS = +17m.1s., eSSSE = +18m.7s., eSSSN = +18m.25s. ; T_0 = 3h.59m.24s.
Toronto PP = +9m.39s., SS = +17m.25s. ; T_0 = 3h.59m.21s.
Ottawa ePPE = +9m.51s., eE = +15m.46s., eSS = +17m.37s. ; T_0 = 3h.59m.42s.
Buffalo i = +9m.49s.
Pittsburgh iPP = +10m.16s., i = +10m.33s., eSS = +18m.2s., e = +18m.25s. = S_cS +9s.
Fordham iPS = +15m.43s.
East Machias i = +15m.50s.
Harvard ePPP = +11m.2s., eSS = +18m.21s. ; T_0 = 3h.59m.30s.
Osaka i = +13m.39s.
Zinsen eNZ = +9m.43s., ePPZ = +11m.28s., eZ = +15m.32s.
Chiufeng i = +18m.23s.
Helsingfors ePPE = +11m.52s., eSKSE = +18m.56s. ; T_0 = 3h.59m.27s.
Ekaterinburg i = +10m.17s.
San Juan eSS = +28m.3s.
Tashkent e = +14m.6s. = PP +1s. and +31m.5s.
Hong Kong PP? = +21m.5s., S = +29m.30s., ? = +30m.36s.
Toledo i = +11m.48s., P_cP = +12m.19s.
Tiflis eN = +11m.59s., PPPN = +16m.47s., SKSEN = +21m.50s., SSE = +26m.50s., e = +31m.31s.
Huancayo e = +22m.55s.
Bombay SSN = +29m.40s.
Long waves were also recorded at Honolulu T.H., Wellington, Ivigtut, Cape Town, La Plata, Perth, and other European stations.

Jan. 4d. 21h. 10m. 51s. Epicentre 28°·5N. 127°·0W. N.2.

A = − ·529, B = − ·702, C = + ·477 ; D = − ·799, E = + ·602 ;
G = − ·287, H = − ·381, K = − ·879.

	Δ	Az.	P.	O − C.	S.	O − C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Santa Barbara	8·6	45	e 2 3	+ 1	i 3 40	+ 1	—	—
Pasadena	9·4	51	i 2 12	− 1	i 3 55	− 4	—	—
Mount Wilson	9·6	51	e 2 18	+ 2	i 4 0	− 3	—	—
Branner	9·8	23	e 2 20	+ 2	—	—	—	—
Riverside	9·9	54	e 2 18	− 1	e 4 5	− 6	—	—
Berkeley	10·2	21	e 2 22	− 2	i 4 20	+ 2	—	—
Haiwee	10·8	43	e 2 34	+ 2	—	—	—	—
Ukiah	11·1	16	—	—	e 4 48	+ 7	—	—
Tinemaha	11·3	39	e 2 37	− 2	e 5 11	+26	—	—
Tucson	14·4	71	i 3 21	0	—	—	6·4	—
Honolulu T.H.	28·8	263	—	—	e 11 57	SS	—	—
Sitka	29·2	351	—	—	e 13 3	?	—	—
Florissant	32·0	62	e 6 21	− 2	e 11 36	+ 1	—	16·4
St. Louis	32·0	62	e 6 22	− 1	e 11 37	+ 2	e 16·0	—
Madison	33·5	54	e 6 35	− 1	e 11 54	− 4	15·9	—
Toronto	40·7	55	e 7 38	0	e 13 48	+ 1	21·2	—
Ottawa	43·5	53	e 8 1	0	e 14 33	+ 5	e 21·2	—
La Paz N.	72·5	121	e 11 20	− 6	—	—	—	—

Additional readings :—
Berkeley eP = +2m.29s.
Tucson e = +4m.31s. and +4m.43s.
Ottawa eSSS = +18m.15s. = S_cS +12s. ; T_0 = 21h.10m.54s.
Long waves were also recorded at other American stations.

Jan. 4d. Readings also at 0h. (Almeria, Huancayo, Nagoya, and near Mizusawa), 1h. (Berkeley, Branner, Lick, San Francisco, Ukiah, Tucson, and near Tyosi), 4h. (Lick), 8h. (Andijan and Bombay), 10h. (Berkeley (2), Lick (2), Branner, San Francisco, and Tucson), 11h. (Berkeley (2) and Lick (2)), 16h. (Mizusawa), 17h. (Casamicciola), 18h. (Andijan, Phu-Lien, and Casamicciola), 22h. (Bagnères and Branner).

Jan. 5d. 6h. 50m. 34s. Epicentre 39°·0N. 118°·5W. N.2.

A = − ·371, B = − ·683, C = + ·629 ; D = − ·879, E = + ·477 ;
G = − ·300, H = − ·553, K = − ·777.

	Δ	Az.	P.	O − C.	S.	O − C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Lick	2·9	236	e 0 38	− 3	1 20	+ 6	—	—
Berkeley	3·1	249	i 0 42_a	− 2	i 1 32	S*	—	—
Branner	3·3	242	0 45_a	− 2	—	—	—	—
San Francisco	3·3	248	i 0 47_a	0	i 1 31	+ 6	—	—
Ukiah	3·7	273	e 0 59	+ 6	(i 1 42)	+ 7	i 1·7	—
Bozeman	8·7	37	—	—	e 3 0	−41	e 4·6	—
Tucson	9·1	135	2 8	− 1	e 3 45	− 6	4·4	—
Seattle	9·1	343	e 2 8	− 1	e 4 38	S*	e 5·2	—
Victoria	10·0	341	4 12	S	(4 12)	− 1	5·6	6·7
Denver	10·5	82	—	—	e 4 34	+ 8	e 5·1	5·7
Little Rock	21·2	93	i 4 44	+ 2	e 8 44	+14	i 11·1	—
Florissant	21·8	82	e 4 43	− 6	i 8 54	+12	—	11·4
St. Louis	22·0	82	e 4 48	− 3	e 8 56	+10	i 11·5	14·4
Madison	22·2	70	e 5 6	+13	e 9 5	+15	10·8	—
Chicago	23·6	73	—	—	e 9 26	+10	e 12·6	—
Ann Arbor	26·4	72	—	—	e 10 50	SS	e 14·2	14·6
Toronto	29·5	68	e 3 48	?	e 11 58	+62	15·9	—
Columbia	30·3	87	—	—	e 11 41	+32	e 15·1	—
East Machias	37·9	65	—	—	e 15 14	SS	—	—
Cheb	81·0	29	—	—	e 33 26?	?	e 42·4	44·4
Florence	85·6	34	e 14 46	?	—	—	—	38·4

For Notes see next page.

NOTES TO JANUARY 5d. 6h. 50m. 34s.

Additional readings :—
Branner iE = +51s. =P* −2s., iN = +55s.
San Francisco iEN = +51s. =P* −2s.
Ukiah i = +1m.3s. =P* +3s.
Tucson e = +3m.9s., i = +4m.12s.
Ann Arbor eN = +11m.20s., e?E = +12m.2s., eN = +13m.8s., eE = +13m.44s.
East Machias e = +16m.38s.

Long waves were also recorded at Honolulu T.H., Sitka, Pittsburgh, Charlottesville, Harvard, San Juan, La Paz, Baku, Ekaterinburg, Tashkent, and Tiflis.

Jan. 5d. 13h. 49m. 18s. Epicentre 16°·0S. 176°·5W. N.3.

A = −·959, B = −·059, C = −·276 ; D = −·061, E = +·998 ;
G = +·275, H = +·017, K = −·961.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	5·1	66	—	—	e 2 26	S*	4·2	5·4
Suva	5·3	245	1 15	0	2 15	0	2·5	2·7
Wellington	26·4	195	—	—	i 10 14	+ 9	13·0	17·7
Riverview	34·1	232	—	—	e 15 12	?	e 17·7	22·5
Sydney	34·1	232	e 11 54	S	(e 11 54)	−14	17·1	19·3
Melbourne	40·2	229	—	—	e 13 55	+16	19·2	28·3
Adelaide	44·3	235	—	—	e 14 50	+10	19·0?	32·8
Perth	62·9	241	e 15 12	?	e 18 32	−22	e 30·1	—
Batavia	75·5	267	e 11 54	+11	—	—	—	—
Chiufeng	84·0	315	e 9 30	?	i 13 1	?	—	—

Additional readings :—
Sydney iS = +15m.12s.
Perth e = +25m.32s.
Long waves were also recorded at Arapuni, Christchurch, Honolulu T.H., Hong Kong, Huancayo, East Machias, Florence, and San Fernando.

Jan. 5d. 18h. 3m. 41s. Epicentre 24°·5N. 122°·2E. (as on 1930 Nov. 11d.). X.

A = −·485, B = +·770, C = +·415 ; D = +·846, E = +·533 ;
G = −·221, H = +·351, K = −·910.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	0·8	311	e 0 57?	+46	i 1 7	+46	—	1·7
Hokoto	2·7	248	0 41	+ 2	0 59	−10	—	—
Hong Kong	7·7	255	1 48	− 1	3 9	− 7	3·6	4·8
Nanking	8·2	340	e 2 27	?	e 4 37	S_g	—	—
Manila	10·0	187	2 20	− 1	4 11	− 2	—	—
Chiufeng	16·4	343	e 4 19	+33	e 8 57	?	—	—

Long waves were recorded at Phu-Lien.

Jan. 5d. Readings also at 1h. (Bombay, Tashkent, Ekaterinburg, Tiflis (2), Ksara, Tchimkent, and near Andijan (2)), 3h. (Berkeley), 4h. (Vienna, near Mizusawa, Tyosi, and near Andijan), 5h. (Branner, Berkeley, and Lick), 6h. (Branner and near Andijan), 7h. (Berkeley (2), Branner, Lick (3), Ukiah, San Francisco, and Tucson), 8h. (Lick, La Paz, near Almata, Andijan, Tchimkent, and Tashkent), 9h. (Berkeley, Branner, Lick, San Francisco, Ukiah, and Tucson), 10h. (Berkeley, Branner, Lick (2), San Francisco, Ukiah, and Tucson), 11h. (near Mizusawa), 12h. and 13h. (2) (Lick), 14h. (Batavia), 16h. (Almata and Andijan), 17h. (Athens), 18h. (near Triest, Trenta, Venice, Zagreb, and Athens), 19h. (near Andijan), 20h. (Lick), 21h. (Berkeley), 22h. (near Apia and near Tananarive), 23h. (Lick, near Belgrade and Zagreb).

Jan. 6d. 19h. 10m. 19s. Epicentre 22°·0S. 1°·0E. N.3.

A = +·927, B = +·016, C = −·375; D = +·017, E = −1·000;
G = −·375, H = −·007, K = −·927.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Cape Town		19·5	131	4 27	+ 3	8 7	+11	11·9	—
Tananarive		43·6	95	e 8 2	0	e 15 5	+35	—	23·4
La Paz	N.	65·0	262	e 10 39	0	—	—	—	—
Huancayo		73·0	264	e 11 26	− 3	21 15	PS	e 36·7	—
Bombay		81·3	66	—	—	e 22 41	+11	—	—
Batavia		102·2	102	e 13 8	−46	i 23 47	[−49]	—	—
Pasadena	z.	125·7	298	e 19 7	[+ 9]	—	—	—	—
Tinemaha	z.	126·0	301	e 19 10	[+11]	—	—	—	—

Tananarive e = +9m.53s. = P_cP − 1s.
Long waves were also recorded at Wellington, San Fernando, Cheb, and Tiflis.

Jan. 6d. Readings also at 1h. (Lick and near Wellington), 3h. (Phu-Lien), 4h. (Lick (2)), 5h. (Berkeley and Lick), 6h. (Bagnères), 8h. (near Apia), 10h. (near Kobe, Osaka, and Sumoto), 11h. (near Andijan), 12h. (near Sumoto), 13h. (Berkeley (2), Branner (2), Lick (2), Ukiah, San Francisco, and Tucson (2)), 15h. (near Mizusawa), 16h. (Berkeley (2), Branner, Lick (2), Nagoya, near Mizusawa, and Tyosi), 17h. (Lick and near Tananarive), 18h. (near Nagoya), 22h. (near Andijan and Tchimkent), 23h. (San Juan, Berkeley, near Branner, and Lick).

Jan. 7d. 4h. 6m. 44s. Epicentre 40°·3N. 144°·0E. (as given by Tokyo). N.1.

Probable error of epicentre ±0°·24.

A = −·617, B = +·448, C = +·647; D = +·588, E = +·809;
G = −·523, H = +·380, K = −·763.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Miyako	1·7	247	0 24	0	0 49	+ 5	—	—
Urakawa	2·1	334	0 25	− 5	0 58	+ 4	—	—
Morioka	2·3	255	0 28	− 5	1 3	+ 4	—	—
Aomori	2·5	282	0 29	− 7	1 3	− 1	—	—
Mizusawa	2·5	242	0 33	− 3	i 1 21	S_g	—	—
Akita	3·0	258	0 39	− 5	1 29	S*	—	—
Sendai	3·2	230	0 44	− 2	1 39	S_g	—	—
Sapporo	3·3	324	0 44	− 3	1 34	S*	—	—
Asahigawa	3·7	342	0 47	− 6	1 28	− 7	—	—
Hukusima	3·8	228	0 51	− 3	2 0	S_g	—	—
Mito	4·8	216	1 5	− 3	2 22	S*	—	—
Kakioka	5·1	217	1 10	− 3	2 30	S*	—	—
Tukubasan	5·1	218	1 13	0	2 31	S*	—	—
Tyosi	5·2	210	e 1 19	+ 5	2 16	+ 3	2·7	3·5
Kumagaya	5·5	223	1 23	+ 5	2 31	+11	—	—
Maebasi	5·5	227	1 16	− 2	2 26	+ 6	—	—
Tokyo	5·7	217	1 26	+ 5	2 37	S*	—	—
Nagano	5·9	234	1 22	− 2	2 44	S*	—	—
Yokohama	6·0	217	1 29	+ 4	2 57	S*	—	—
Hunatu	6·3	223	1 29	− 1	3 26	S_g	—	—
Mera	6·3	213	1 24	− 6	3 19	S_g	—	—
Wazima	6·3	245	1 29	− 1	2 50	+ 9	—	—
Ootomari	6·4	352	e 1 32	+ 1	3 59	+76	—	4·9
Kohu	6·4	225	1 31	0	3 21	S_g	—	—
Misima	6·5	220	1 36	+ 4	3 4	S*	—	—
Numadu	6·6	219	1 40	+ 6	3 8	S*	—	—
Gihu	7·5	232	1 49	+ 3	3 27	+16	—	—
Nagoya	7·6	230	e 1 51	+ 3	3 44	S*	—	4·3
Hatidyozima	7·9	206	2 0	+ 8	3 24	+ 3	—	—
Hikone	8·0	233	1 58	+ 5	3 48	S*	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kameyama		8·1	230	2 2	+ 7	5 19	?	—	—
Kyoto		8·4	234	1 57	− 2	4 5	S*	—	—
Toyooka		8·7	239	i 2 4	+ 1	i 3 48	+ 7	i 4·6	6·2
Osaka		8·8	233	2 6	+ 1	4 23	S*	—	5·9
Kobe		9·0	235	e 2 8	+ 1	e 3 52	+ 3	—	5·4
Wakayama		9·3	232	2 17	+ 6	4 16	+20	—	—
Sumoto		9·4	234	2 13	0	4 6	+ 7	—	5·6
Siomisaki		9·5	227	2 3	−11	4 34	S*	—	—
Koti		10·7	234	e 2 32	+ 1	e 4 39	+ 8	e 5·5	6·4
Hamada		10·9	244	2 27	− 6	4 34	− 2	—	—
Matuyama		11·0	238	2 34	− 1	6 17	S_g	—	—
Simidu		11·6	234	2 40	− 3	5 20	S*	—	—
Hukuoka		12·8	242	2 52a	− 7	5 19	− 3	—	9·8
Hukuoka B.		12·8	242	2 52	− 7	5 19	− 3	—	—
Husan		12·9	251	e 3 14	+13	(e 5 53)	+28	e 5·9	—
Taikyu		12·9	255	e 3 1	0	(5 24)	− 1	5·4	7·3
Kumamoto		13·0	239	3 6	+ 4	7 9	S_g	—	—
Miyazaki		13·1	235	3 3	0	5 27	− 2	—	—
Titizima		13·3	187	3 11	+ 5	5 23	−11	—	—
Keizyo		13·5	263	3 7	− 2	(5 43)	+ 4	5·7	8·7
Nagasaki		13·6	241	e 3 2	− 8	6 22	+41	—	8·9
Zinsen		13·8	264	e 3 13	0	(e 5 47)	+ 1	e 5·8	7·6
Heizyo		14·1	271	3 11	− 6	(e 6 24)	+31	e 6·4	7·6
Tomie		14·5	243	3 23	+ 1	6 52	+49	—	—
Naha		19·6	229	4 24	− 1	8 24	+26	—	—
Zi-ka-wei	Z.	20·4	251	4 26	− 8	8 16	+ 2	11·5	14·6
Chiufeng		21·2	279	4 33a	− 9	i 8 33	+ 3	10·7	12·7
Nanking		21·9	256	e 4 44	− 6	e 9 5	SS	10·7	13·2
Isigakizima		23·1	232	5 2	0	9 17	+10	—	—
Taihoku		24·2	238	e 5 14	+ 2	—	—	e 13·3	15·3
Irkutsk		29·5	307	5 56	− 5	10 51	− 5	14·3	16·9
Hong Kong		30·9	244	6 16	+ 3	11 21	+ 3	14·8	21·9
Manila		32·7	225	6 32	+ 3	11 51	+ 5	—	19·6
Phu-Lien		37·3	250	e 7 10	+ 1	12 59	+ 3	17·3	21·6
Amboina		46·3	202	8 27	+ 4	i 15 15	+ 6	18·3	—
Almata		48·7	297	e 8 50	+ 9	—	—	—	—
Calcutta		49·8	267	8 56	+ 6	16 8	+10	26·3	31·6
Sitka		52·4	42	—	—	i 16 47	+13	i 27·2	—
Honolulu T.H.		52·5	93	—	—	e 16 41	+ 6	e 22·8	—
Andijan		52·8	296	e 9 5	− 7	e 16 57	+18	29·3	—
Tchimkent		54·1	299	9 16	− 6	—	—	28·3	—
Tashkent		54·7	298	9 27	+ 1	i 17 17	+12	26·3	42·9
Medan		54·8	241	e 8 34	−53	i 17 10	+ 4	29·3	—
Batavia		57·7	225	9 52	+ 4	17 48	+ 2	29·3	—
Hyderabad		60·4	268	10 6	− 1	18 31	+10	30·5	39·7
Bombay		63·7	273	10 31	+ 1	19 9	+ 5	32·4	40·8
Kodaikanal		65·6	263	10 38	− 4	19 24	− 3	37·4	46·4
Colombo		65·9	258	19 28	S	(19 28)	− 3	—	43·9
Pulkovo		66·2	330	10 41	− 6	i 19 34	− 1	34·8	42·3
Suva		66·7	144	—	—	e 20 16?	+35	—	—
Ukiah		67·7	57	—	—	e 20 4	+11	—	—
Baku		67·8	305	i 10 58	+ 1	i 19 59	+ 5	33·3	—
Helsingfors		67·9	333	i 10 54	− 4	i 19 53	− 3	e 28·9	—
Berkeley	E.	69·0	58	—	—	i 20 16	+ 7	—	—
Tiflis	E.	70·2	308	i 11 20?	+ 8	i 20 34?	+10	e 36·8?	47·8?
Upsala		70·6	335	11 13	− 1	20 27	− 1	e 34·3	44·5
Bozeman		71·0	45	—	—	e 20 28	− 5	e 30·3	—
Tinemaha		72·1	57	i 11 23	0	e 20 56	+10	—	—
Haiwee		72·8	57	i 11 30	+ 2	—	—	—	—
Theodosia		73·4	316	e 11 26	− 5	e 20 58	− 3	38·3	—
Bergen		73·7	340	—	—	e 29 16?	?	e 36·3	41·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mount Wilson	Z.	73·9	58	e 11 31	− 3	—	—	—	—
Pasadena	Z.	73·9	58	e 11 31	− 3	i 21 9	+ 2	—	—
Riverview		74·4	174	e 12 46	+69	(e 21 16)	+ 3	e 21·3	32·0
Sydney		74·4	174	i 21 10	S	(i 21 10)	− 3	44·3	45·4
Yalta		74·4	316	11 34	− 3	21 8	− 5	41·3	—
Riverside		74·5	58	e 11 46	+ 9	—	—	—	—
Adelaide		75·4	185	—	—	i 21 25	0	39·6	53·0
Copenhagen		75·6	334	11 44	0	21 24	− 3	35·3	—
Perth		76·8	204	e 20 36	S	(e 20 36)	−65	—	—
Potsdam		78·0	332	i 12 17	+20	i 21 50	− 4	e 40·3	44·3
Melbourne		78·1	180	—	—	e 21 46	− 9	34·7	—
Hamburg		78·1	334	e 11 55	− 3	e 21 55	0	e 36·3	43·3
Prague		79·4	330	e 12 11?	+ 6	e 22 10	+ 1	e 39·3	44·3
Budapest		79·6	325	12 11	+ 5	22 20	+ 9	42·3	45·3
Edinburgh		79·8	342	—	—	i 22 18	+ 4	38·3	47·4
Vienna		79·8	328	e 12 3	− 4	22 26	+12	e 43·3	56·3
Jena	E.	79·8	331	12 4	− 3	22 16	+ 2	e 41·3	48·5
	N.	79·8	331	e 12 16	+ 9	e 22 4	−10	e 38·3	48·8
Tucson		79·8	55	e 12 19	+12	i 22 19	+ 5	e 33·4	—
Göttingen		79·9	334	i 12 5	− 2	—	—	e 29·3	47·3
Cheb		80·2	330	e 12 23	+14	e 22 16	− 2	e 39·3	45·8
Ksara		80·6	307	12 15	+ 4	22 20	− 2	—	46·8
De Bilt		80·9	336	i 12 16	+ 3	e 22 24	− 1	e 38·3	45·3
Belgrade		81·0	322	e 12 8	− 5	e 22 33	+ 7	e 46·2	—
Feldberg	E.	81·5	333	—	—	e 22 22	−10	—	44·4
Stonyhurst		81·5	341	(e 12 31)	+15	e 12 31	P	38·3	46·3
Zagreb		82·1	326	e 12 16	− 3	e 22 34	− 4	e 43·3	44·8
Uccle		82·3	336	e 12 19	− 1	22 35	− 5	e 38·3	48·0
Stuttgart		82·4	332	e 12 22	+ 2	e 22 39	− 2	e 41·3	47·3
Karlsruhe		82·5	333	e 12 16?	− 5	—	—	e 45·3	—
Strasbourg		82·8	333	12 25	+ 3	22 49	+ 4	e 38·3	53·8
Oxford		83·1	339	—	—	i 22 46	− 2	41·3	46·5
Kew		83·1	339	e 12 16?	− 8	e 22 47	− 1	e 38·3	48·3
Triest		83·2	327	12 28	+ 4	i 22 41	[− 4]	e 42·3	48·8
Madison		83·6	36	—	—	e 22 51	− 2	—	39·3
Zurich		83·8	332	e 12 27	0	e 22 54	− 1	—	—
Chur		83·8	332	e 12 25	− 2	e 22 49	− 6	—	—
Treviso		83·9	328	12 34	+ 6	23 7	+11	45·8	48·8
Paris		84·6	336	e 12 16?	−15	e 23 16?	+12	41·3	49·3
Neuchatel		84·7	332	e 12 27	− 5	e 22 58	− 7	—	—
Besançon		84·9	332	e 12 33	0	—	—	e 41·3	—
Piacenza		85·3	330	12 44	+ 9	23 6	− 5	37·3	57·1
Prato		85·7	328	e 12 37	0	21 39	?	46·3	48·3
Florence		85·7	328	12 44	+ 7	23 6	[+ 2]	29·3	42·3
Helwan		86·2	306	e 12 33	− 6	i 23 4	[− 4]	53·3	60·9
Wellington		86·3	158	—	—	23 4	[− 4]	41·9	45·3
Florissant		86·6	40	i 12 49	+ 8	e 23 10	[− 1]	—	—
Ann Arbor		86·8	33	e 23 22	S	(e 23 22)	− 3	e 46·0	—
Puy de Dôme		87·2	334	e 12 36	− 8	—	—	e 46·3	—
Trenta		87·2	322	e 12 26	−18	—	—	—	—
Little Rock		88·7	44	e 13 0	+ 9	e 23 40	− 4	—	—
East Machias		90·4	22	—	—	23 55	− 5	44·6	—
Harvard		91·4	25	—	—	i 23 46	[+ 5]	e 40·8	—
Fordham		91·8	28	—	—	i 24 11	− 2	e 44·3	—
Charlottesville		92·5	32	—	—	e 24 16	− 3	e 41·3	—
Toledo		94·7	336	13 16	− 3	e 24 8	{− 5}	e 43·9	53·5
Alicante		94·9	333	e 13 28	+ 8	e 24 32	{+18}	e 49·1	—
Columbia		94·9	36	—	—	e 23 58	[− 2]	—	—
Granada		97·0	335	i 17 49	PP	—	—	e 45·5	55·1
Malaga		97·7	336	12 55	−38	e 24 4	[−11]	45·1	56·0
San Fernando		98·5	337	—	—	24 20	[+ 2]	51·8	57·8
San Juan		114·9	31	—	—	e 27 37	{+56}	e 46·3	—
Huancayo		135·4	62	—	—	e 21 16?	PP	e 55·3	—
La Paz		143·4	58	e 18 53	[−36]	26 0	SKS	70·1	78·0

For Notes see next page.

NOTES TO JANUARY 7d. 4h. 6m. 44s.

Additional readings :—
Tyosi P = +1m.36s. = P_g − 2s.
Osaka i = +2m.31s. and +2m.52s. ; epicentre 40°·3N. 144°·0E.
Kobe P = +2m.15s., iE = +2m.51s.
Zi-ka-wei iZ = +4m.34s., PPZ = +4m.50s., PPPZ = +5m.2s., PPPPZ = +5m.12s. SE = +8m.37s., SSZ = +8m.50s., iZ = +9m.44s. and +10m.32s.
Chiufeng iP = +4m.42s., iPP = +4m.58s.
Nanking iN = +10m.12s.
Hong Kong PPP = +7m.22s.
Sitka iSS = +20m.21s., i = +22m.25s.
Medan i = +11m.54s.
Ukiah e = +27m.46s.
Helsingfors ePPPE = +15m.15s., eSSE = +24m.15s., eSSSE = +27m.35s., eSSSN = +27m.59s. ; T_0 = 4h.6m.35s.
Tiflis ePPE = +14m.0s., eSSE = +25m.16s. ?
Upsala eSS = +25m.33s., eSSS = +28m.25s.
Bozeman eSS = +25m.16s.
Tinemaha iZ = +11m.32s.
Haiwee i = +11m.42s.
Mount Wilson i = +11m.44s.
Sydney e = +20m.46s., iSE = +29m.52s.
Adelaide i = +22m.20s.
Copenhagen +14m.34s. = SS + 7s. and +26m.16s.? = SS + 9s.
Potsdam eE = +11m.34s., ePPE = +14m.52s., ePPPE = +18m.10s., eN = +18m.52s., iEN = +22m.5s., iPSN = +22m.30s., eE = +23m.4s., eSSSE = +30m.16s. ?
Melbourne i = +22m.28s. = PS + 3s. and +26m.42s. = SS − 2s.
Edinburgh i = +27m.32s. = SS + 23s.
Vienna iE = +15m.0s. = PP − 2s., PP = +15m.42s., iE = +19m.25s., PS = +23m.29s., iN = +25m.41s.
Cheb e = +26m.29s.
De Bilt eSS = +27m.40s.
Belgrade e = +12m.14s.
Stonyhurst eSS? = +27m.49s.
Zagreb ePP = +15m.16s.?
Uccle PP = +15m.35s., SS = +27m.57s.
Stuttgart ePP = +15m.34s.
Strasbourg ePP = +15m.52s., ePPP = +18m.16s., eSS = +28m.19s.
Kew eSS = +28m.16s., e = +29m.32s.
Triest i = +22m.54s. = S + 5s., e = +32m.16s. ?
Madison e = +28m.16s. = SS + 10s.
Treviso PP = +12m.41s.
Wellington SS = +28m.52s.
Little Rock iEN = +13m.18s.
Harvard e = +30m.13s. = SS + 13s. and +33m.40s. = SSS + 6s.
Fordham e = +30m.40s.
Toledo e = +17m.46s., SKS = +23m.58s., S = +24m.12s., PS = +24m.46s. = S + 7s.
Columbia e = +24m.28s. = SKKS + 14s. and +44m.34s.
Malaga PP = +16m.53s., i = +17m.53s., PS = +24m.48s. = SKKS + 12s., PPS = +25m.23s. = S + 17s., SSS = +34m.3s.
San Juan eSS = +35m.36s., e = +39m.47s.
Huancayo e = +37m.35s., eSS = +39m.46s.
La Paz iPKP$_a$ = +20m.1s., PP = +22m.52s., SSN = +41m.58s.
Long waves were also recorded at Ivigtut, Algiers, Tananarive, La Plata, Ekaterinburg, Sebastopol, and other European stations.

Jan. 7d. 4h. 53m. 55s. Epicentre 40°·2N. 143°·4E. N.2.

A = −·613, B = +·455, C = +·645 ; D = +·596, E = +·803 ;
G = −·518, H = +·385, K = −·764.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Miyako	1·2	242	0 21	+ 4	0 43	+12	—
Morioka	1·8	254	0 24	− 2	0 49	+ 3	—
Mizusawa	2·1	239	1 0 28	− 2	1 0 56	+ 2	—
Aomori	2·1	287	0 25	− 5	0 52	− 2	—
Akita	2·6	259	0 36	− 1	1 9	+ 2	—
Obihiro	2·7	357	0 37	− 2	1 16	+ 7	—
Sendai	2·8	225	0 38	− 2	1 17	+ 5	—
Kusiro	2·9	15	0 30	−11	1 5	− 9	—
Sapporo	3·2	332	0 44	− 2	1 25	+ 3	—
Hukusima	3·3	223	0 48	+ 1	1 29	+ 4	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Mito		4·4	212	1 2	− 1	—	—	—
Tukubasan		4·8	214	1 5	− 3	1 59	− 4	—
Tyosi		4·9	205	e 1 11	+ 1	2 35	S_g	3·2
Kumagaya		5·1	220	1 11	− 2	2 19	+ 9	—
Maebasi		5·2	223	1 10	− 4	2 21	+ 8	—
Tokyo		5·3	214	1 36	P_g	—	—	—
Nagano		5·4	231	1 11	− 6	2 41	S*	—
Yokohama		5·6	214	1 21	+ 1	2 43	S*	—
Wazima		5·8	243	1 26	+ 4	3 2	S_g	—
Kohu		5·9	222	1 27	+ 3	3 2	S_g	—
Hunatu		6·0	219	1 26	+ 1	3 6	S_g	—
Gihu		7·1	230	1 53	P*	3 25	S*	—
Nagoya		7·2	228	e 1 54	P*	3 47	S_g	—
Kameyama		7·7	228	2 7	+18	4 17	S_g	—
Osaka		8·3	231	2 13	+15	4 23	S_g	5·0
Tinemaha	E.	72·5	57	e 11 16	−10	—	—	—
Pasadena	Z.	74·3	59	e 11 26	−10	—	—	—
Mount Wilson	Z.	74·3	59	i 11 27	− 9	—	—	—

No additional readings.

Long waves were recorded at Tashkent and Ekaterinburg.

Jan. 7d. 10h. 41m. 26s. Epicentre 34°·8N. 132°·9E. (as on 1931 March 4d.). X.

Koti and Osaka give epicentre 34°·8N. 132°·8E.

A = −·559, B = +·602, C = +·571.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Koti	1·3	158	e 0 22	P_g	i 0 40	S_g	—
Sumoto	1·7	105	0 24	0	0 48	S*	0·9
Toyooka	1·8	65	i 0 26	0	i 0 46	0	0·8
Kobe	1·9	94	i 0 29	+ 1	i 0 53	S*	0·9
Osaka	2·2	94	0 31	0	1 4	S*	1·1
Hukuoka	2·4	239	0 38	P*	1 11	S*	1·3
Nagoya	3·3	83	e 0 50	+ 3	1 40	S*	—

No additional readings.

Jan. 7d. 20h. 7m. 58s. Epicentre 40°·2N. 143°·4E. (as at 4h.53m.). R.2.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Morioka	1·8	254	0 24	− 2	0 50	+ 4
Mizusawa	2·1	239	e 0 29	− 1	i 0 58	+ 4
Aomori	2·1	287	0 27	− 3	0 54	0
Akita	2·6	259	0 51	P_g	1 24	S_g
Sendai	2·8	225	0 39	− 1	1 16	+ 4
Sapporo	3·2	332	0 48	+ 2	1 35	S*
Hukusima	3·3	223	0 47	0	1 43	S_g
Nemuro	3·5	27	0 42	− 8	1 10	−20
Mito	4·4	212	0 50	−13	2 7	S*
Tukubasan	4·8	214	1 6	− 2	2 4	+ 1
Kumagaya	5·1	220	1 15	+ 2	2 45	S_g
Maebasi	5·2	223	1 12	− 2	2 36	S*
Tokyo	5·3	214	1 37	P_g	2 43	S_g
Nagano	5·4	231	1 18	+ 1	2 45	S*
Yokohama	5·6	214	1 29	P*	2 56	S_g
Kohu	5·9	222	1 28	+ 4	3 0	S*
Hunatu	6·0	219	1 26	+ 1	2 42	S*
Misima	6·2	216	1 33	+ 5	2 56	S*
Gihu	7·1	230	1 55	P*	3 21	S*
Nagoya	7·2	228	e 2 2	P*	3 34	S*

Mizusawa iSE = +1m.8s.
Long waves were recorded at Ekaterinburg and Tashkent.

Jan. 7d. Readings also at 1h. (Wellington), 2h. (Berkeley, Branner, and Lick), 3h. (Apia, Berkeley, and Lick), 4h. (Tiflis, Pulkovo, and near Mizusawa (5)), 5h. (near Mizusawa (7), Nagoya, and Tyosi), 6h. (near Mizusawa (2), Nagoya, and Tyosi), 7h. (near Mizusawa (3)), 8h. (Berkeley, Lick, Bombay, Andijan, Tchimkent, near Chiufeng, Nagoya, and near Mizusawa (5)), 9h. (near Mizusawa (6)), 10h. (near Mizusawa (3), near Andijan and Tchimkent), 12h. (Lick, near Mizusawa (2)), 13h. (Mizusawa), 14h. (near Apia), 15h. (near Mizusawa (2)), 16h. (near Kobe and Sumoto), 18h. (Mizusawa and near Malabar), 19h. (Haiwee, Pasadena, Mount Wilson, Tinemaha, and near Mizusawa), 20h. (Ekaterinburg, Tashkent, and near Mizusawa (2)), 21h. (Mizusawa).

Jan. 8d. 6h. 28m. 58s. Epicentre 40°·3N. 144°·0E. (as on 7d.) R.1.

Probable error of epicentre ±0°·21.

A = −·617, B = +·448, C = +·647 ; D = +·588, E = +·809 ; G = −·523, H = +·380, K = −·763.

The Japanese stations give 41°·2N. 142°·9E., but this position does not suit the observational data, which tend to support the view that this shock is a repetition of Jan. 7d. 4h. 6m.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Morioka		2·3	255	0 30	− 3	0 54	− 5	—	—
Aomori		2·5	282	0 33	− 3	1 8	+ 4	—	—
Mizusawa		2·5	242	i 0 36	0	i 1 19	S_g	—	—
Akita		3·0	258	0 43	0	1 39	S_g	—	—
Nemuro		3·2	21	0 45	− 1	1 18	− 4	—	—
Sendai		3·2	230	0 43	− 3	1 23	+ 1	—	—
Sapporo		3·3	324	0 47	0	1 29	+ 4	—	—
Asahigawa		3·7	342	0 44	− 9	1 28	− 7	—	—
Hukusima		3·8	228	0 52	− 2	1 38	+ 1	—	—
Mito		4·8	216	1 0	− 8	2 0	− 3	—	—
Kakioka		5·1	217	1 9	− 4	2 18	+ 8	—	—
Tukubasan		5·1	218	1 10	− 3	2 9	− 1	—	—
Tyosi		5·2	210	e 1 16	+ 2	2 37	S*	—	3·0
Kumagaya		5·5	223	1 18	0	2 28	+ 8	—	—
Maebasi		5·5	227	1 17	− 1	2 39	S*	—	—
Tokyo		5·7	217	1 24	+ 3	2 46	S*	—	—
Nagano		5·9	234	1 23	− 1	2 48	S*	—	—
Wazima		6·3	245	1 33	+ 3	3 6	S*	—	—
Mera		6·3	213	1 42	P*	3 43	S_g	—	—
Kohu		6·4	225	1 29	− 2	3 1	S*	—	—
Ootomari		6·4	352	e 1 33	+ 2	3 31	S_g	—	—
Hunatu		6·4	223	1 28	− 3	2 57	S*	—	—
Misima		6·5	220	1 39	+ 7	3 1	+15	—	—
Numadu		6·6	219	1 44	+10	3 26	S_g	—	—
Gihu		7·5	232	1 46	0	3 30	S*	—	—
Nagoya		7·6	230	e 2 0	P*	3 24	+10	—	4·1
Hatidyozima		7·9	206	1 29	−23	3 47	S*	—	—
Hikone		8·0	233	1 52	− 1	3 37	+13	—	—
Kameyama		8·1	230	1 58	+ 3	3 48	S*	—	—
Toyooka		8·7	239	i 2 2	− 1	—	—	—	—
Osaka		8·8	233	2 15	+10	4 2	+18	—	4·9
Kobe		9·0	235	e 2 43	+36	e 4 1	+12	—	5·0
Wakayama		9·3	232	2 22	+11	4 8	+12	—	—
Sumoto		9·4	234	2 21	+ 8	4 15	+16	—	5·2
Siomisaki		9·5	227	2 24	+10	4 36	S*	—	—
Koti		10·7	234	e 2 44	+13	5 14	S*	—	—
Hamada		10·9	244	2 41	+ 8	5 39	S*	—	—
Hukuoka	B.	12·8	242	3 46	?	6 47	S_g	—	—
Taikyu		12·9	255	2 58	− 3	(e 5 52)	S_g	e 5·9	—
Kumamoto		13·0	239	3 0	− 2	6 16	S*	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Miyazaki		13·1	235	3 1	− 2	5 34	+ 5	—	—
Keizyo		13·5	263	e 3 5	− 4	—	—	e 7·2	—
Zinsen	E.	13·8	264	e 3 8	− 5	e 5 38	− 8	e 7·5	—
Heizyo	E.	14·1	271	e 3 5	−12	—	—	—	—
Zi-ka-wei	Z.	20·4	251	4 28	− 6	8 8	− 6	12·2	14·5
Chiufeng		21·2	279	i 4 35_a	− 7	8 32	+ 2	11·1	14·6
Nanking		21·9	256	4 44	− 6	e 8 55	+11	12·1	—
Irkutsk		29·5	307	e 6 4	+ 3	e 10 50	− 6	16·0	18·3
Hong Kong		30·9	244	6 16	+ 3	11 12	− 6	14·6	21·5
Manila		32·7	225	e 6 28	− 1	12 8	+22	—	—
Andijan		52·8	296	e 9 8	− 4	—	—	—	—
Ekaterinburg		53·8	318	i 9 20	0	16 54	+ 1	34·1	35·1
Tchimkent		54·1	299	e 9 21	− 1	—	—	—	—
Tashkent		54·7	298	e 9 25	− 1	17 6	+ 1	e 29·0	35·0
Bombay		63·7	273	e 11 2	(− 6)	—	—	—	—
Pulkovo		66·2	330	e 10 46	− 1	e 19 31	− 4	36·0	37·4
Baku		67·8	305	e 10 56	− 1	e 21 2	(+14)	e 36·0	43·0
Tiflis		70·2	308	e 11 8	− 4	e 21 12	(+ 6)	37·0	—
Tinemaha	Z.	72·1	57	e 11 23	0	—	—	—	—
Mount Wilson	Z.	73·9	58	i 11 34	0	—	—	—	—
Pasadena		73·9	58	e 11 34	0	—	—	—	—
Vienna	Z.	79·8	328	12 4	− 3	—	—	—	—
Cheb		80·2	330	—	—	e 31 2?	?	e 43·0	47·5
Neuchatel		84·7	332	e 12 30	− 2	—	—	—	—

Additional readings :—
Mizusawa iSN = +1m.23s. = S_g +3s.
Tyosi PP = +1m.24s. = P* −4s.
Toyooka iPEN = +2m.9s.
Osaka i = +2m.59s. and +4m.24s. = S* +1s.
Miyazaki +7m.12s.
Zinsen ePZ = +3m.12s.
Heizyo iE = +3m.17s.
Chiufeng PP = +5m.2s.
Long waves at Phu-Lien and other European stations.

Jan. 8d. 18h. 28m. 22s. Epicentre 41°·5N. 142°·7E. (as on 1930 July 20d.). X.

A = −·596, B = +·454, C = +·663 ; D = +·606, E = +·795 ;
G = −·527, H = +·402, K = −·749.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Mizusawa		2·7	208	i 0 39	0	i 1 5	− 4	—
Tyosi		6·0	194	e 1 27	+ 2	2 43	+10	—
Nagoya		7·8	217	e 2 20	P*	3 31	+12	—
Tiflis		68·7	307	—	—	e 24 22	SS	e 39·6
Tinemaha	Z.	72·3	56	e 11 24	− 1	—	—	—
Pasadena	Z.	74·1	58	e 11 34	− 1	—	—	—
Mount Wilson	Z.	74·2	58	e 11 35	− 1	—	—	—

Long waves were also recorded at Chiufeng and Cheb.

Jan. 8d. Readings also at 1h. (Harvard, Ekaterinburg, Tashkent, Tchimkent, near Almata, and Andijan), 2h. (Tiflis), 3h. (Port au Prince), 4h. and 5h. (near Mizusawa), 6h. (Calcutta, Lick (2), and near Mizusawa (2)), 7h. (Mizusawa), 8h. (Andijan, Tchimkent, and La Paz), 9h. (Lick (2) and Mizusawa), 10h. (Mizusawa), 11h. (Lick), 12h. (near Mizusawa (2)), 15h. (Bombay, Ekaterinburg, Tashkent, and Mizusawa), 16h. and 18h. (3) (near Mizusawa), 19h. (Andijan, Tchimkent, and near Tyosi), 20h. (Ottawa, near Mizusawa, Nagoya, and Tyosi), 21h. (Cheb, Huancayo, La Paz, and near Mizusawa), 22h. (near Mizusawa).

Jan. 9d. 2h. 1m. 47s. Epicentre 36°·5N. 70°·5E. (as on 1932 April 30d.). R.1.

A = +·268, B = +·758, C = +·595 ; D = +·943, E = −·334 ;
G = +·199, H = +·561, K = −·804.

A *depth* of focus 0·025 used on previous occasions with this epicentre has been retained.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Andijan		0·0	4·5	21	i 1 3	− 1	—	—	—	—
Tchimkent		0·0	5·8	353	i 1 22	0	e 1 36	?	—	—
Almata		−0·2	8·4	34	1 59	+ 3	3 15	−14	—	3·7
Dehra Dun		−0·2	8·8	133	2 33	+31	—	—	3·2	3·2
Agra		−0·4	11·3	143	2 37	+ 4	e 4 31	− 5	—	—
Baku		−0·8	16·6	290	i 3 41	+ 2	i 6 42	+ 8	7·1	7·7
Bombay		−0·8	17·7	173	3 50	− 3	7 2	+ 3	9·0	12·0
Hyderabad		−1·0	20·3	157	4 13	− 9	7 43	− 9	10·2	11·2
Tiflis		−1·0	20·5	293	i 4 22	− 2	i 8 3	+ 7	e 11·2	—
Calcutta		−1·1	20·8	127	4 20	− 6	8 5	+ 5	—	—
Ekaterinburg		−1·1	21·4	345	i 4 30	− 3	i 8 10	− 2	11·2	—
Kodaikanal		−1·5	27·0	165	5 28	+ 3	8 26	PcP	9·2	9·9
Theodosia		−1·5	27·7	299	e 5 31	0	11 37	?	—	—
Ksara		−1·6	28·3	275	e 5 36	+ 1	i 10 12	+ 2	—	14·9
Yalta		−1·7	28·5	298	e 5 36	0	e 11 47	?	—	—
Sebastopol		−1·7	29·0	298	e 6 5?	PP	—	—	—	—
Colombo		−1·7	30·8	164	5 55	− 2	11 19	+29	20·4	20·7
Helwan		−1·8	33·2	270	i 6 18	+ 1	i 11 25	− 1	—	—
Pulkovo		−1·9	34·6	327	i 6 26	− 3	i 11 39	− 7	14·7	15·3
Phu-Lien		−2·0	35·1	110	6 30	− 3	11 45	− 7	14·2	—
Chiufeng		−2·0	35·5	70	i 6 34a	− 2	i 11 56	− 2	—	—
Lemberg		−2·0	35·7	308	e 6 31	− 7	—	—	—	12·0
Athens		−2·0	36·9	287	i 6 48a	0	i 12 18	− 2	—	12·4
Helsingfors		−2·0	37·2	324	i 6 51	0	i 12 22	− 2	—	—
Belgrade		−2·0	38·3	301	e 6 57a	− 3	i 12 40	− 1	e 18·0	—
Budapest		−2·1	39·0	305	7 6	0	i 12 50	0	15·7	16·7
Nanking		−2·1	39·7	83	i 7 9a	− 3	i 12 59	− 1	16·3	—
Hong Kong		−2·1	40·2	100	7 14	− 2	13 5	− 3	19·8	—
Upsala		−2·1	40·7	323	i 7 19	− 1	i 13 14	− 1	—	24·3
Vienna		−2·1	40·8	307	i 7 21	0	i 16 59	?	—	—
Zagreb		−2·2	41·3	301	e 7 23	− 1	e 13 25	+ 3	—	—
Medan		−2·2	41·8	136	6 45	−44	i 13 22	− 8	—	—
Prague		−2·2	41·9	308	i 7 35	+ 6	i 13 38	+ 6	—	—
Zi-ka-wei	Z.	−2·2	42·1	84	i 7 29	− 2	i 13 40	+ 5	—	21·4
Trenta		−2·2	42·2	290	i 7 28	− 4	i 13 28	− 8	—	—
Potsdam		−2·2	42·7	313	i 7 36	0	i 13 45	+ 1	e 17·7	—
Triest		−2·2	42·8	302	i 7 37	0	i 13 47	+ 2	—	—
Copenhagen		−2·2	43·1	316	i 7 39	− 1	i 13 50	0	—	—
Cheb		−2·2	43·2	307	i 7 39	− 1	i 15 52	?	—	—
Benevento		−2·2	43·3	293	e 7 55	+14	e 11 38	?	—	—
Naples	E.	−2·2	43·4	293	e 7 33	+ 1	e 13 53	− 1	—	—
Catania		−2·2	43·6	288	7 35	− 9	—	—	—	—
Jena		−2·2	43·7	310	e 7 44	0	i 14 1	+ 2	—	25·2
Camerino		−2·2	43·8	297	7 40	− 5	—	—	—	—
Venice		−2·2	43·8	301	i 7 51	+ 6	14 5	+ 5	—	—
Treviso		−2·3	43·9	299	i 7 45	0	i 14 5	+ 5	—	—
Zinsen	Z.	−2·3	44·1	73	7 45	− 2	e 13 59	− 4	e 18·2	—
Keizyo		−2·3	44·4	72	7 46	− 3	17 17	SS	—	—
Hamburg		−2·3	44·5	315	i 7 50a	0	i 14 12	+ 3	—	18·2
Göttingen		−2·3	44·6	311	i 7 48	− 3	e 14 6	− 4	—	19·2
Florence		−2·3	44·9	299	i 7 57	+ 4	i 14 19	+ 4	—	22·2
Prato		−2·3	45·0	299	i 7 51	− 3	i 14 13	− 3	—	—
Chur		−2·4	45·5	305	e 7 57	− 1	e 13 4	−78	—	—
Stuttgart		−2·4	45·5	309	i 7 59a	+ 1	i 14 27	+ 5	—	—
Feldberg	E.	−2·4	45·7	309	i 8 1	+ 2	e 14 36	+11	—	—

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Piacenza		−2·4	45·7	302	8 3	+ 4	i 14 29	+ 4	—	26·1
Karlsruhe		−2·4	45·9	308	8 2	+ 1	14 35	+ 7	e 22·2	—
Pavia		−2·5	46·1	302	e 7 42	−20	—	—	—	—
Zurich		−2·5	46·1	305	e 8 2	0	e 14 32	+ 2	—	—
Strasbourg		−2·5	46·5	309	i 8 4	− 1	i 14 38	+ 2	23·2	—
Bergen		−2·5	46·9	325	e 9 49	PP	14 44	+ 3	18·2	—
Neuchatel		−2·5	47·3	305	e 8 11	0	e 14 49	+ 2	—	—
De Bilt		−2·5	47·6	312	i 8 14	0	i 14 56	+ 4	—	26·2
Tunis		−2·5	47·6	289	i 8 13	− 1	i 15 49	− 3	—	—
Besançon		−2·5	47·8	305	i 8 16	+ 1	14 58	+ 3	—	—
Uccle		−2·5	48·2	310	i 8 18	0	i 15 4	+ 4	—	—
Carloforte		−2·5	48·3	293	e 8 22	+ 3	e 15 4	+ 2	—	—
Hukuoka B.		−2·5	48·3	76	8 19	0	15 2	0	—	—
Miyazaki		−2·6	49·7	78	8 27	− 2	15 22	+ 2	—	—
Manila		−2·6	49·8	103	i 8 30a	0	15 16	− 5	22·4	28·3
Paris		−2·6	49·8	309	i 8 30	0	i 15 25	+ 4	19·2	20·2
Puy de Dôme		−2·6	50·2	304	i 8 34	+ 1	i 15 32	+ 5	—	—
Koti		−2·6	50·7	75	8 35	− 2	—	—	—	—
Kew		−2·6	51·0	312	i 8 40a	+ 1	i 15 42	+ 4	—	—
Durham		−2·6	51·1	316	—	—	15 41	+ 1	—	—
Kobe		−2·7	51·5	74	e 8 42	0	e 15 46	+ 2	—	—
Oxford		−2·7	51·5	313	8 47	+ 5	i 15 45	+ 1	—	—
Sumoto		−2·7	51·5	73	i 8 41	− 1	e 15 42	− 2	e 19·6	—
Stonyhurst		−2·7	51·7	315	8 21	−23	15 31	−16	—	—
Edinburgh		−2·7	51·8	318	—	—	i 15 52	+ 4	—	29·3
Osaka		−2·7	51·8	74	8 50	+ 6	16 2	+14	—	18·9
Barcelona		−2·7	52·0	299	i 8 47	+ 1	i 15 55	+ 4	e 19·8	22·1
Bidston		−2·7	52·2	315	—	—	e 15 51	− 3	e 24·4	—
Nagoya		−2·7	52·7	70	e 8 51	0	e 16 46	+45	—	—
Algiers		−2·7	52·9	292	i 8 51	− 2	i 16 3	− 1	—	—
Tortosa	E.	−2·8	53·4	299	8 58	+ 2	15 58?	−11	—	—
	N.	−2·8	53·4	299	9 5	+ 9	i 16 8	− 1	e 19·2	22·4
Mizusawa	E.	−2·8	54·4	66	e(9 1)	− 2	16 29	+ 6	—	—
	N.	−2·8	54·4	66	(9 5)	+ 2	17 26	+63	—	—
Batavia		−2·8	54·6	135	8 59	− 6	16 1	−24	—	—
Alicante		−2·8	55·0	296	i 9 5	− 3	i 16 37	+ 6	e 20·9	—
Almeria		−2·9	56·9	296	i 9 21	0	i 16 59	+ 3	e 23·5	—
Toledo		−2·9	57·0	299	i 9 22	0	i 16 58	+ 1	e 24·4	—
Granada		−3·0	57·6	295	i 9 29a	+ 3	i 17 7	+ 3	26·4	30·1
Tananarive		−3·0	59·5	207	9 36	− 3	i 17 31	+ 1	—	—
San Fernando		−3·0	59·9	296	9 42	0	17 17	−18	—	27·2
Coimbra		−3·0	59·9	300	i 9 42	0	i 17 41	+ 6	—	—
Amboina		−3·1	66·9	114	i 10 23	− 8	i 18 57	− 8	—	—
Dakar		−3·3	79·8	280	—	—	21 26	−11	—	—
Perth		−3·4	80·5	143	(11 43)	−10	(21 24)	−20	21·4	—
Sitka		−3·4	83·9	14	—	—	i 22 1	−20	—	—
Cape Town		−3·4	85·5	221	12 58	+39	22 7	−31	49·2	54·2
Toronto		−3·6	95·3	340	—	—	i 23 13?	−59	—	—
Adelaide		−3·6	95·4	130	—	—	i 22 45	?	—	—
Bozeman		−3·6	97·7	2	—	—	e 23 27	[−48]	—	—
Madison		−3·6	98·3	346	—	—	i 23 26	[−51]	—	—
Chicago		−3·7	99·2	345	—	—	e 33 55	?	—	—
Melbourne		−3·7	101·2	130	i 17 29	PP	i 23 40	[−52]	—	—
Florissant	Z.	−3·8	102·6	346	i 17 54	PP	—	—	—	—
Riverview		−3·8	102·9	124	e 17 43	PP	e 23 49	[−51]	e 40·4	45·8
Ukiah		−3·8	103·3	12	—	—	i 23 57	[−45]	—	—
Lick		−3·8	105·2	10	e 17 25	PP	—	—	—	—
Tinemaha		—	106·0	8	i 13 50	−21	i 24 9	[−46]	—	—
Mount Wilson	Z.	—	108·8	8	e 14 3	−22	—	—	—	—
Pasadena		—	108·9	8	e 14 1	−25	—	—	—	—
Tucson		—	111·2	1	—	—	e 21 13	?	—	—
San Juan		—	111·5	316	i 18 53	PP	i 26 13	?	—	—
Wellington		—	122·7	121	—	—	23 13?	?	—	—
La Paz		—	138·4	290	i 19 0k	[−19]	—	—	70·4	80·6
La Plata		—	138·6	256	22 12	PP	28 20	{−56}	—	—
Huancayo		—	140·9	300	e 18 58	[−25]	—	—	e 53·2	—

For Notes see next page.

NOTES TO JANUARY 9d. 2h. 1m. 47s.

Additional readings and notes :—

Tiflis, i = +5m.27s.
Theodosia i = +15m.51s.
Ksara iE = +11m.40s.
Yalta i = +15m.57s.
Colombo PP = +10m.38s.
Chiufeng iPP = +7m.47s., i = +8m.58s., iSS = +14m.10s., i = +14m.32s.
Lemberg eE = +6m.37s.
Athens PPZ = +7m.30s.
Helsingfors iPPP = +8m.2s. = PP − 1s., iP_cP = +9m.16s., iE = +11m.5s., eN = +11m.9s., eP_cSE = +12m.58s., iP_cSN = +13m.2s., eLE = +13m.39s., eLNZ = +13m.43s., eSSE = +13m.56s., iSSSN = +14m.26s., eSSSZ = +14m.38s., iSSSE = +14m.41s., iE = +15m.12s., iN = +15m.29s. and +15m.54s., iS_cSN = +16m.41s., S_cSEZ = +16m.51s. ; T_0 = 2h.1m.25s.
Belgrade e = +10m.9s., +13m.59s., and +16m.42s.
Hong Kong PP = +8m.17s., ? = +9m.2s., SS = +14m.32s., SSS? = +16m.27s.
Upsala iPPE = +8m.31s., iPPPPE = +9m.5s., i = +16m.14s., and +16m.33s.
Vienna iE = +9m.10s., PKP = +9m.36s., iN = +11m.38s., PP = +12m.40s., SKP = +13m.15s., iEN = +14m.31s., iPPP = +16m.37s., iE = +17m.22s., iN = +17m.52s. and +18m.43s., iE = +19m.28s., SKKS = +19m.48s., iPS = +25m.22s., PPS = +28m.25s.
Zagreb eZ = +8m.37s., e = +8m.55s., eNE = +9m.7s., eZ = +10m.40s., +12m.30s., and +12m.45s., eNW = +16m.55s., iNE = +17m.4s., eNE = +17m.43s.
Prague PP = +9m.8s.?, iPPP = +10m.23s.
Zi-ka-wei iZ = +8m.49s. = PP − 9s., +10m.26s., +15m.13s., +17m.6s., and +17m.54s.
Potsdam iN = +7m.41s., iPPE = +8m.44s., iE = +8m.54s., iPPPE = +9m.27s., iEN = +9m.59s. and +10m.27s., iE = +10m.49s., iN = +10m.54s., iE = +11m.0s., iN = +11m.16s., iE = +11m.27s., iEN = +15m.5s., iN = +16m.49s. and +16m.59s., iEN = +17m.10s.
Triest i = +9m.24s. and +17m.11s. = S_cS − 48s.
Copenhagen iZ = +8m.51s. = PP − 17s., +9m.30s., +10m.31s., +15m.5s., +17m.1s., and +17m.15s. = S_cS − 46s.
Cheb i = +9m.32s. and +10m.39s., e = +15m.18s., i = +17m.15s. = S_cS − 46s.
Jena iE = +9m.32s., iSZ = +14m.9s., eE = +15m.13s., iEN = +17m.13s.
Venice +14m.19s.
Treviso PP = +8m.6s., PPP = +8m.35s., SS = +17m.22s.?
Hamburg iPPPZ = +9m.39s., eSSSE = +17m.28s.
Göttingen iPE = +7m.51s., ePPEZ = +9m.38s., eE = +10m.49s., iSEN = +14m.12s., eEN = +15m.31s.
Florence PP = +9m.13s., i = +14m.55s. and +15m.43s., SS = +17m.25s., i = +17m.55s., SSS = +19m.43s.
Stuttgart ipPEZ = +8m.47s., ePPEZ = +9m.49s., esS = +15m.57s., eSS = +17m.25s. = S_cS − 50s., esSS = +18m.55s.
Strasbourg iP = +8m.58s., iPP = +9m.59s., iPPPP = +11m.4s., sS = +16m.5s., i = +17m.31s., iSS = +18m.13s., iSSS = +19m.35s.
De Bilt iZ = +9m.3s. = PP − 49s. and +12m.11s.
Uccle i = +16m.21s., +17m.46s. = S_cS − 47s., +19m.18s., and +19m.49s.
Carloforte ePN = +8m.34s.
Manila SSE = +18m.47s.
Paris PPE = +10m.28s., SSN = +17m.56s.
Kew ipP = +9m.30s., esS = +17m.7s., iS_cS = +18m.6s., eSS = +19m.34s., esSS = +20m.54s.
Durham +18m.5s.
Oxford i = +18m.8s. and +20m.57s.
Sumoto eSN = +15m.49s.
Stonyhurst i = +19m.59s. and +20m.53s.
Edinburgh i = +17m.24s., +20m.13s., and +20m.55s.
Bidston e = +17m.23s., +18m.18s., and +21m.18s.
Nagoya eS = +10m.13s. = PP − 27s. ; true S is given as the P of a second shock, for which eS is given as +17m.48s.
Algiers iP = +9m.40s., PP = +10m.56s., PPPE = +11m.25s.
Mizusawa P is given as the S of a local shock, the P being given as ePE = +7m.35s. and ePN = +7m.42s.
Batavia i = +16m.13s.
Almeria PP = +10m.15s., PS = +19m.49s.
Toledo i = +10m.12s., PP = +11m.15s., PPP = +12m.13s., i = +18m.31s.
Granada P_cP = +10m.20s., PP = +11m.41s., PPP = +12m.22s.
Tananarive EN = +14m.1s., PSN = +18m.4s., PSE = +18m.58s., SSN = +21m.40s.
San Fernando S = +17m.37s.
Dakar PS = +22m.13s.
Perth P and S are recorded as S and L.
Sitka iPS = +23m.21s., eSS = +27m.58s.

Continued on next page.

Cape Town +28m.18s., +31m.24s., and +40m.27s.
Toronto i = +26m.50s.
Adelaide i = +27m.17s.
Madison i = +24m.16s. and +25m.2s., eSS = +27m.5s.
Melbourne i = +27m.48s. and +31m.48s.
Riverview iN = +24m.49s., iEN = +32m.19s.
Tinemaha iZ = +18m.1s.
Mount Wilson iZ = +18m.16s. =PP −32s. and +18m.34s.
Pasadena eZ = +17m.28s., iZ = +18m.34s.
Tucson e = +41m.13s. ?
San Juan e = +26m.7s. and +27m.47s., iPS = +28m.29s.
La Paz PP = +22m.39s., iPPS = +33m.50s., iSS = +39m.39s., isSS = +41m.13s.
La Plata PPS = +33m.49s.
Huancayo ePP = +21m.57s., i = +22m.43s., and +23m.32s., eSS = +40m.10s.

Jan. 9d. Readings also at 1h. (La Plata), 2h. (Mount Wilson, Pasadena, Tinemaha, Mizusawa, and near Tyosi), 4h. (Andijan and Tchimkent), 5h. (Ukiah), 7h. (San Juan), 8h. (Andijan, Bombay, and Calcutta), 10h. (Almata and near Andijan), 12h. (Nagoya, near Osaka, Kobe, and Sumoto), 13h. (near Nagoya), 14h. (Lick and near Apia), 15h. (Ksara), 16h. (Mizusawa, Osaka, Nagoya, and near Tyosi), 18h. (La Paz), 21h. (Lick (2)), 23h. (Mount Wilson, Pasadena, La Jolla, Haiwee, and Tinemaha).

Jan. 10d. Readings at 0h. (Berkeley, Branner, Lick, and near Mizusawa), 1h. (Berkeley and near Nagasaki), 2h. (near Batavia and Malabar), 3h. (Andijan, Tchimkent, Hong Kong, Phu-Lien, Tiflis, Bombay, Ekaterinburg, Tashkent, De Bilt, Strasbourg, Lick, Chiufeng, Nanking, Zi-ka-wei, Zinsen, Keizyo, Mizusawa, Osaka, Kobe, Sumoto, and near Nagoya and Nagasaki. A Japanese shock, the phases for which do not fit a determination), 5h. (Berkeley, Lick, near Mizusawa, and Nagoya), 10h. (near Mizusawa), 14h. (Tchimkent and near Andijan), 15h. (Berkeley and Lick), 16h. (Ekaterinburg, Tashkent, Suva, Wellington, and near Apia), 17h. (Berkeley, Ekaterinburg, and Huancayo), 18h. (Baku and Tashkent), 21h. (Tiflis), 23h. (Huancayo and near Balboa Heights).

Jan. 11d. Readings at 1h. (Cincinnati), 3h. (Baku, Tiflis, Tashkent, and Ksara), 5h. (Lick, Tchimkent, and near Andijan), 7h. (Tiflis and near Amboina), 9h. (near Amboina), 10h. (Tyosi and near New Plymouth), 13h. (Tiflis, near Andijan, Tchimkent, near Ksara, and near Zagreb), 14h. (near Mizusawa), 15h. (near Nagoya, near Andijan, Tchimkent, and Tashkent), 17h. (Berkeley (2), Branner, Lick (2), San Francisco, Ukiah, and Tucson), 18h. (Branner, Lick, and Kodaikanal), 20h. (Melbourne, Sydney, and near Riverview), 23h. (near Batavia).

Jan. 12d. 1h. 17m. 52s. Epicentre 10°·5N. 87°·0W. (as on 1929 Aug. 20d.). X.

A = +·051, B = −·982, C = +·182 ; D = −·999, E = −·052 ;
G = +·010, H = −·182, K = −·983.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		7·5	101	e 2 8?	P*	—	—	—	—
Port au Prince		16·4	59	i 3 38	− 8	—	—	—	—
San Juan		21·7	66	i 4 49	+ 1	i 8 45	+ 5	10·6	—
Columbia		24·1	12	(e 8 58)	(+ 6)	e 8 58	PcP	e 12·2	—
Huancayo		25·4	152	5 20	− 4	e 9 34	−14	12·7	—
Florissant	E.	28·5	355	e 5 42	−10	—	—	—	20·6
La Paz		32·8	145	e 6 28	− 2	e 12 8	+20	16·5	19·6
Mount Wilson		37·0	315	i 7 8	+ 2	—	—	—	—
Pasadena		37·0	315	i 7 8	+ 2	—	—	—	—
Haiwee	Z.	38·0	318	e 7 16	+ 1	—	—	—	—
Tinemaha		38·7	319	i 7 24	+ 3	i 17 33	(− 1)	—	—

Additional readings :—
Port au Prince i = +4m.32s.
San Juan i = +4m.59s. =PP +7s., e = +8m.21s.
Huancayo eS = +9m.43s.
Long waves were also recorded at other American, European, and Russian stations.

Jan. 12d. 14h. 10m. 23s. Epicentre 37°·9N. 142°·0E. (given by Tokyo). N.2.

A = −·622, B = +·486, C = +·614; D = +·616, E = +·788; G = −·484, H = +·378, K = −·789.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sendai	0·9	293	0 12	− 1	0 28	+ 5	—	—
Hukusima	1·2	263	0 16	− 1	0 35	+ 4	—	—
Mizusawa	1·4	331	i 0 18	− 2	i 0 36	0	—	—
Mito	1·9	219	0 26	− 2	0 49	0	—	—
Morioka	2·0	340	0 23	− 6	0 46	− 5	—	—
Kakioka	2·2	221	0 28	− 3	0 53	− 4	—	—
Tukubasan	2·3	222	0 29	− 4	0 59	0	—	—
Tyosi	2·3	203	i 0 33	0	0 53	− 6	1·2	1·5
Akita	2·4	320	0 40	P*	1 7	S*	—	—
Kumagaya	2·7	230	0 43	+ 4	1 11	+ 2	—	—
Maebasi	2·8	237	0 38	− 2	1 13	+ 1	—	—
Tokyo	2·9	219	0 42	+ 1	—	—	—	—
Yokohama	3·1	217	0 44	0	1 18	− 2	—	—
Nagano	3·3	248	0 47	0	1 29	+ 4	—	—
Hunatu	3·5	228	0 48	− 2	1 41	S*	—	—
Kohu	3·5	232	0 50	0	1 42	S*	—	—
Misima	3·7	222	0 52	− 1	1 55	S_g	—	—
Numadu	3·7	222	0 52	− 1	1 46	S*	—	—
Omaesaki	4·5	223	1 9	+ 5	2 25	S_g	—	—
Nagoya	4·9	237	e 1 15	+ 5	2 24	S*	—	—
Hatidyozima	5·1	200	1 10	− 3	2 3	− 7	—	—
Kameyama	5·4	237	0 46	−31	1 58	−20	—	—

No additional readings.

Jan. 12d. Readings also at 0h. (near Batavia (4) and Soengei Langka (2)), 1h. (Branner, Berkeley, and Lick), 2h. (Batavia), 10h. (near Malabar and near Mizusawa), 11h. (Andijan), 14h. (near Apia), 15h. (near Tiflis), 18h. (near Medan), 20h. (near Malaga).

Jan. 13d. Readings at 4h. (near Mizusawa, near New Plymouth, and Wellington), 5h. (Berkeley, Branner, Lick, and Tyosi), 6h. (near Berkeley, Branner, Lick, and San Francisco), 7h. (Lick and Tyosi (2)), 8h. (Lick and Berkeley), 9h. (near Mizusawa), 12h. and 13h. (near Manila), 14h. (Perth), 15h. (Huancayo, Melbourne, and Riverview), 16h. and 20h. (Alicante).

Jan. 14d. 2h. 10m. 34s. Epicentre 32°·9N. 130°8E. (as on 1932 Jan. 31d.). R.3.

A = −·549, B = +·636, C = +·543; D = +·757, E = +·653; G = −·355, H = +·411, K = −·840.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki	0·8	258	0 13	+ 2	0 27	+ 6	0·7	0·8
Hukuoka	0·8	335	i 0 10_a	− 1	0 22	+ 1	—	0·4
Koti	2·4	74	e 0 32	− 2	e 1 3	+ 1	e 1·2	—
Sumoto	3·7	65	0 53	0	1 43	S*	—	2·0
Kobe N.	4·1	62	—	—	2 1	S*	—	2·3
Nagoya	5·6	64	e 1 20	0	e 2 54	S_g	—	—

Sumoto gives also SN = +1m.46s.

Jan. 14d. 8h. 30m. 21s. Epicentre 54°·3N. 2°·3W. N.2.

$A = +\cdot583$, $B = -\cdot023$, $C = +\cdot812$; $D = -\cdot040$, $E = -\cdot999$; $G = +\cdot811$, $H = -\cdot033$, $K = -\cdot584$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Stonyhurst		0·5	193	i 0 5	− 2	i 0 11	− 2	—	0·2
Durham		0·6	42	0 11	+ 2	—	—	—	—
Bidston		1·0	207	0 29	S	0 59	?	—	1·1
Edinburgh		1·7	343	e 0 28	+ 4	i 0 54	S_g	—	1·0
Oxford		2·6	166	—	—	i 1 13	S*	—	—
Kew		3·1	157	—	—	i 1 31	S*	—	—
De Bilt		5·0	112	e 1 15	+ 4	—	—	e 2·8	—
Uccle		5·3	128	e 1 35	P_g	—	—	—	—
Göttingen		7·9	105	i 1 51	− 1	i 3 12	− 9	—	3·3
Strasbourg		8·4	128	e 1 56	− 3	e 3 43	+ 9	—	—
Hohenheim	N.	9·0	123	e 2 27	+20	—	—	—	—
Stuttgart	N.	9·0	123	e 2 27	+20	—	—	—	—
Neuchatel		9·3	138	e 2 9	− 2	e 3 48	− 8	—	—

Additional readings:—
Edinburgh i = +57s.
Kew i = +1m.35s. = S_g − 1s.
Strasbourg PPP = +2m.45s., SSS = +4m.48s.

Jan. 14d. Readings also at 0h. (near Bidston and near Wellington), 2h. (Berkeley and Lick (2)), 3h. (Andijan, Berkeley, Branner (2), Lick, and San Francisco), 4h. (Lick), 5h. (Andijan, Bombay, Tchimkent, Tashkent, Ekaterinburg, and Chiufeng), 6h. (Hukuoka, Nagasaki, Koti, near Mizusawa, and near Tyosi), 8h. (Branner, Kobe, and near Sumoto), 11h. (Vienna), 18h. (Andijan (2) and Tchimkent (2)), 19h. (near Medan), 20h. (Branner), 21h. (Bunnythorp and near Wellington), 23h. (near Tyosi).

Jan. 15d. 18h. 2m. 6s. Epicentre 4°·5S. 146°·5E. R.1.

Probable error of epicentre ±0°·15 (as on 1932 Jan. 20d.).

$A = -\cdot831$, $B = +\cdot550$, $C = -\cdot078$; $D = +\cdot552$, $E = +\cdot834$; $G = +\cdot065$, $H = -\cdot043$, $K = -\cdot997$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Palau		16·8	315	4 5	+13	7 10	+13	—	—
Amboina		18·3	272	i 4 11	+ 1	i 7 47	SS	—	—
Riverview		29·7	173	i 6 1	− 1	i 10 58	− 1	15·9	19·1
Sydney		29·7	173	—	—	10 54	− 5	15·7	17·2
Adelaide		31·3	192	i 6 24	+ 7	i 11 39	+15	15·4	20·3
Melbourne		33·3	182	e 7 9?	+35	11 59	+ 4	16·3	19·6
Suva		34·1	117	6 54?	+13	11 24	−44	—	—
Miyazaki		39·1	340	7 23	− 1	13 26	+ 4	—	—
Siomisaki		39·2	347	7 25	0	13 28	+ 4	—	—
Batavia		39·5	269	7 24	− 4	—	—	—	—
Perth		39·7	224	7 19	−10	13 14	−18	—	22·6
Koti		40·0	345	e 7 54?	+22	e 13 39	+ 3	—	—
Sumoto		40·3	347	7 36	+ 1	13 45	+ 4	—	—
Osaka		40·5	347	7 37	+ 1	13 46	+ 2	—	14·6
Kobe	N.	40·6	347	e 7 38	+ 1	e 13 48	+ 3	—	—
Nagoya		40·6	349	7 37	0	(13 48)	+ 3	13·8	—
Kohu		40·8	350	7 41	+ 2	13 53	+ 5	—	—
Kumagaya		41·2	352	7 42	0	13 55	+ 1	—	—
Maebasi		41·4	351	7 43	− 1	13 54	− 3	—	—
Hong Kong		41·4	312	8 19	+35	14 5	+ 8	—	—

Continued on next page.

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Oiwake		41·5	351	7 44	0	14 1	+ 2	—	—
Nagano		41·8	351	7 50	+ 3	14 9	+ 6	—	—
Hukusima		42·6	355	7 56	+ 3	14 15	0	—	—
Zi-ka-wei	Z.	42·9	329	7 58	+ 2	—	—	—	22·7
Mizusawa	E.	43·9	356	i 8 4	0	e 14 30	− 4	—	—
	N.	43·9	356	e 8 2	− 2	e 14 34	0	—	—
Morioka		44·5	356	8 7	− 2	14 42	− 1	—	—
Wellington		44·7	149	7 46	−24	14 4	−42	20·9	—
Nanking		45·0	326	i 8 15a	+ 2	i 14 55	+ 5	—	—
Keizyo		45·8	339	8 20	+ 1	15 5	+ 3	—	—
Zinsen	E.	45·9	338	8 0	−20	15 1	− 2	—	—
Phu-Lien		46·6	306	8 54?	+29	—	—	—	—
Medan		48·4	280	8 16	−23	e 14 32	−66	—	—
Chiufeng		52·6	331	i 9 10a	− 1	i 17 18	+41	24·4	—
Irkutsk		67·0	334	e 10 49	− 3	19 42	− 3	e 29·9	—
Colombo		67·5	280	11 23	(0)	—	—	—	21·1
Bombay		76·1	291	e 11 57	+10	i 21 23	−10	—	—
Andijan		81·1	313	e 12 8	− 6	e 22 14	−13	—	—
Tchimkent		83·4	314	e 12 20	− 5	e 22 42	[− 5]	—	—
Ekaterinburg		91·5	328	—	—	i 23 55	−15	35·9	46·8
Tinemaha	Z.	96·9	53	e 13 17	−12	—	—	—	—
Pasadena		97·0	56	i 13 15	−15	—	—	—	—
Mount Wilson	Z.	97·0	56	i 13 16	−14	—	—	—	—
Tananarive		97·0	250	--	—	e 24 28	{− 2}	—	55·0
Baku		97·9	311	e 17 42	PP	i 27 5	PS	41·3	—
Tiflis	E.	101·7	312	e 17 25	PP	24 16	[−18]	54·9	—
Ksara		109·6	305	e 19 42?	?	29 6	PS	—	—
Florissant		118·3	47	e 4 3	?	e 29 41	PS	e 56·0	—
Strasbourg		123·7	328	—	—	(e 36 54?)	SS	e 36·9	—
La Plata		134·4	151	20 0	[+46]	—	—	—	—
Huancayo		135·3	112	19 5	[−10]	e 29 26	{+31}	—	—
La Paz		139·8	122	i 19 7a	[−14]	—	—	—	—
San Juan		145·2	63	e 19 24	[−10]	—	—	e 68·9	—

Additional readings :—
Amboina iSN = +7m.34s.
Riverview iE = +11m.55s., +13m.5s., and +13m.58s.
Adelaide i = +7m.10s. =PP −4s. and +12m.22s., iSS = +13m.19s.
Melbourne i = +11m.22s.
Batavia i = +8m.53s. =PP −1s. and +10m.4s.
Perth P = +7m.44s., PP = +9m.6s., PP = +9m.25s., PPPP = +13m.54s., SS = +15m.34s., SSS = +16m.9s., SSSS = +16m.44s.
Hong Kong ? = +10m.8s., +17m.22s., and +18m.4s. =S_cS +14s.
Zi-ka-wei iZ = +8m.34s. and +15m.18s.
Wellington i = +10m.33s. =PPP +11s., SS = +18m.6s. =S_cS −4s.
Nanking i = +8m.41s. and +15m.40s., eE = +18m.12s. =S_cS +0s.
Keizyo PP = +10m.12s.
Zinsen eN = +8m.11s., eZ = +8m.20s., PPZ = +10m.12s., PPE = +10m.31s.
Medan i = +8m.25s., +9m.9s., and +10m.22s. =SS −3s.
Chiufeng i = +9m.46s., +17m.59s., and +18m.47s. =S_cS −15s.
Pasadena iZ = +13m.56s.
Mount Wilson iZ = +13m.57s.
Tananarive E = +25m.59s. =PS −14s.
Tiflis SKKSE = +25m.26s., PPSE = +28m.50s.
La Plata e = +22m.18s.
Huancayo i = +22m.35s. =PKS −20s., SS = +39m.29s.
La Paz PP = +22m.54s. =PKS −14s.
San Juan ePP = +23m.30s. =PKS +10s.
Long waves were also recorded at Honolulu T.H., East Machias, and other European stations.

Jan. 15d. Readings also at 0h. (near Manila), 2h. (Andijan, Tchimkent, Chiufeng, Irkutsk, Berkeley, and Lick), 3h. (Lick), 4h. (near Nanking and Taihoku), 5h. (Hong Kong and near La Paz), 7h. (Berkeley), 8h. (Berkeley, Lick, Bozeman, Haiwee, Ukiah, Mount Wilson, Pasadena, Tinemaha, and near Branner), 9h. (Kobe, near Nagasaki, Sumoto, and near Hukuoka), 10h. (Koti and near Andijan), 12h. (Lick, Kobe, and near Sumoto (2)), 13h. (Berkeley, Branner, Lick (2), near Mizusawa, and Tyosi), 14h. (La Paz), 15h. (near Apia), 16h. (Lick and Wellington), 17h. (Wellington), 18h. (Florence), 19h. (Andijan, near Chur, and Zurich), 20h. (Hohenheim, Stuttgart, and near Neuchatel), 22h. (Cheb and near Göttingen), 23h. (near Kobe, Nagoya, Osaka, and Sumoto).

Jan. 16d. 11h. 26m. 49s. Epicentre 38°·8N. 128°·0E. N.3.

A = −·480, B = +·614, C = +·627 ; D = +·788, E = +·616 ;
G = −·386, H = +·494, K = −·779.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Keizyo		1·5	214	0 21	0	0 38	− 1
Zinsen		1·7	222	0 25	+ 1	0 45	+ 1
Heizyo	E.	1·9	278	0 26	− 2	0 47	− 2
Taikyu		3·0	171	—	—	1 30	S_E
Husan		3·8	167	e 1 51	S_E	—	—

Jan. 16d. Readings also at 0h. (Lick and Tiflis), 1h. (East Machias, Lick, Tchimkent, and near Andijan), 2h. (Huancayo, La Paz, Tchimkent, and near Andijan), 4h. (near Mizusawa and Nagoya), 6h. (Wellington), 9h. (Tinemaha, Pasadena, and near Nagasaki), 11h. (Lick and Vienna), 13h. (Lick), 20h. (near Ksara), 22h. (Almata, Tchimkent, Andijan, and Huancayo), 23h. (near Toyooka).

Jan. 17d. 15h. 59m. 58s. Epicentre 40°·3N. 97°·4E. (as on 1932 Dec. 28d.). X.

A = −·098, B = +·756, C = +·647 ; D = +·992, E = +·129 ;
G = −·083, H = +·641, K = −·763.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Irkutsk		12·9	19	e 3 11	+10	e 5 49	+24	7·0	8·1
Chiufeng		14·3	84	e 3 27	+ 8	6 13	+15	7·6	—
Almata		15·5	288	e 3 20	−15	—	—	—	—
Andijan		19·0	280	e 3 38	−41	—	—	—	—
Calcutta		19·3	206	2 35	?	6 17	−95	8·4	—
Agra	E.	20·8	237	4 37	− 1	8 21	− 1	—	14·1
Tchimkent		20·9	285	e 4 36	− 3	—	—	—	—
Phu-Lien		21·1	154	4 2?	−39	—	—	—	—
Tashkent		21·2	282	e 4 41	− 1	(i 8 38)	+ 8	i 11·7	12·1
Hong Kong		22·9	136	9 5	S	(9 5)	+ 2	(12·2)	14·0
Ekaterinburg		28·8	317	e 6 2	+ 8	—	—	15·6	17·6
Bombay		30·0	232	—	—	e 11 2	− 2	—	—
Tiflis		39·1	290	e 7 14	−10	e 13 26	+ 4	e 19·1	—

Additional readings and notes :—
Tashkent e = +4m.44s. and +5m.20s., S is given as the P of a second shock for which iS = +11m.17s. and L and M are as entered above.
Hong Kong ? = +11m.43s. ; S is given as P and L as S.
Long waves were also recorded at Nanking, Tyosi, Kodaikanal, Baku, Pulkovo, and Copenhagen.

Jan. 17d. 18h. 47m. 45s. Epicentre 34°·0S. 57°·0E. (as on 1930 Jan. 17d.). R.2.

A = +·452, B = +·695, C = −·559 ; D = +·839, E = −·545 ;
G = −·305, H = −·469, K = −·829.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tananarive		17·3	329	e 4 5	+ 7	e 7 20	+11	7·6	8·4
Cape Town		31·7	262	5 30	−50	10 48	−43	18·2	—
Kodaikanal		48·3	26	8 37	− 1	15 0	−37	18·4	24·6
Bombay		55·0	19	9 32	+ 3	17 5	− 4	e 28·5	30·4
Hyderabad		55·4	25	9 30	− 2	17 12	− 3	24·2	29·8
Calcutta		63·9	33	9 21	−70	17 55	?	31·9	—
Agra	E.	64·3	22	—	—	e 19 1	−10	—	35·7
Adelaide		65·2	116	—	—	e 29 33	?	e 32·2	35·9
Melbourne		68·6	122	—	—	e 20 3	− 1	32·1	34·7
Ksara		70·6	341	e 11 20	+ 6	20 39	+11	34·7	—
Baku		74·7	355	i 11 42	+ 3	i 21 22	+ 5	36·2	44·4
Riverview		74·9	121	—	—	e 21 51	PS	e 37·2	45·6
Sydney		74·9	121	e 20 39	?	—	—	37·1	39·7
Andijan		76·1	13	e 11 44	− 3	—	—	—	—
Tashkent		76·1	10	i 11 42	− 5	21 26	− 7	e 36·2	42·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis		76·5	351	11 48	− 1	e 21 37	0	e 35·2	42·1
Tchimkent		77·2	9	e 11 43	−10	—	—	—	—
Hong Kong		78·3	53	—	—	21 42	−15	—	47·7
Almata		79·4	16	e 12 11	+ 6	—	—	—	—
Vienna	z.	89·8	335	e 12 58	+ 2	—	—	—	—
Ekaterinburg		90·9	3	e 13 1	− 1	e 23 55	− 9	38·2	53·6
Malaga		90·9	317	—	—	e 33 33	SSS	50·6	55·9
San Fernando		91·8	315	—	—	23 35	[− 8]	47·2	60·2
Chiufeng		92·0	41	13 1	− 6	—	—	e 45·5	—
Stuttgart		93·0	331	e 13 21	+10	—	—	e 58·2	—
Strasbourg		93·5	330	e 13 15	+ 1	—	—	e 42·2	—
Irkutsk		95·6	27	—	—	e 24 0	[− 4]	e 48·2	—
Pulkovo		96·3	348	—	—	e 23 11	?	53·2	57·2
Copenhagen		97·4	338	—	—	32 9	?	54·2	—
Huancayo		115·4	234	—	—	e 29 15	PS	e 46·2	—
Florissant	z.	153·4	290	e 19 51	[+ 5]	—	—	—	—
Tinemaha	z.	175·0	311	i 20 11	[+ 5]	—	—	—	—
Berkeley		176·1	352	e 13 45	?	—	—	—	—

Additional readings :—
Tananarive i = +4m.22s., +7m.11s. =S +2s., +7m.18s.
Cape Town PP? = +7m.5s.
Melbourne e = +21m.1s. =ScS +6s.
Tiflis eN = +12m.1s., ePSN = +21m.49s., SKKSN = +22m.17s., SSN = +26m.51s., eSSSN = +30m.19s.
Ekaterinburg i = +13m.3s. =P +1s., eSKS = +23m.35s., ePS = +25m.3s., e = +29m.50s. =SS −3s.
Chiufeng PP? = +16m.46s.
Strasbourg ePP = +17m.18s., ePPP = +18m.4s.
Irkutsk e = +25m.59s. =PS +2s. and +35m.15s.?
Huancayo e = +35m.51s. =SS +20s. and +35m.59s.
Long waves were also recorded at La Paz, Wellington, Perth, and other European stations.

Jan. 17d. 22h. 16m. 32s. Epicentre 46°·1N. 90°·4E. (see Feb. 13d. 2h.). N.2.

A = −·005, B = +·693, C = +·721 ; D = +1·000, E = +·007 ; G = −·005, H = +·721, K = −·693.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Almata		10·0	258	e 2 26	+ 5	i 4 14	+ 1	—	—
Irkutsk		10·9	51	e 3 15	+42	e 5 0	+24	—	5·7
Andijan		14·1	254	e 3 19	+ 2	—	—	—	—
Tchimkent		15·4	263	3 30	− 4	i 7 58	L	(i 8·0)	—
Tashkent		16·0	260	i 3 38	− 3	e 6 27	−11	i 8·5	9·8
Chiufeng		19·6	99	i 4 26$_a$	+ 1	8 12	+14	9·7	10·7
Ekaterinburg		21·1	312	i 4 45	+ 4	i 8 41	PcP	i 11·2	12·6
Agra	E.	21·3	218	e 4 52	+ 9	—	—	—	—
Nanking		25·9	113	5 21	− 7	8 3	?	17·3	—
Phu-Lien		28·6	147	—	—	11 28?	+46	—	—
Baku		29·7	274	e 6 0	− 2	10 35	−24	e 16·2	21·9
Hyderabad		30·3	203	7 40	PP	—	—	—	20·2
Bombay		30·8	214	e 4 11	?	i 8 11	?	—	—
Tiflis		32·7	279	e 5 4	?	e 9 56	?	i 15·2	—
Pulkovo		37·2	314	7 8	0	e 12 57	+ 3	22·5	—
Kodaikanal		37·6	202	4 6	?	—	—	—	—
Ksara		42·6	273	e 4 26	?	e 10 59	?	—	—
Vienna		48·3	301	—	—	e 16 51	+74	i 25·5	26·5
Stuttgart		52·3	305	e 9 12	+ 3	—	—	e 28·1	32·0

Additional readings :—
Tashkent e = +4m.12s. and +4m.51s., i = +6m.50s. =SS +3s.
Nanking iN = +14m.4s.
Tiflis eE = +11m.45s. =S −1s. and +14m.12s.
Long waves were also recorded at Hong Kong and other European stations.

Jan. 17d. Readings also at 0h. (Kobe, Hong Kong, Phu-Lien, Nanking, Chiufeng, Ekaterinburg, Tashkent, Tiflis, Almata, Andijan (2), and Tchimkent (2)), 1h. (Berkeley, Branner, Lick, Ukiah, and Tucson), 2h. (Berkeley, Branner, Lick, and Tucson), 3h. (Hong Kong), 5h. (Baku, Ekaterinburg, Chiufeng, Tiflis, near Mizusawa, Nagoya, Huancayo, Tyosi, and near La Paz), 6h. (Almata and Andijan), 7h. (Almata, Andijan, and Tchimkent), 8h. (near Apia), 15h. (near Medan), 16h. (Andijan and near Stonyhurst), 18h. (Algiers and Mizusawa), 19h. (Florence), 20h. (Triest), 21h. (Baku, Tashkent, and Tiflis), 22h. (La Paz), 23h. (Hastings).

Jan. 18d. 2h. 35m. 21s. Epicentre 45°·0N. 22°·0E. (as on 1927 May 31d.). X.

A = +·656, B = +·265, C = +·707; D = +·375, E = −·927; G = +·656, H = +·265, K = −·707.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Belgrade	1·1	261	i 0 16k	0·	i 0 31	+ 3	—	0·6
Budapest	3·2	321	1 50	?	—	—	—	—
Zagreb	4·3	283	e 1 1	0	e 1 54	+ 4	—	2·2
Vienna	5·0	312	e 1 15	+ 4	2 52	?	—	3·6
Triest	5·8	279	e 1 14	− 8	i 2 25	− 3	—	—
Venice	6·8	277	i 3 27	S*	e 4 15	?	—	—
Treviso	7·0	279	—	—	e 3 34	S_g	—	—
Padova	7·1	276	3 21	S*	—	—	—	—
Florence	7·8	265	2 50	?	—	—	—	3·6
Stuttgart	9·5	298	e 3 39?	?	—	—	e 5·2	—

Additional readings:—
Belgrade i = +23s.
Zagreb e = +1m.6s., +1m.9s. = P* −1s., +1m.12s., +1m.19s. = P_g −1s., eNE = +1m.27s. and +1m.36s.
Vienna P_g = +2m.0s. = S −8s.
Triest e = +1m.50s. = P_g +0s., eS = +2m.17s., i = +2m.39s., iSS = +2m.45s., and +2m.51s. = S* +0s., iSSS = +2m.57s. and +3m.2s., i = +3m.9s. = S_g +3s. and +3m.27s.

Jan. 18d. 8h. 37m. 52s. Epicentre 32°·0S. 22°·0W. N.3.

A = +·786, B = −·318, C = −·530; D = −·375, E = −·927; G = −·491, H = +·199, K = −·848.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
La Plata	30·0	254	6 6	+ 1	11 14	+10	13·0	—
Cape Town	33·8	105	11 10	S	(11 10)	−53	—	—
La Paz	44·4	280	8 7	− 1	e 14 33	− 8	21·8	28·7
Huancayo	52·7	280	e 9 18	+ 6	i 17 4	+26	—	—
Tananarive	63·1	96	—	—	e 17 22	−94	e 23·6	33·0
San Juan	65·8	314	—	—	e 20 8	+38	e 32·6	—
Stuttgart	85·4	21	—	—	e 28 8?	SS	e 40·1	—
Uccle	86·0	16	—	—	e 22 8?	−70	e 36·1	—
Harvard	87·0	326	—	—	e 23 26	− 1	e 37·1	—
Georgetown	87·4	321	e 12 44	− 1	e 23 20	[+ 4]	e 41·1	—
De Bilt	87·4	16	—	—	e 23 2	[−14]	e 36·1	39·1
Pittsburgh	90·7	320	—	—	e 28 34	?	—	—
Florissant	95·1	314	e 17 19	PP	e 26 8	PS	e 46·1	—
Chicago	95·3	317	—	—	e 21 26	?	e 39·1	—
Tiflis	95·9	44	e 12 39	−46	e 23 24	[−41]	45·1	49·4
Baku	98·2	47	e 14 55	+80	24 26	[+ 9]	39·8	59·1
Pulkovo	101·3	24	—	—	e 25 57	+19	48·1	—
Tashkent	111·4	54	e 23 8	?	e 28 11	PS	e 42·1	59·6
Ekaterinburg	112·6	37	—	—	e 28 9	PS	49·1	—
Irkutsk	136·6	36	18 ·8?	[−69]	e 27 8?	?	e 65·1	—
Chiufeng	145·6	64	e 19 12	[−23]	—	—	—	—

For Notes see next page.

NOTES TO JANUARY 18d. 8h. 37m. 52s.

Additional readings :—
Cape Town P? = +12m.44s., +14m.36s., +15m.15s., +16m.47s., +17m.29s., S? = +22m.47s., +28m.36s., and +32m.47s.
La Paz ipPE = +9m.16s., isPN? = +10m.16s., iSZ = +14m.37s., SN = +14m.45s., isSE = +15m.18s., sSN = +15m.23s., S_0SN = +16m.45s., SSN = +18m.25s. $=S_0S$ +17s., SSSN = +18m.39s., iN = +20m.50s.
Huancayo e? = +8m.32s.
San Juan e = +21m.38s., +24m.1s., and +28m.26s.
Georgetown ePP = +16m.2s., ePS = +24m.8s., eSS = +29m.14s.
De Bilt e = +28m.38s. =SS −24s.
Pittsburgh e = +37m.49s.
Florissant e = +31m.38s.
Pulkovo e = +30m.34s.
Tashkent e = +29m.11s.
Ekaterinburg e = +34m.29s. =SS −25s. and +38m.26s. =SSS −32s.
Irkutsk e = +22m.8s.? =PP +10s.
Long waves were also recorded at Ivigtut, Wellington, Riverview, and other European and American stations.

Jan. 18d. 17h. 15m. 1s. Epicentre 51°·1N. 149°·0E. N.2.

A = −·538, B = +·323, C = +·778 ; D = +·515, E = +·857 ;
G = −·667, H = +·401, K = −·628.

A *depth* of focus 0·070 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	°	m. s.	s.	m. s.	s.	m.
Mizusawa		−1·3	13·2	208	e 2 44	− 3	i 4 51	− 9	—
Chiufeng		−3·7	25·3	257	—	—	e 8 21	−17	—
Irkutsk		−3·9	27·3	290	e 5 3	− 2	e 9 3	− 9	e 12·0
Ekaterinburg		−6·1	48·6	313	i 7 59	+ 6	i 14 23	+10	17·8
Andijan		−6·2	51·9	290	e 8 19	+ 1	—	—	—
Tchimkent		−6·4	52·5	293	e 8 24	+ 3	—	—	—
Tashkent		−6·4	53·3	292	i 8 26	− 2	i 15 18	+ 1	—
Pulkovo		−6·9	58·7	328	i 9 6	+ 1	16 23	− 2	—
Tinemaha		−7·2	63·5	63	i 9 41	+ 3	—	—	—
Haiwee		−7·2	64·4	63	i 9 46	+ 1	—	—	—
Baku		−7·2	64·6	304	—	—	e 17 50	+ 8	25·7
Pasadena		−7·3	65·7	65	i 9 55	+ 2	—	—	—
Tiflis		−7·4	66·3	308	e 9 56	− 1	e 18 3	+ 2	26·0
Theodosia		−7·5	68·1	316	e 10 8	− 1	—	—	—
Yalta		−7·6	69·1	316	e 10 15	0	—	—	—
Göttingen		−7·8	71·7	335	i 10 31	0	—	—	—
Vienna	z.	−7·9	72·7	328	i 10 34	− 3	—	—	—
Stuttgart	z.	−7·9	74·4	333	e 10 45	− 4	—	—	—
Zurich		−8·0	75·8	333	i 10 53	− 4	—	—	—
Chur		−8·0	76·2	333	i 10 55	− 4	—	—	—
Neuchatel		−8·0	76·6	334	i 10 58	− 4	—	—	—
La Paz	N.	—	134·5	53	e 20 50	?	—	—	—

Additional readings :—
Baku eSS = +22m.40s.
Tiflis SKSE = +19m.37s.

Jan. 18d. Readings also at 1h. (near Wellington), 5h. (near Zagreb), 7h. (La Paz), 9h. (near Apia), 10h. (Chiufeng and Tiflis), 12h. (near La Paz), 13h. (near Mizusawa), 14h. (Batavia and near Amboina), 17h. (Berkeley, Lick, and near Andijan), 18h. (Baku, Ekaterinburg, Tashkent, Ksara, Tiflis, and Bombay), 19h. (Batavia and near Amboina), 20h. (Andijan (2), Tchimkent (2), Florence, Prato, Padova, Triest, Sienna, and near Chur), 21h. (Prato, Florence, and Sienna).

Jan. 19d. Readings at 4h. (Baku), 5h. (Zurich, Neuchatel, and near Chur), 6h. (Andijan, Tchimkent, and Manila), 9h. (Huancayo), 11h. (Ekaterinburg, Tashkent, and Tiflis), 18h. (Prato (2)), 19h. (La Paz, Huancayo, Tananarive, Nagoya, and near Tyosi), 20h. (Baku, Ekaterinburg, Tiflis, and Tashkent).

Jan. 20d. 12h. 12m. 13s. Epicentre 36°·5N. 70°·5E. (as on 9d.) X.

$A = +\cdot268$, $B = +\cdot758$, $C = +\cdot595$; $D = +\cdot943$, $E = -\cdot334$; $G = +\cdot199$, $H = +\cdot561$, $K = -\cdot804$.

A *depth* of focus 0·025 has been retained.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Andijan	+0·2	4·5	21	i 1 7	0	1 49	−11	—	2·3
Tashkent	0·0	4·9	350	i 1 12	+ 2	—	—	i 2·2	2·3
Tchimkent	0·0	5·8	353	i 1 32	+10	i 2 38	+10	—	2·8
Almata	−0·2	8·4	34	i 1 56	0	i 3 29	0	—	4·0
Baku	−0·8	16·6	290	e 3 44	+ 5	i 6 50	+16	—	—
Bombay	−0·8	17·7	173	3 54	+ 1	7 6	+ 7	—	—
Hyderabad	−1·0	20·3	157	4 23	+ 1	7 53	+ 1	10·4	14·2
Tiflis	−1·0	20·5	293	4 25	+ 1	e 8 8	+12	e 11·0	—
Calcutta	−1·0	20·8	127	e 4 18	− 9	7 0	−62	8·7	—
Ekaterinburg	−1·1	21·4	345	i 4 32	− 1	i 8 18	+ 6	—	—
Kodaikanal	−1·5	27·0	165	7 2	+97	10 38	+48	12·8	—
Ksara	−1·6	28·3	275	e 6 20?	+45	11 37?	SS	—	—
Pulkovo	−1·9	34·6	327	i 6 30	+ 1	e 13 33	SS	15·3	—

Additional readings :—
Andijan $iP_g = +1$m.15s., $S_g = +2$m.0s.

Jan. 20d. 17h. 44m. 4s. Epicentre 34°·0N. 134°·8E. (as on 1932 Nov. 10d.). R.3.

$A = -\cdot584$, $B = +\cdot588$, $C = +\cdot559$.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Sumoto	0·4	11	0 5	− 1	0 11	+ 1	0·2
Kobe	0·7	25	i 0 9	− 1	0 18	0	0·3
Osaka	0·9	38	0 10	− 3	0 19	− 4	0·4
Nagoya	2·1	57	e 0 34	+ 4	0 56	+ 2	—

Jan. 20d. Readings also at 1h. (Berkeley and Lick), 5h. (Tiflis and near Tyosi), 6h. (near Nagoya), 11h. (New Plymouth), 13h. (near Santiago, near Andijan, Tashkent, and Tchimkent, suggested epicentre 37°53′N. 69°52′E.), 14h. (Ekaterinburg, Hong Kong, and Manila), 15h. (Tashkent), 18h. (near Koti), 21h. (near Amboina), 22h. (La Paz, near Amboina, and near Manila), 23h. (near Mizusawa, Nagoya, Tyosi, and near Wellington).

Jan. 21d. 16h. 23m. 48s. Epicentre 47°·0N. 89°·5E. N.3.

A = +·006, B = +·682, C = +·731 ; D = +1·000, E = −·009 ;
G = +·006, H = +·731, K = −·682.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Almata	9·6	252	i 2 20	+ 4	5 4	S_g	i 5·0	5·4
Irkutsk	10·9	56	e 3 6	+33	e 4 30	− 6	5·3	—
Andijan	13·8	250	e 3 13	0	e 6 10	+24	6·2	6·8
Tchimkent	14·9	260	e 3 27?	0	e 6 54?	L	(e 6·9)	—
Tashkent	15·5	256	i 3 35	0	i 6 30	+ 4	8·3	9·4
Ekaterinburg	20·1	311	i 4 27	− 4	i 8 8	0	i 12·0	—
Chiufeng	20·4	101	i 4 33k	− 1	8 22	+ 8	10·5	12·4
Calcutta	24·5	183	4 18	−57	9 38	+ 6	14·6	—
Nanking	26·8	114	e 5 44	+ 8	—	—	i 14·0	—
Baku	29·0	272	6 0	+ 4	10 58	+10	14·9	—
Bombay	31·2	212	e 6 12	− 4	—	—	—	—
Hong Kong	31·7	133	12 22	S	(12 22)	+51	16·6	18·8
Tiflis	32·0	278	e 6 22	− 1	e 11 44	+ 9	e 14·9	21·5
Kucino	32·5	306	—	—	e 13 42	SSS	—	—
Pulkovo	36·1	314	i 6 54	− 5	e 12 46	+ 8	18·2	21·2
Vienna	47·3	301	i 8 28	− 3	—	—	e 24·2	—
Potsdam	47·4	307	—	—	e 22 0	?	e 23·6	25·2
Stuttgart	51·3	304	—	—	e 20 20	?	e 29·7	—

Additional readings :—
Hong Kong S? = +15m.29s.
Tiflis ePPEN = +7m.24s., eSSEN = +12m.50s.
Stuttgart eE = +26m.51s., eEN = +27m.32s.
Long waves were also recorded at Heizyo, Keizyo, Zinsen, Phu-Lien, and other European stations.

Jan. 21d. 19h. 21m. 14s. Epicentre 34°·0S. 57°·0E. (as on 17d.). R.1.

Probable error ±0°·42.

A = +·452, B = +·695, C = −·559 ; D = +·839, E = −·545 ;
G = −·305, H = −·469, K = −·829.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tananarive		17·3	329	i 3 59	+ 1	i 7 28	+19	—	—
Johannesburg		26·1	280	5 40	+10	9 34	−26	11·6	14·8
Cape Town		31·7	262	6 24	+ 4	11 47	+16	15·0	23·4
Colombo		46·3	32	8 22	− 1	15 6	− 3	21·4	22·9
Perth		48·8	105	8 46	+ 4	15 46	+ 2	—	24·3
Batavia		53·7	70	9 17	− 2	16 47	− 5	24·1	—
Malabar		53·7	72	e 9 17	− 2	16 51	− 1	e 21·8	—
Medan		54·4	55	7 52	−92	i 15 31	−90	—	—
Bombay		55·0	19	9 22	− 7	17 11	+ 2	24·7	30·2
Hyderabad		55·4	25	9 28	− 4	17 13	− 2	23·5	31·0
Calcutta		63·9	33	9 49	−42	17 51	?	29·2	32·3
Agra	N.	64·3	22	10 41	+ 7	19 10	− 1	e 31·5	33·1
Adelaide		65·2	116	i 10 43	+ 3	i 19 21	− 1	i 30·3	34·0
Dehra Dun		67·3	20	11 6	+12	20 6	+18	31·9	34·8
Helwan		68·3	337	10 56	− 4	i 20 2	+ 1	31·4	36·6
Melbourne		68·6	122	11 5	+ 3	20 5	+ 1	31·9	34·2
Ksara		70·6	341	11 17	+ 3	i 20 33	+ 5	—	41·4
Phu-Lein		72·3	49	e 11 19	− 6	20 41	− 7	—	—
Amboina		72·4	83	11 19	− 6	i 20 24	−26	28·8	36·3
Baku		74·7	355	11 36	− 3	i 21 18	+ 1	36·8	49·0
Riverview		74·9	121	e 11 43	+ 3	i 21 17	− 2	35·4	39·1
Sydney		74·9	121	e 11 34	− 6	i 21 16	− 3	37·0	41·8
Tashkent		76·1	10	i 11 43	− 4	i 21 29	− 4	34·8	44·1
Andijan		76·1	13	e 11 42	− 5	21 26	− 7	36·8	—
Tiflis		76·5	351	11 44	− 5	21 34	− 3	32·8	46·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tchimkent		77·2	9	11 48	− 5	21 38	− 7	33·8	—
Manila		77·8	64	i 11 51k	− 6	21 58	+ 6	37·9	44·1
Athens		78·3	335	e 11 56	− 3	21 57	0	e 33·1	50·5
Hong Kong		78·3	53	11 56	− 3	21 46	−11	—	47·8
Almata		79·4	16	e 12 7	+ 2	—	—	—	—
Yalta		81·2	346	12 13	− 1	22 15	−13	28·7	—
Catania		81·4	328	12 14	− 1	22 37	+ 6	e 39·2	53·3
Sebastopol		81·4	346	e 12 10	− 5	e 22 16	−15	30·8	—
Theodosia		81·4	346	12 19	+ 4	22 26	− 5	32·8	—
Simferopol		81·6	346	e 12 13	− 3	e 22 19	−14	31·6	—
Messina		81·7	328	e 12 19	+ 2	i 22 43	+ 9	—	—
Trenta		82·3	330	i 12 11	− 9	i 22 21	−19	34·2	45·2
Christchurch		82·8	139	12 42	+20	22 48	+ 3	38·8	—
Tunis		83·1	324	i 12 43	+19	e 16 46	?	—	—
Naples	N.	84·5	330	e 13 1	+30	e 23 56	PS	47·8	57·8
Taihoku		85·1	55	e 12 36	+ 2	23 20	+11	—	—
Belgrade		85·5	336	12 32a	− 4	i 23 15	+ 2	39·7	45·8
Wellington		85·5	139	12 36	0	23 3	[0]	39·9	43·8
Dakar		85·7	291	12 43	+ 6	23 27	+12	46·8	—
Rome		86·2	329	12 56	+17	—	—	—	—
Algiers		86·8	320	i 12 46	+ 4	i 23 6	[− 6]	i 40·7	49·8
Camerino		86·9	330	12 52	+ 9	—	—	—	—
Nanking		88·0	48	i 12 40k	− 8	23 15	[− 5]	—	49·2
Zagreb		88·0	334	e 12 45	− 3	e 23 34	− 3	e 36·4	58·9
La Plata		88·0	229	12 53	+ 5	23 21	[+ 1]	36·3	—
Chatham Ils.		88·1	145	13 46?	+58	24 46?	+68	43·8	—
Arapuni		88·2	137	—	—	23 28	[+ 7]	41·8	45·8
Budapest		88·2	337	14 46	?	i 23 46	+ 7	36·8	52·8
Florence		88·2	330	i 12 53	+ 4	23 26	[+ 5]	42·8	52·3
Prato		88·3	330	e 12 46	− 3	i 23 46	+ 6	e 37·1	53·8
Triest		88·7	332	12 49	− 2	i 23 32	[+ 8]	37·8	55·2
Laibach		88·7	333	e 12 52	+ 1	e 23 34	[+10]	e 46·1	—
Lemberg	E.	88·7	340	e 12 52	+ 1	e 20 46	?	e 34·1	56·1
	N.	88·7	340	e 12 54	+ 3	e 20 20	?	—	54·3
Venice		89·0	331	i 12 56	+ 3	i 23 30	[+ 4]	—	53·8
Zi-ka-wei		89·0	50	e 12 46	− 7	23 15	[−11]	36·7	54·3
Padova		89·2	331	12 59	+ 5	24 13	+25	—	—
Treviso		89·3	331	i 12 55	+ 1	i 23 47	− 2	44·8	54·1
Alicante		89·8	320	e 12 57	+ 1	i 23 45	− 9	e 44·9	56·8
Vienna		89·8	335	e 12 51	− 5	23 56	+ 2	i 34·1	60·8
Pavia		89·8	329	e 13 3	+ 7	—	—	—	—
Almeria		89·8	318	i 12 53	− 3	e 23 21	[−10]	e 39·8	54·4
Piacenza		89·9	329	13 0	+ 3	23 36	[+ 4]	36·6	56·1
Barcelona		90·7	324	13 9	+ 8	23 50	[+13]	e 41·4	57·4
Granada		90·8	317	i 13 7a	+ 6	i 23 37	[0]	41·6	54·8
Ekaterinburg		90·9	3	i 12 56	− 6	i 23 45	[+ 7]	41·8	44·3
Malaga		90·9	317	i 13 3a	+ 1	i 24 11	+ 7	38·8	54·0
Tortosa		91·1	321	13 10	+ 7	23 41	[+ 2]	40·8	55·6
Kucino		91·2	350	13 5	+ 2	e 24 6	− 1	40·7	59·3
Chur		91·4	330	e 13 1	− 3	e 23 27	[−14]	—	—
San Fernando		91·8	315	13 20	+14	23 46	[+ 3]	43·8	60·3
Chiufeng		92·0	41	12 58a	− 9	25 15	PS	e 44·7	56·8
Prague		92·1	333	i 13 11	+ 4	e 24 39?	+23	e 37·8	49·8
Zurich		92·2	330	e 13 5	− 3	e 24 19	+ 2	—	—
Neuchatel		92·6	329	e 13 7	− 2	e 23 43	[− 5]	—	—
Toledo		92·8	319	13 16	+ 6	i 23 46	[− 3]	e 43·3	53·9
Cheb		92·8	333	e 13 8	− 2	e 23 48	[− 1]	e 37·8	60·8
Bagnères		92·8	324	e 13 12	+ 2	23 59	{+2}	37·8	—
Stuttgart		93·0	331	13 13k	+ 2	i 24 30	+ 6	e 39·8	61·8
Madrid		93·0	320	e 13 10	− 1	i 24 58	PS	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Besançon		93·2	329	e 13 18	+ 6	24 4	{+ 3}	39·8	—
Hof		93·3	333	—	—	e 23 46	[− 6]	e 39·4	61·3
Puy de Dôme		93·5	325	e 13 18	+ 4	—	—	e 34·8	—
Strasbourg		93·5	330	i 13 15	+ 1	i 24 45	+17	38·8	61·3
Karlsruhe		93·6	331	12 26	−48	—	—	e 48·8	—
Jena		93·8	334	e 13 16	+ 1	23 46	[− 8]	e 38·8	47·8
Feldberg	E.	94·5	331	e 13 26	+ 8	e 23 42	[−16]	—	53·7
Potsdam		94·5	335	i 13 14	− 4	i 23 50	[− 8]	e 38·8	58·8
Göttingen		94·9	333	i 13 22	+ 2	e 23 46	[−14]	e 40·8	53·2
Coimbra		95·5	318	e 13 23	0	25 5	+18	—	—
Nagasaki		95·6	54	e 13 16	− 7	e 24 39	− 9	38·8	—
Irkutsk		95·6	27	e 13 17	− 6	e 23 48	[−16]	49·8	53·2
Paris		95·9	329	13 29	+ 4	e 24 59	+ 9	40·8	48·8
Miyazaki		96·2	55	13 23	− 3	23 51	[−16]	—	—
Serra do Pilar		96·3	316	17 22	PP	—	—	—	—
Pulkovo		96·3	348	13 25	− 1	24 49	− 5	44·8	57·0
Zinsen		96·4	48	12 47	−40	e 23 38	[−30]	e 51·1	58·9
Hamburg		96·5	335	e 13 26	− 1	e 23 52	[−16]	e 40·8	63·8
Hukuoka		96·5	54	e 21 1	PPPP	—	—	—	—
Uccle		96·6	330	i 13 31	+ 3	24 13	[+ 4]	38·8	61·6
Taikyu	N.	96·7	51	e 20 27	?	e 24 39	−18	e 47·0	55·3
Keizyo		96·7	49	e 13 19	− 9	e 23 56	[−13]	e 39·0	—
Heizyo		96·9	47	e 13 26	− 3	e 23 42	[−28]	—	57·7
De Bilt		97·3	332	i 13 33	+ 2	e 24 16	[+ 3]	e 40·8	55·0
Copenhagen		97·4	338	13 33	+ 1	25 8	+ 4	39·8	—
Helsingfors		97·8	344	e 13 32	− 1	e 24 15	[0]	e 50·8	—
Hamada		98·3	54	13 35	− 1	24 19	[+ 2]	—	—
Koti		98·6	56	e 13 46?	+ 9	—	—	—	—
Kew		99·1	328	i 13 44k	+ 5	i 24 53	{+ 6}	e 41·8	61·1
Upsala		99·3	343	e 13 40	0	24 20	[− 2]	e 42·8	58·5
Oxford		99·7	328	e 13 40	− 2	e 24 8	[−16]	41·8	63·9
Sumoto	E.	99·9	56	13 41	− 2	24 9	[−16]	e 35·8	70·2
	N.	99·9	56	e 13 0	−43	23 58	[−27]	e 30·8	60·3
Kobe		100·3	56	14 15	+30	e 25 39	+10	—	64·3
Osaka		100·6	56	13 20	−26	24 42	[+13]	41·0	—
Bidston		101·6	329	e 18 6	PP	24 31	[− 2]	32·8	64·3
Liverpool		101·6	329	e 18 1	PP	24 16	[−17]	e 63·8	64·3
Stonyhurst		101·7	329	18 6	PP	i 24 51	[+17]	45·8	69·3
Nagano		103·4	55	13 55	− 4	—	—	—	—
Edinburgh		103·4	330	i 18 29	PP	i 24 41	[− 1]	43·8	62·1
Bergen		104·1	337	15 41?	+99	25 41?	{+17}	33·1	—
Mizusawa	E.	106·7	54	17 51	[−16]	27 54	PS	37·3	—
	N.	106·7	54	17 4	[−63]	27 53	PS	37·8	—
La Paz		107·4	235	e 14 12	− 6	i 24 31	[−30]	54·3	55·8
Huancayo		115·4	234	e 19 35	PP	29 34	PS	47·2	—
Ivigtut		126·4	325	20 59	PP	—	—	50·8	—
San Juan		127·3	268	e 19 12	[+10]	i 31 6	PS	53·2	—
Port au Prince		132·5	264	e 19 6	[− 5]	—	—	—	—
East Machias		136·5	302	e 21 56	PP	—	—	e 53·8	—
Harvard		139·0	298	e 18 59	[−21]	—	—	e 69·8	—
Vermont		140·7	301	i 22 36	PP	e 29 46	{+18}	—	76·1
Fordham		140·9	294	e 19 23	[0]	i 23 16	PKS	e 68·1	79·8
Ottawa		142·5	302	e 19 26	[+ 1]	33 4	SKSP	e 69·8	—
Woodstock		143·0	291	i 19 35	[+ 8]	e 23 14	PKS	—	79·8
Georgetown		143·1	291	i 19 29	[+ 2]	i 26 32	SKS	67·8	—
Charlottesville		144·1	290	19 37	[+ 6]	e 33 16	SKSP	e 60·8	—
Buffalo		144·6	298	i 19 33	[0]	i 22 58	PP	68·8	—
Toronto		145·1	299	i 19 37	[+ 3]	23 43	PKS	e 69·5	79·8
Columbia		145·4	282	i 19 42	[+ 7]	33 12	SKSP	e 61·8	—
Pittsburgh		145·4	294	i 19 37	[+ 2]	—	—	e 61·0	—

Continued on next page.

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Honolulu T.H.		146·7	102	i 19 34	[− 3]	—	—	70·8	—
Ann Arbor		148·3	296	i 19 40	[+ 1]	e 33 58	SKSP	e 71·4	84·9
Chicago		151·2	296	e 19 28	[−15]	33 58	SKSP	e 64·9	—
Madison		152·3	299	i 20 7	{− 2}	e 33 57	SKSP	72·8	—
St. Louis		153·3	289	20 0	[+14]	e 27 9	PPP	e 63·8	88·9
Florissant		153·4	290	i 19 50	[+ 4]	e 30 35	{− 6}	e 82·8	89·3
Little Rock		154·8	280	e 19 53	[+ 5]	i 30 36	{−14}	—	75·8
Sitka		155·4	16	e 20 23	{ 0}	i 34 32	SKSP	—	—
Bozeman		165·1	326	20 7	[+ 8]	e 31 22	{−24}	e 70·4	—
Victoria	E.	165·6	1	20 16	[+16]	45 56	SS	93·8	99·4
	N.	165·6	1	20 5	[+ 5]	46 3	?	94·9	98·3
Seattle		166·3	358	e 24 52	PP	—	—	e 89·8	—
Tucson		169·7	264	20 16	[+12]	e 32 30	{+20}	—	—
Ukiah		174·9	2	i 20 12	[+ 6]	e 31 52	{−45}	71·8	—
La Jolla		175·0	258	e 20 14	[+ 8]	—	—	—	—
Riverside		175·3	271	e 20 8	[+ 2]	—	—	—	—
Pasadena		176·0	273	i 20 7	[0]	—	—	87·8	—
Berkeley		176·1	352	i 20 9a	[+ 2]	—	—	—	—

Additional readings and note :—
Tananarive i = +4m.5s. =PP +0s., E = +4m.18s., iN = +6m.27s., iE = +6m.31s., EN = +7m.37s. =SS +17s., E = +7m.42s., N = +7m.48s., EN = +7m.53s., i = +8m.9s., E = +8m.57s.
Johannesburg Ps = +8m.10s., SS = +10m.16s.
Cape Town +8m.32s., +14m.2s., and +14m.39s.
Batavia iP = +9m.20s., i = +10m.3s., and +16m.58s., iZ = +17m.36s.
Malabar iP = +9m.23s.
Medan i = +8m.58s.
Agra PE = +10m.38s.
Adelaide iPPP = +14m.13s., e = +19m.30s. =PS −3s., i = +20m.53s. =S_cS +24s. and +23m.6s. =SS −23s., iSSS = +26m.41s.
Melbourne PP = +13m.56s., PPP = +15m.26s., PS = +20m.39s., S = +21m.4s. = S_cS +9s., SSS = +27m.49s., SSSS = +29m.18s.
Ksara PPN = +13m.55s., PS = +21m.8s., SS = +25m.24s.
Phu-Lien SS = +25m.12s.
Riverview iP = +11m.46s., iPPN = +14m.34s., iPSE = +21m.53s., SSSE = +29m.49s.
Sydney SS = +29m.34s.
Tiflis iP = +11m.50s., iP_cPEN = +12m.2s., eEN = +13m.54s., eE = +14m.25s., ePPEN = +15m.6s., iN = +17m.29s. =PPPP +8s., SKSN = +21m.46s., SSE = +26m.49s., eE = +30m.52s.
Manila iN = +12m.49s., PPEN = +15m.7s., PSEN = +22m.41s.
Athens iPN = +12m.1s., PP = +15m.0s., PPP = +18m.18s.
Hong Kong PP = +14m.55s., SS = +26m.57s., SSS = +30m.29s., ? = +32m.45s.
Belgrade ePP = +16m.6s.
Wellington i = +19m.55s., SS = +28m.16s., SSSS = +35m.14s.
Algiers iP = +13m.41s., PP = +16m.25s., iPPS? = +24m.46s., SS = +29m.3s.
Nanking PPP = +18m.15s. =PPPP +18s., SKKS = +23m.37s. =S +0s., iZ = +24m.34s. =PS +6s., PKKP = +29m.18s. =SS +7s., SSS = +35m.49s., PPP(Δ >180°) = +38m.6s.
Zagreb e = +13m.6s., +16m.23s. =PP +14s. and +17m.41s. =PPP −16s., eNW = +23m.24s. =SKS +4s. and +23m.45s., eNE = +24m.39s. =PS +11s. and +28m.35s., eNW = +29m.37s. =SS +26s., e = +33m.3s. =SSS +22s.
Arapuni SSS = +34m.46s.? =SSSS −21s.
Budapest i = +14m.50s.
Florence PP = +16m.18s., PPP = +18m.30s., PPPP = +20m.9s., PS = +23m.55s., SS = +29m.16s.
Triest iP = +12m.55s., iPP = +16m.26s., i = +23m.48s. =S +4s. and +24m.48s. =PS +12s., iSS = +29m.23s., SSS = +33m.13s., i = +36m.46s.
Laibach ePP = +16m.27s.
Venice +23m.38s. =S −8s.
Zi-ka-wei iZ = +12m.54s., +13m.0s., +16m.28s. =PP +11s., +21m.12s., +23m.48s. =S +2s., and +24m.48s. =PS +8s.
Vienna iP = +12m.56s., iNZ = +14m.17s., iN = +15m.0s., PP = +16m.37s., iN = +17m.28s., PPP = +18m.55s., iN = +20m.59s., SKS? = +22m.48s., SKKS = +23m.30s. =S −14s., PPS = +25m.3s., SS = +29m.16s.
Alicante iP = +13m.9s., PP = +16m.29s., PPP = +18m.11s., PS = +24m.25s.
Almeria PP = +16m.25s.
Granada PP = +16m.31s.
Ekaterinburg iPP = +16m.36s., iPS = +25m.5s., iSS = +30m.10s.
Malaga P_cP = +13m.28s., PP = +16m.43s., PPP = +18m.51s., SKS = +23m.29s., PS = +25m.18s., PPS = +26m.7s., SS = +30m.25s.

Continued on next page.

Kucino ePP = +16m.32s.
San Fernando P = +13m.20s., PE = +13m.28s., SN = +23m.51s.
Chiufeng PP = +15m.46s.?, PKS = +16m.51s. =PP +10s., i = +18m.33s. = PPP +0s., PPP = +19m.32s., SKS = +20m.23s., i = +20m.46s.?, SKSP? = +23m.19s. =SKS −25s., PS = +26m.43s., PPP = +27m.27s., SS = +35m.52s.
Prague ePPS = +25m.46s. =PS +30s., eSS = +30m.40s.
Zurich e = +23m.42s. =SKS −4s.
Neuchatel ePP = +16m.52s.
Toledo i = +15m.10s., PP = +16m.58s., PPP = +19m.46s., PPPP = +21m.24s., iS = +24m.38s., PS = +24m.49s., SS = +30m.46s.
Cheb ePS? = +25m.46s., eSS = +30m.46s.?
Bagnères ePP = +16m.55s., SKS = +24m.35s. =S +13s., PS = +25m.47s., e = +29m.40s.
Stuttgart iP$_c$PZ = +13m.22s., e = +15m.16s., iPP = +16m.52s., eE = +19m.0s., e = +20m.34s., eSKS = +23m.46s., PS = +25m.56s., eSS = +31m.4s., eSSSS = +38m.6s.
Hof eNE = +25m.46s. =PS +16s. and +31m.16s.
Strasbourg iPP = +17m.16s., i = +20m.53s., iSKS = +24m.1s., iPS = +25m.53s., PPS = +26m.31s., SS = +31m.16s.
Jena eE = +13m.21s., eN = +13m.26s., eE = +15m.16s., eN = +15m.28s., eE = +16m.23s., eN = +18m.46s., eE = +24m.36s. =S +5s., e = +25m.46s. = PS +10s., eN = +31m.17s.
Potsdam iN = +13m.21s., iE = +15m.46s.?, iN = +16m.42s. =PP −19s., iPPNZ = +17m.18s., iN = +24m.46s.? =S +9s., and +25m.48s. =PS +5s., eN = +30m.46s. =SS +4s.
Göttingen e?Z = +12m.22s., ePP = +16m.58s., ePPP = +19m.10s., eEN = +24m.46s. =S +5s., and +25m.52s. =PS +3s., eSSN = +30m.40s., eSSSN = +34m.40s.
Irkutsk e = +16m.13s., ePP = +16m.56s., ePPS = +25m.57s. =PS +0s., SS = +30m.10s.
Paris PPZ = +17m.25s., e = +24m.6s. =SKS +1s.
Pulkovo PP = +17m.8s., SKS = +24m.3s., PS = +26m.6s., PPS = +26m.58s.
Zinsen ePZ = +13m.22s., eE = +14m.38s., eEZ = +26m.2s. =PS −4s., eE = +31m.19s. =SS +8s.
Hamburg iPZ = +13m.29s., iPPEZ = +17m.29s., iPPPZ = +19m.30s., iSKKSE = +24m.22s., ePSZ = +26m.15s., iE = +26m.20s., iN = +26m.25s.
Uccle iPP = +17m.38s., PS = +26m.18s., iSS = +31m.43s.
Taikyu eN = +26m.4s. =PS −5s. and +31m.29s. =SS +14s.
Keizyo eE = +30m.56s.
Heizyo eE = +17m.23s. =PP +4s., +26m.11s. =PS −1s., and +31m.29s. = SS +11s.
De Bilt iZ = +15m.29s., e = +17m.40s. =PP +18s.
Copenhagen +17m.44s. =PP +21s., PPP = +19m.52s., SKS = +24m.12s., PS = +26m.14s., PPS = +27m.13s., SS = +31m.52s., SSS = +35m.28s.
Helsingfors ePKPZ = +17m.4s., ePKPN = +17m.26s., eNZ = +19m.39s., ePPPZ = +20m.32s., ePPPN = +21m.2s., eSKKSN = +25m.15s. =S +8s., ePSN = +26m.43s., ePKKPN = +29m.58s., ePKKPZ = +30m.2s., eSSN = +31m.56s.
Kew iPP = +17m.48s., ePPPE = +20m.3s., eSKSEN = +24m.17s., iSE = +25m.23s., iPSEN = +26m.51s., iSSEN = +32m.23s., eSSSEN = +36m.5s.
Upsala PP = +17m.44s., i = +24m.31s. =SKKS −15s., SKKS = +25m.5s. = S −14s., iPS = +26m.40s., SSN = +31m.44s., SSE = +32m.8s., SSS = +36m.44s.
Oxford iP = +15m.18s., i = +17m.57s. =PP +17s., iS = +24m.26s. =SKKS −15s.
Osaka i = +18m.58s.
Bidston SS = +25m.21s. =S −20s.
Liverpool i = +25m.36s. =S −5s.
Stonyhurst i = +27m.26s. =PS +23s.
Edinburgh i = +24m.55s., +27m.56s. =PS +35s., +28m.54s., and +33m.47s.
Bergen SS = +27m.45s. =PS +16s.
La Paz ePZ = +14m.52s., PPN = +17m.50s., PPPN = +20m.11s., iSKSN = +25m.4s., iSKKSN = +25m.57s., iSN = +26m.33s., PSN = +28m.33s., iSSN = +29m.40s., SS = +34m.17s., SSS = +38m.2s.
Huancayo PP = +19m.54s., eSS = +35m.52s., e = +39m.41s. =SSS +1s.
San Juan ePP = +21m.10s., i = +22m.21s., e = +41m.14s.
Port au Prince i = +20m.8s., e = +21m.39s. =PP +5s., PP = +22m.16s. = PKS −28s.
East Machias iPP = +22m.12s., e = +34m.32s., eSS = +40m.22s.
Harvard e = +21m.4s., ePP = +22m.17s., ePPS = +34m.51s., eSS = +40m.44s., eSSS = +45m.16s., e = +56m.16s., +59m.6s., and +66m.16s.
Vermont i = +38m.46s., e = +42m.36s.
Fordham iPP = +22m.38s., iSS = +41m.9s., iSSS = +46m.29s.
Ottawa eN = +19m.54s., ePP = +22m.45s., eN = +37m.54s., eSSN = +41m.21s., eSSS = +46m.46s., eN = +52m.58s. and +61m.28s.; T_0 =19h.20m.54s.
Georgetown iPPZ = +22m.23s., eSSN = +41m.46s.; T_0 =19h.20m.54s.
Charlottesville PP = +22m.55s., eSS = +41m.40s.

Continued on next page.

Toronto i = +21m.30s., PPE = +23m.2s., PP = +23m.15s. = PKS − 5s., PPS = +35m.23s., SS = +41m.53s., SSS = +47m.8s.; T_0 = 19h.20m.58s.
Columbia ePP = +22m.59s., eSS = +42m.4s., eSSS = +47m.16s.
Pittsburgh i = +19m.41s., iPP = +22m.58s., i = +23m.4s., SS = +42m.2s.
Honolulu T.H. e = +40m.40s.
Ann Arbor iPP = +23m.10s., ePPP = +27m.4s., eSS = +42m.40s., eSSSN = +48m.40s.; T_0 = 19h.20m.42s.
Chicago ePP = +23m.22s.
Madison iSKP = +23m.44s., e = +42m.58s. = SS − 8s.; T_0 = 19h.20m.57s.
St. Louis iPKP$_c$EN = +20m.14s., eSKPEN = +23m.44s., ePPE = +24m.20s., SKKS = +30m.46s. = SKKS + 5s., i?E = +33m.59s. = SKSP − 2s., iPPPP'E = +37m.12s., iPPPSEN = +39m.1s., PPPPP'EN = +39m.33s., SSSN = +49m.11s.; T_0 = 19h.21m.21s.
Florissant iPKP$_3$ = +20m.8s., iPPZ = +23m.46s., iSKSEZ = +27m.14s., eSKKSE = +34m.4s., iEN = +53m.27s. = SSS − 20s.; T_0 = 19h.21m.21s.
Little Rock eN = +20m.4s., ePKP$_3$E = +20m.14s., iPPE = +23m.54s., iSKS = +26m.52s., eSSE = +43m.13s.; epicentre 33°·1S. 57°·5E.
Sitka iPP = +23m.53s., i = +24m.0s., e = +26m.46s. and +26m.56s., i = +37m.5s., +39m.53s., and +43m.29s. = SS − 12s., e = +49m.6s. = SSS − 11s.
Bozeman PP = +24m.55s., eSS = +46m.46s., eSSS = +51m.46s.
Seattle e = +25m.10s.
Tucson ePP = +25m.18s., iPPP = +29m.44s., eSS = +46m.28s.
Ukiah iPP = +25m.36s., e = +29m.21s. = PPP − 16s. and +36m.16s. = SKSP + 8s., eSS = +46m.59s.
La Jolla iE = +25m.45s. = PP + 12s.
Riverside eEN = +25m.44s. = PP + 12s.
Pasadena iEZ = +20m.13s., e = +25m.48s. = PP + 12s.
Berkeley iZ = +20m.13s., iPE = +20m.15s., iE = +20m.29s., eZ = +25m.40s. = PP + 4s., iEZ = +25m.44s., iE = +27m.24s.
Long waves were also recorded at Apia, New Plymouth, Denver, and Durham.

Jan. 21d. Readings also at 3h. (Hong Kong and near Manila (2)), 5h. (Berkeley, Branner, and Lick), 6h. (Berkeley, Branner, Lick, Huancayo, and La Paz), 8h. (near Amboina), 13h. (near Tyosi and near Nagoya), 15h. (Tiflis), 16h. (Kew and Ottawa), 19h. (La Paz and near Andijan), 20h. (Andijan and near Sumoto), 21h. (Göttingen), 22h. (Huancayo), 23h. (Stuttgart and near Manila).

Jan. 22d. Readings at 1h. (Huancayo and near Tyosi), 3h. (Berkeley and Lick), 5h. (Baku, Tiflis, Andijan, Tashkent, near Mizusawa, and Tyosi), 6h. (Huancayo), 7h. (New Plymouth), 10h. (Florence and near Apia), 13h. (Branner (3), Berkeley (2), Lick (3), and San Francisco), 22h. (near Apia).

Jan. 23d. 18h. 14m. 5s. Epicentre 5°·8S. 175°·0E. N.3.

A = −·991, B = +·087, C = −·101; D = +·087, E = +·996; G = +·101, H = −·009, K = −·995.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		15·3	123	e 2 45	−47	4 31	?	—	—
Arapuni		32·3	179	e 5 55?	−30	—	—	—	—
Wellington		35·5	181	4 50	−123	14 55	SS	—	—
Riverview		35·7	216	i 10 10	?	—	—	e 16·9	—
Sydney		35·7	216	e 6 55	0	—	—	9·7	10·6
Melbourne		42·1	217	i 11 43	?	e 14 55	+47	—	—
Adelaide		44·4	225	i 12 42	?	i 16 21	?	—	—
Mizusawa	E.	54·7	328	(e 10 50)	(+16)	e 10 50	P$_c$P	—	—
Perth		60·9	237	14 25	?	—	—	—	—
Nanking		65·5	309	e 11 42	(+27)	—	—	—	—
Hong Kong		65·8	298	20 45	S$_c$S	(20 45)	(+12)	—	25·1
Batavia		67·7	266	i 10 57	+ 1	i 19 36	−17	—	—
Chiufeng		70·8	316	i 12 9$_k$	+53	e 14 24	?	—	—
Pasadena		74·5	53	i 11 38	+ 1	—	—	—	—
La Jolla		74·8	54	i 11 40	+ 1	i 20 57	−21	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverside	75·1	53	e 11 41	0	e 21 1	−20	—	—
Tinemaha	75·4	49	i 11 46	+ 3	i 21 12	−13	—	—
Andijan	103·4	311	e 18 14	PP	—	—	—	—
Tchimkent	105·3	313	e 18 25	PP	—	—	—	—
Tashkent	105·6	312	—	—	e 32 37	?	e 54·6	72·0
Huancayo	107·9	104	i 22 52	?	e 30 59	?	—	—
Ekaterinburg	108·0	329	i 18 24	[+13]	i 24 32	[−32]	—	—
Ivigtut	116·0	21	21 55?	PPP	—	—	39·9	—
Pulkovo	119·8	341	e 18 36	[− 9]	e 25 33	[−17]	—	—
Baku	120·1	314	18 49	[+ 3]	31 20	?	59·3	—
Theodosia	127·3	325	e 19 0	[− 1]	—	—	—	—
Simferopol	128·1	326	e 18 55	[− 8]	—	—	—	—
Copenhagen	128·2	348	i 19 2	[− 1]	—	—	45·9	—
Yalta	128·4	325	e 19 3	[− 1]	—	—	—	—
Sebastopol	128·6	326	e 19 7	[+ 3]	—	—	—	—
Edinburgh	129·8	358	—	—	e 41 55?	?	—	—
Göttingen	132·6	347	i 19 14	[+ 3]	—	—	—	49·9
De Bilt	132·9	352	i 19 15	[+ 3]	—	—	e 44·9	47·7
Ksara	132·9	311	e 19 24	[+12]	—	—	—	76·9
Vienna	133·8	340	e 19 9	[− 4]	—	—	—	—
Kew	134·2	356	—	—	e 43 55?	?	—	—
Uccle	134·3	352	e 19 13	[− 1]	—	—	—	45·9
Stuttgart	135·4	346	i 19 14	[− 1]	—	—	e 48·9	—
Strasbourg	135·9	347	e 19 19	[+ 3]	—	—	e 22·9	—
Paris	136·5	353	e 19 13	[− 4]	—	—	27·9	—
Florence	139·4	341	—	—	e 37 55	?	—	51·9

Additional readings and notes :—
Wellington i = +7m.51s. =PP −16s.
Riverview e = +13m.22s., iN = +15m.23s., iE = +15m.26s.
Perth e = +16m.20s. and +16m.55s.
Huancayo i = +23m.53s.
Ekaterinburg e = +20m.11s., +21m.40s., and +23m.18s., e = +28m.51s. = PS +43s., +32m.1s., and +36m.36s.
Pulkovo i = +21m.23s. and +22m.17s.
Baku PKP = +21m.23s., PKS = +25m.39s. =SKS −12s.
Ksara SKP = +22m.56s. =PKS +10s.
Vienna P_g = +19m.24s., S = +20m.6s. =PP −36s.; the early phases of this earthquake are mistaken for those of a local shock.
Stuttgart iZ = +19m.21s. and +19m.32s.
Strasbourg e = +19m.35s.
Long waves were also recorded at Durham and Cheb.

Jan. 23d. Readings also at 0h. (Phu-Lien, Bombay, and near Calcutta), 1h. (Apia), 2h. (Trenta (2) and Wellington), 4h. (Mizusawa), 5h. (Andijan (2)), 7h. (Tananarive), 8h. (Tchimkent, Andijan, and Chiufeng), 12h. (near Apia, near Mizusawa, and near Sumoto), 18h. (Tashkent), 19h. (Hong Kong, Phu-Lien, Chiufeng, Nanking, Zi-ka-wei, near Hokoto, and near Santiago), 20h. (Baku, Ekaterinburg, Pulkovo, Tashkent (2), Nanking, and Copenhagen), 21h. (Bergen, Berkeley, Toledo, Alicante, near Granada, Malaga, Almería, and near Apia), 22h. (Baku and Ekaterinburg).

Jan. 24d. 1h. 42m. 59s. Epicentre 46°·1N. 8°·2E. N.3.

A = +·686, B = +·099, C = +·721.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Sion	0·6	286	i 0 6	− 3	i 0 13	− 2
Neuchatel	1·2	316	i 0 16	− 1	i 0 30	− 1
Zurich	1·3	12	i 0 17	− 1	i 0 33	0
Ravensburg	1·9	30	e 0 31	+ 3	i 0 56	S*
Strasbourg	2·5	353	e 0 38	+ 2	i 1 12	S*
Stuttgart	2·7	14	e 0 37	− 2	e 1 6	− 3

Additional readings :—
Strasbourg iSS = +1m.17s. =S_g +1s.
Stuttgart eP_g = +46s., e = +1m.16s. =S* −3s., eS_g = +1m.20s.

Jan. 24d. 15h. 39m. 11s. Epicentre 19°·0N. 101°·7W. N.2.

A = −·192, B = −·926, C = +·326 ; D = −·979, E = +·203 ;
G = −·066, H = −·319, K = −·946.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tucson		15·6	330	3 42	+ 6	6 41	+12	7·9	—
Little Rock		17·8	26	i 4 5	+ 1	i 7 25	+ 5	—	—
La Jolla	N.	19·6	318	i 4 35	PP	—	—	—	—
Riverside		20·5	320	e 4 34	− 1	—	—	—	—
Denver		20·9	353	e 4 42	+ 3	e 8 35	+11	—	10·8
Pasadena		21·0	319	i 4 40	0	i 12 0	?	—	—
St. Louis		22·0	25	i 4 50	− 1	e 8 50	+ 4	—	14·2
Florissant		22·1	24	e 4 50	− 2	i 8 51	+ 3	—	—
Cincinnati		25·0	33	i 5 21	+ 1	i 9 50	+ 9	—	—
Bozeman		27·8	246	—	—	e 11 13	+45	—	—
Ann Arbor		27·8	29	6 25	PP	e 10 19	− 9	—	—
Pittsburgh		28·4	36	e 6 26	PP	11 33	+55	—	—
San Juan		33·7	85	—	—	e 11 49	−12	—	—
Huancayo		40·5	139	7 31	− 5	e 13 31	−13	e 16·8	—
La Paz	N.	48·5	135	i 8 39	− 1	15 52	+12	22·8	—
Sucre		52·2	135	i 9 10	+ 2	—	—	—	—
Copenhagen		87·1	32	—	—	23 7	[− 7]	44·8	—
Pulkovo		92·1	22	—	—	e 23 32	[−13]	43·8	53·3
Ekaterinburg		102·7	11	—	—	24 27	[−12]	48·8	—
Tashkent		119·1	8	—	—	i 25 38	[− 9]	e 62·9	73·7

Additional readings :—
Little Rock iEN = +4m.11s. and +4m.14s.
Denver iE = +9m.18s.
St. Louis ipP = +5m.8s. ; T_o = 15h.39m.8s.
Florissant i = +5m.8s. = PP − 3s.
Cincinnati iEZ = +5m.38s., iZ = +5m.49s. = PP − 1s. and +7m.41s.
Bozeman e = +14m.19s.
Ann Arbor eE = +13m.7s. and +15m.37s., eN = +16m.19s. = S_eS − 13s.
La Paz iSE = +16m.4s.
Ekaterinburg e = +27m.18s. = PS + 4s.
Tashkent e = +29m.41s. = PS − 13s.
Long waves were also recorded at Edinburgh, De Bilt, and Baku.

Jan. 24d. Readings also at 0h. (Berkeley), 3h. (Riverview, Wellington, Pasadena, and near Apia), 4h. (Bombay, Calcutta, Baku, and Ekaterinburg), 6h. (Florence and near Mizusawa), 7h. (Nanking, near Taihoku, and near New Plymouth), 10h. (Chiufeng, Hong Kong, Manila, and near Apia), 11h. (Baku, Ekaterinburg, Tashkent, and Messina), 12h. (near Santiago (2)), 13h. (La Paz, Sucre, La Plata, and near Santiago (2)), 14h. (La Paz, Sucre, La Plata, Huancayo, near Santiago, and Phu-Lien), 16h. (Ottawa), 18h. (Ekaterinburg, Ksara, and near Baku), 19h. (near Taihoku), 21h. (Tananarive, near Mizusawa, Nagoya, and Tyosi), 23h. (near Nagoya).

Jan. 25d. Readings at 0h. (Apia and Berkeley), 2h. (Medan, near Manila (2), near Batavia, Malabar, and Soengei Langka), 4h. (near Tyosi), 6h. (near Medan), 7h. (Almata, Andijan, Tashkent, Ekaterinburg, and near Manila), 8h. (Messina (2) and near Santiago), 9h. (Athens), 10h. (Branner and Lick), 12h. (Adelaide, Riverview, Wellington, Theodosia, and near Yalta), 13h. (Hastings, Bombay, and near Sebastopol), 14h. (Trenta and near Messina), 16h. (near Manila), 17h. (Huancayo, San Juan, Hong Kong, Phu-Lien, Ekaterinburg, and Tashkent), 18h. (Alicante, Toledo, near Almeria, Granada, and Malaga), 20h. (Berkeley, Branner, and Lick), 21h. (Tucson), 23h. (near Yalta).

Jan. 26d. Readings at 0h. (Andijan, near Tyosi, and near Taihoku), 2h. (near Tyosi), 5h. (Huancayo, Almata, near Andijan, Tchimkent, and near La Paz), 9h. (Taranto), 12h. (Edinburgh, Zagreb, Lick, and near Sumoto), 13h. (near Hukuoka), 18h. (near Hukuoka and near Nagasaki), 22h. (near Calcutta and near Sumoto), 23h. (Andijan (2), Tchimkent, Tashkent, Baku, Bombay, Hyderabad, and La Paz).

Jan. 27d. 22h. 36m. 41s. Epicentre 15°·0S. 172°·0W. (as on 1932 Dec. 3d.). R.1.

Probable error ±0°·30.

A = −·956, B = −·134, C = −·259; D = −·139, E = +·990; G = +·256, H = +·036, K = −·966.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Apia		1·2	11	i 0 54	+37	—	—	—	—
Suva		9·7	250	2 19?	+ 2	4 19	+13	5·0	5·3
Arapuni		25·5	203	5 25	0	9 55	+ 5	11·7	12·3
New Plymouth		27·0	204	(5 19?)	−19	—	—	5·3	—
Wellington		28·7	201	5 59	+ 6	11 54	SS	15·3	17·3
Chatham Ils.		29·2	187	—	—	11 19	+28	15·3	16·3
Riverview		38·1	233	i 7 28	+12	13 8	0	e 18·1	21·4
Sydney		38·1	233	e 6 55	−21	i 13 13	+ 5	19·1	20·9
Honolulu T.H.		38·9	21	i 7 25	+ 2	e 13 30	+10	e 15·8	—
Melbourne		44·2	231	e 8 3	− 3	14 33	− 6	21·0	27·5
Adelaide		48·4	237	e 9 27	+48	i 15 38	0	21·3	29·3
Perth		67·1	241	e 12 9	+77	i 20 9	+23	—	33·8
Ukiah		70·4	38	—	—	20 43	PS	e 29·3	—
Berkeley		70·5	40	e 11 15	+ 1	—	—	—	—
Lick		70·6	40	e 11 1	−13	—	—	—	—
La Jolla		70·9	47	e 11 12	− 4	e 21 0	PS	—	—
Pasadena		71·0	45	i 11 13	− 4	i 21 18	PS	i 33·1	—
Manila		72·5	291	11 27k	+ 1	21 13	PS	35·8	—
Tucson		75·2	50	e 11 43	+ 2	e 21 2	−20	33·7	—
Victoria	E.	76·7	31	—	—	(22 12)	PS	22·2	—
Sitka		78·2	19	—	—	i 22 39	PS	e 32·3	—
Batavia		79·9	266	i 11 55	−12	i 13 31	?	—	—
Nanking	Z.	81·2	306	i 12 16k	+ 2	22 36	+ 8	—	45·3
Hong Kong		81·3	296	12 17.	+ 2	22 34	+ 4	33·8	43·7
Bozeman		81·8	38	—	—	e 22 31	− 4	e 34·3	—
Chiufeng		86·4	313	i 12 36k	− 4	i 23 19	− 2	—	—
Medan		90·2	274	e 12 55	− 3	—	—	—	—
Little Rock	E.	90·3	55	e 12 57	− 2	e 23 40	[+ 6]	—	—
St. Louis		93·1	50	e 13 16	+ 4	e 23 45	[− 6]	e 43·1	50·6
Huancayo		93·3	103	e 13 14	+ 1	24 46	+19	e 37·9	—
Florissant		93·6	50	i 13 16	+ 2	e 23 21	[−32]	e 43·2	51·0
Madison		95·0	46	e 13 26	+ 6	e 23 55	[− 6]	43·3	—
Cincinnati		97·5	51	—	—	(e 32 8)	?	e 32·1	—
Irkutsk		98·0	322	e 13 33	− 1	e 24 23	[+ 7]	e 41·3	—
La Paz		98·6	109	i 13 37	0	i 25 18	+ 4	48·6	52·9
Ann Arbor		98·9	48	—	—	e 48 13	?	e 55·3	—
Charlottesville		101·9	54	—	—	e 27 7	PS	e 47·3	—
Toronto		102·2	48	—	—	e 24 33	[+ 8]	48·1	—
Ottawa		105·0	45	—	—	e 24 55	[+ 5]	e 49·3	—
Harvard		108·0	50	—	—	e 28 1	PS	e 48·6	—
San Juan		109·4	75	19 3	PP	25 19	[+ 8]	50·3	—
Kodaikanal		112·3	275	25 34	SKS	(25 34)	[+11]	—	—
Hyderabad		112·7	283	19 19	PP	—	—	39·1	51·2
Agra	E.	114·3	293	19 41	PP	(29 51)	PS	—	29·9
Bombay		118·2	283	e 19 42	PP	—	—	—	—
Andijan		119·1	309	e 18 50	[+ 7]	—	—	—	—
Ivigtut		119·1	27	30 19?	PS ?	—	—	47·3	—
Tashkent		121·3	310	i 18 54	[+ 5]	27 43	{+18}	56·3	68·5
Tananarive		128·4	230	21 19?	PP	e 38 45	SS	e 60·5	64·6
Pulkovo		132·4	345	i 21 33	PP	e 31 57	PS	56·3	86·5
Helsingfors		133·2	349	e 20 15	?	e 24 41	PPP	i 64·5	—
Kucino		133·3	338	e 23 19?	PKS	—	—	e 59·7	73·4
Upsala		134·6	354	i 22 44	PKS	—	—	e 57·3	—
Bergen		134·6	2	e 19 19	[+ 5]	e 39 48	SS	—	—
Baku		135·7	313	e 19 26	[+10]	—	—	61·3	76·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Edinburgh		138·3	10	e 26 19?	SKS	i 40 36	SS	e 55·3	—
Tiflis		138·5	317	e 19 34	[+14]	28 25	{−50}	e 63·3	—
Copenhagen		139·2	357	e 23 6	PKS	—	—	59·3	—
Durham		139·6	8	22 22	PP	—	—	—	67·3
Stonyhurst		140·3	11	—	—	e 41 9	SS	—	—
Bidston		140·6	10	—	—	41 19?	SS	—	—
Hamburg		141·4	359	e 19 33	[+10]	—	—	e 59·3	—
Oxford		142·5	11	19 33	[+ 8]	i 26 19	SKS	—	—
De Bilt		142·9	3	19 29	[+ 2]	—	—	e 59·3	60·6
Kew		143·0	11	i 19 33	[+ 6]	—	—	e 58·3	—
Yalta		143·1	328	e 19 36	[+ 9]	—	—	—	—
Göttingen		143·4	358	i 19 28	[− 1]	—	—	e 67·3	74·3
Uccle		144·1	5	e 19 31	[0]	—	—	e 59·3	—
Cheb		144·7	354	e 20 1	[+28]	—	—	—	97·3
Vienna	Z.	146·1	350	19 37	[+ 1]	—	—	—	—
Budapest		146·2	346	19 41	[+ 5]	—	—	e 73·3	—
Paris		146·2	6	i 19 40	[+ 4]	—	—	47·0	91·3
Stuttgart		146·3	359	e 19 37	[+ 1]	—	—	e 46·3	—
Strasbourg		146·5	0	e 19 37	[0]	—	—	e 46·3	—
Zurich		147·7	0	e 19 41	[+ 3]	—	—	—	—
Besançon		147·7	2	e 19 46	[+ 8]	—	—	e 42·3	—
Neuchatel		148·0	3	e 19 40	[+ 1]	—	—	—	—
Chur		148·2	0	e 19 47	[+ 8]	—	—	—	—
Zagreb		148·5	349	e 19 42	[+ 2]	—	—	—	—
Ksara		148·5	311	19 47	[+ 7]	—	—	74·3	—
Triest		148·9	352	e 19 41	[+ 1]	e 26 46	SKS	e 61·3	89·3
Treviso		149·2	354	19 44	[+ 4]	28 19?	?	63·3	100·3
Venice		149·4	355	19 51	[+10]	—	—	—	—
Piacenza		149·9	357	19 53	[+11]	—	—	—	100·3
Prato		150·9	355	e 19 48	[+ 5]	i 27 19	SKS	—	—
Florence		151·1	355	19 52	[+ 9]	36 19	?	77·3	88·3
Rome		152·9	353	e 20 3	[+17]	—	—	—	—
Toledo		153·0	21	e 19 49	[+ 3]	—	—	e 71·6	—
Tortosa	N.	153·4	13	e 20 1	{−13}	—	—	e 44·3	77·0
San Fernando		155·1	28	20 16	{− 6}	34 19	SKSP	—	91·8
Alicante		155·4	16	e 19 43	[− 5]	—	—	e 49·3	—
Granada		155·6	23	i 19 53a	[+ 4]	—	—	73·1	93·6
Malaga		155·6	25	19 54	[+ 5]	30 41	{−13}	69·7	75·9
Almeria		156·3	21	e 21 7	{+40}	—	—	—	—
Algiers		157·8	11	e 20 25	{− 9}	—	—	90·3	—

Additional readings :—
Wellington PP = +7m.39s., SS = +13m.31s.
Chatham Islands SS = +13m.29s.
Honolulu T.H. e = +7m.36s. and +13m.11s.
Melbourne i = +8m.15s., PP = +10m.1s. = P_cP +5s., iSS = +18m.18s. = S_cS +11s.
Adelaide e = +18m.36s. = S_cS +2s., iS_cS = +19m.19s.
La Jolla iEN = +11m.20s.
Bozeman e = +22m.43s. and +27m.7s. = SS −32s.
Chiufeng i = +13m.7s.
Madison e = +25m.58s. = PS +8s. ; T_o = 22h.36m.41s.
Irkutsk ePP = +16m.57s., ePPS = +26m.39s. = PS +15s., eSS = +30m.19s.
La Paz iPE = +13m.50s., pPE = +15m.48s., PPE = +17m.42s., PPPE = +19m.50s., iSKS = +24m.18s., iPS = +26m.44s., isS? = +28m.2s., SS = +32m.8s., SSS = +35m.40s.
Ann Arbor eN = +48m.31s., eE = +50m.43s.
Charlottesville e = +32m.19s.? = SS −9s.
Toronto e = +22m.36s., i = +32m.36s. = SS +4s.
Ottawa eE = +27m.49s. = PS +11s., e = +33m.31s. = SS +20s.
Harvard e = +29m.7s. and +33m.49s. = SS −2s.
San Juan PS = +28m.19s., eSS = +34m.19s.
Tashkent iPPP = +22m.30s., SKSP = +30m.33s. eSS = +36m.37s.
Pulkovo iPKS = +22m.38s., SS = +39m.13s.
Helsingfors iPPE = +20m.58s., eSSEN = +38m.21s. ; T_o = 22h.36m.27s.
Kucino L_q = +53·3m.

Continued on next page.

Baku e = +22m.14s. =PP +20s., i = +23m.11s. =PKS +15s., e = +33m.47s., i = +40m.40s.
Tiflis PKSEN = +23m.4s., eSKSPE = +32m.40s., eSSE = +39m.40s.
Durham ? = +23m.4s. =PKS −4s.
Hamburg eE = +23m.41s.
Oxford i = +23m.16s. =PKS +1s. and +30m.47s.
De Bilt eZ = +22m.43s. =PP +4s., eE = +41m.31s. =SS +14s., eN = +42m.13s.
Uccle iPP = +22m.50s., e = +32m.19s.?, and +41m.47s. =SS +16s.
Vienna iE = +19m.48s., +20m.39s., +21m.29s., and +23m.34s. =PKS +13s.
Paris e = +21m.7s.
Stuttgart iPKPNZ = +19m.40s., iZ = +20m.9s., iN = +20m.35s.
Strasbourg i = +20m.20s., e = +31m.2s., PS = +34m.1s., e = +38m.46s.
Zagreb i = +19m.51s., e = +20m.19s.?
Ksara ePP = +23m.35s.
Triest i = +19m.47s. and +19m.52s., ePP = +23m.56s.
Treviso iP = +19m.47s.
Florence PP = +24m.7s., PPP = +27m.44s., SS = +43m.19s., SSS = +48m.49s.
Tortosa ePE = +20m.4s.
San Fernando SN = +24m.22s.
Granada PKP_2 = +20m.23s., PKS = +23m.56s., PP = +24m.47s.
Malaga PKP_3 = +20m.24s., PP = +24m.5s., SKS = +26m.55s., PPP = +27m.50s., SS = +43m.12s., SSS = +50m.0s.
Algiers e? = +24m.29s. =PP +25s.
Long waves were recorded at Ekaterinburg, Pittsburgh, and La Plata.

Jan. 27d. Readings also at 1h. (near Messina and Catania), 3h. (Nagasaki), 4h. (Andijan, Theodosia, and Yalta), 9h. (near Sumoto), 10h. (Christchurch, near Hastings, New Plymouth, Wellington, and near Mizusawa), 11h. (Tyosi and near Hukuoka), 12h. (Sydney, Wellington, and Tiflis), 13h. (Chiufeng, near Tyosi, and near Batavia), 14h. (La Paz), 15h. (near Batavia), 16h. (Edinburgh and La Paz), 17h. (Wellington and near Apia), 20h. (2) and 21h. (near Apia), 22h. (Wellington, Suva, Apia, Pasadena, and Stuttgart), 23h. (Andijan, Medan (2), near Batavia (3), Malabar (3), and Soengei Langka (3)).

Jan. 28d. Readings at 0h. (Sucre, La Paz, and near Sumoto), 2h. (Apia (2)), 3h. (Kodaikanal), 6h. (Berkeley and Branner), 10h. (Vienna), 11h. (near Santiago), 16h. (Huancayo, La Paz, and Sucre), 19h. (Berkeley), 20h. (Huancayo), 22h. (Wellington, near New Plymouth, and near Tyosi).

Jan. 29d. 10h. 55m. 1s. Epicentre 18°·5S. 168°·5E. (as on 1932 Jan. 25d.). X.

A = −·929, B = +·189, C = −·317; D = +·199, E = +·980; G = +·311, H = −·063, K = −·948.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview		21·8	222	e 4 45	− 4	i 8 45	+ 3	e 10·7	13·2
Sydney		21·8	222	e 4 53	+ 4	e 8 53	+11	11·0	12·5
Wellington		23·4	168	—	—	i 8 48	−24	11·8	—
Melbourne		28·2	221	—	—	e 10 28	− 7	14·9	15·4
Adelaide		31·2	233	—	—	e 11 23	0	—	19·3
Huancayo		110·1	111	—	—	e 31 59?	?	—	—
Ekaterinburg		115·1	325	—	—	e 29 34	PS	63·0	—
De Bilt		144·0	341	e 19 38	[+ 7]	—	—	e 81·0	—
Stuttgart	z.	145·4	337	e 19 42	[+ 7]	—	—	—	—

Additional readings :—
Riverview iSE = +8m.48s.
Long waves were also recorded at Suva, Baku, Copenhagen, and Uccle.

Jan. 29d. 18h. 5m. 10s. Epicentre 24°·0N. 123°·0E. (as on 1932 Sept. 11d.). X.

A = −·498, B = +·766, C = +·407 ; D = +·839, E = +·545 ;
G = −·224, H = +·341, K = −·913.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		1·7	308	0 25	+ 1	i 0 45	+ 1	—	1·0
Hokoto		3·2	262	e 0 48	+ 2	e 1 21	− 1	e 1·8	—
Zi-ka-wei		7·3	349	e 1 42	− 2	3 22	S*	—	5·1
Nanking		8·9	336	i 2 3	− 3	i 3 38	− 8	4·3	—
Manila		9·6	192	2 21	+ 5	6 14	?	8·5	—
Chiufeng		17·1	342	3 55	0	e 7 16	SS	e 9·2	11·6
Andijan		45·3	305	e 8 14	− 1	—	—	—	—
Bombay	N.	46·7	275	—	—	e 17 50	?	—	—
Tchimkent		47·5	308	e 8 32	0	—	—	—	—
Tashkent		47·6	307	e 8 32	− 1	16 48	?	e 24·0	31·2
Ekaterinburg		55·1	325	e 9 45	+15	e 21 25	?	27·8	—

Additional readings :—
Taihoku iSZ = +49s. =S* +0s.
Zi-ka-wei iN = +3m.46s. =S* +11s., iZ = +4m.10s. =S_E +15s.
Bombay eE = +18m.50s.
Long waves were also recorded at Hong Kong, Phu-Lien, Baku, Pulkovo, and the European stations.

Jan. 29d. Readings also at 0h. (Bergen), 1h. (Medan), 2h. (Cape Town and Yalta), 3h. (Cape Town and La Paz), 6h. (near Athens), 7h. (near Andijan), 8h. (Mizusawa), 9h. (near Baku and near Victoria), 11h. (Apia, near Nagoya, Tyosi, and Mizusawa), 13h. (Berkeley (2), Branner (2), Lick (2), San Francisco, Bozeman, Ukiah, and Tucson), 14h. (Ottawa, Mizusawa, near Nagoya, and Tyosi), 16h. (Apia (2) and Perth), 19h. (Perth), 21h. (Mizusawa).

Jan. 30d. Readings at 1h. (near Taihoku), 3h. (near Tyosi), 4h. (near Amboina), 5h. (Huancayo), 6h. (Baku, Ekaterinburg, Suva, near Apia, and near Tiflis), 7h. (Huancayo, La Plata, La Paz, and Sucre), 13h. (near Apia (2)), 16h. (La Paz), 17h. (Tiflis (2)), 18h. (near Athens), 19h. (near Apia), 20h. (Baku, Ekaterinburg, Chiufeng, Hong Kong, Phu-Lien, Bombay, Calcutta, Medan, and Tashkent), 21h. (Trenta and near Tyosi), 22h. (near Andijan (2)).

Jan. 31d. Readings at 0h. (Berkeley, Branner, and Lick), 2h. (near Mizusawa, Nagoya, and Tyosi), 3h. (near Andijan), 6h. (Riverview), 14h. and 15h. (near Manila), 18h. (near Andijan), 21h. (near Nagasaki).

Feb. 1d. Readings at 1h. (Tiflis), 3h. (near Sumoto and near Manila), 8h. (near La Paz), 9h. (near Mizusawa), 11h. (San Juan), 12h. (near Almeria), 14h. (Huancayo), 15h. (Theodosia, near Yalta (2), Sebastopol, near Apia (2), and near Manila), 16h. (Hastings, near Nagoya, and Tyosi), 23h. (near New Plymouth and Wellington).

Feb. 2d. Readings at 0h. (near Sumoto), 2h. (Amboina and Cape Town), 6h. (Kobe), 7h. (Tucson and Wellington), 8h. (Tiflis), 9h. (Haiwee, Tinemaha, Pasadena, Riverside, and La Jolla), 11h. (Naples (2)), 12h. (Branner), 13h. (Naples, Pasadena, Riverside, Tinemaha, Almata, near Andijan, and near Santiago), 14h. (near Santiago and near Hukuoka), 15h. (near Andijan), 16h. (Almata and near Andijan), 17h. (Alicante, near Almata, and Andijan), 18h. (Tiflis), 20h. (Ekaterinburg, Irkutsk, Chiufeng, and Tashkent), 21h. (Baku, Ekaterburg, Tashkent, Irkutsk, and Tiflis), 22h. (Baku, Tiflis, and near Manila).

Feb. 3d. 3h. 25m. 12s. Epicentre 38°·7N. 117°·9W. (as on 1932 Dec. 29d.). X.

A = −·365, B = −·690, C = +·625; D = −·884, E = +·468; G = −·293, H = −·553, K = −·780.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Lick	3·2	245	e 0 45a	− 1	i 1 23	+ 1	—
Branner	3·6	249	e 0 50	− 1	—	—	—
Berkeley	3·6	257	e 0 50	− 1	e 1 29	− 3	—
San Francisco	3·7	255	e 0 54	+ 1	—	—	—
Ukiah	4·2	277	e 2 5	S*	—	—	—
Tucson	8·6	136	—	—	e 3 53	+14	4·4

Additional readings :—
Lick iE = +1m.17s.
Berkeley eEN = +1m.34s.

Feb. 3d. 22h. 11m. 48s. Epicentre 46°·2N. 152°·4E. N.1.

Probable error of epicentre ±0°·19.

A = −·613, B = +·321, C = +·722; D = +·463, E = +·886; G = −·640, H = +·334, K = −·692.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	10·9	233	i 2 31	− 2	i 4 23	−13	—	—
	N.	10·9	233	e 2 27	− 6	i 4 24	−12	—	—
Tyosi		13·5	224	e 3 17	+ 8	5 26	−13	—	5·7
Nagoya		16·0	232	3 44	+ 3	6 50	+12	—	—
Toyooka	E.	16·9	237	i 3 59	+ 6	i 7 6	+ 7	e 10·5	—
	N.	16·9	237	i 4 1	+ 8	i 7 10	+11	i 10·5	—
Osaka		17·2	234	3 55	− 2	7 0	− 6	—	8·0
Kobe		17·4	235	e 3 58	− 1	i 7 18	+ 7	—	10·9
Sumoto		17·8	234	4 4	0	7 24	+ 4	10·2	11·3
Koti		19·1	235	e 4 21	+ 1	7 53	+ 5	e 11·8	—
Taikyu		20·5	248	e 4 37	+ 2	8 29	+13	—	—
Keizyo		20·6	255	4 37	+ 1	i 8 33	+15	e 12·6	—
Heizyo	E.	20·7	259	4 32	− 5	8 25	+ 5	e 11·4	—
Hukuoka		20·9	241	4 42	+ 3	8 30	+ 6	—	—
Zinsen		20·9	255	4 40	+ 1	8 37	+13	e 10·2	—
Nagasaki		21·9	240	i 4 52	+ 2	8 52	+ 8	—	—
Chiufeng		26·9	270	i 5 38a	+ 1	10 6	− 8	13·6	16·9
Zi-ka-wei	Z.	28·2	249	5 48	− 1	10 58	+23	14·7	17·1
Nanking		29·3	253	6 0a	+ 1	10 42	−11	e 15·4	19·9
Irkutsk		31·4	300	e 6 16	− 1	11 22	− 4	16·2	19·4
Hong Kong		39·0	246	7 22	− 2	13 19	− 2	18·5	24·2
Manila		41·1	230	i 7 41	0	14 54	+61	22·2	26·2
Sitka		43·9	48	—	—	i 14 42	+ 8	e 21·6	—
Phu-Lien		44·9	252	e 8 12	0	—	—	23·2	—
Almata		51·6	296	e 9 12	+ 9	—	—	—	—
Ekaterinburg		53·6	318	i 9 22	+ 4	i 16 52	+ 2	26·5	34·9
Victoria	E.	54·2	55	9 25	+ 2	17 17	+19	25·8	26·4
Andijan		55·8	296	e 9 36	+ 2	e 19 20	(− 3)	—	—
Calcutta		56·2	268	9 9	−28	17 3	−22	30·7	—
Tchimkent		56·6	299	e 9 43	+ 3	e 19 28	(0)	—	—
Tashkent		57·4	298	i 9 47	+ 1	i 17 41	− 1	—	—
Ukiah		59·5	64	e 10 4	+ 3	e 18 16	+ 7	e 27·2	—
Agra	E.	60·3	279	10 7	0	18 9	−11	31·0	—
Berkeley		60·9	65	i 10 12a	+ 1	—	—	—	—
Bozeman		62·5	52	10 24	+ 2	18 50	+ 2	e 33·2	—
Tinemaha		63·8	63	i 10 33	+ 2	e 19 10	+ 5	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Pulkovo		64·0	332	—	—	e 19 1	− 6	35·2	42·2
Haiwee		64·6	64	i 10 37	+ 1	—	—	—	—
Santa Barbara		64·6	66	e 10 32	− 4	—	—	—	—
Pasadena		65·8	65	i 10 43	− 1	i 19 31	+ 1	—	—
Batavia		66·2	231	i 10 28	−19	i 18 55	−40	—	—
Hyderabad		66·4	271	10 49	+ 1	19 34	− 3	31·9	47·4
Riverside		66·4	66	i 10 45	− 3	—	—	—	—
La Jolla		67·2	67	i 10 52	− 1	—	—	—	—
Upsala		67·7	338	e 10 53	− 3	e 19 50	− 3	e 38·2	—
Baku		69·3	308	i 11 7	+ 1	i 20 14	+ 1	34·0	44·4
Bombay		69·4	277	11 6	− 1	20 11	− 3	34·6	37·8
Tiflis		71·1	312	11 19	+ 2	i 20 42	+ 8	e 34·2	45·3
Ivigtut		71·3	10	i 11 20	+ 1	20 34	− 3	35·2	—
Tucson		71·5	63	11 21	+ 1	20 41	+ 2	—	—
Copenhagen		72·7	338	11 24	− 3	20 48	− 5	36·2	—
Theodosia		73·2	319	e 11 31	+ 1	20 59	0	—	—
Yalta		74·1	320	11 37	+ 2	—	—	—	—
Hamburg		75·2	339	e 11 42	+ 1	—	—	e 42·2	—
Madison		75·3	42	i 11 42	0	i 21 19	− 5	—	—
Stonyhurst		77·6	346	—	—	i 21 35	−14	e 44·2	—
De Bilt		77·7	341	e 11 55	− 1	e 21 48	− 3	e 41·2	45·5
Vienna		78·0	332	i 11 58	+ 1	—	—	—	52·2
Florissant		78·1	46	i 11 58	0	e 21 45	−10	e 36·2	40·7
Ann Arbor	N.	78·4	39	—	—	i 21 48	−10	—	—
St. Louis		78·4	46	i 11 59	0	i 21 53	− 5	e 41·6	—
Toronto	N.	79·1	36	e 12 5	+ 2	i 22 2	− 4	e 43·5	—
Uccle		79·1	341	12 0	− 3	e 22 1	− 5	e 42·2	—
Kew		79·5	343	—	—	e 22 4	− 6	40·2	47·4
Belgrade		79·6	328	e 12 5a	− 1	e 22 4	− 7	e 45·9	—
Stuttgart		79·8	337	12 7a	0	e 22 6	− 8	e 42·2	50·4
Riverview		80·0	181	—	—	e 22 50	PS	e 39·4	42·8
Sydney		80·0	181	—	—	e 28 30	?	50·5	51·9
Little Rock		80·3	50	e 12 10	+ 1	e 22 13	− 6	—	—
Strasbourg		80·3	338	i 11 52?	−17	i 21 59?	−20	e 41·2	—
Zagreb		80·3	331	e 12 10	+ 1	e 22 10	− 9	e 41·2	—
Triest		81·2	332	e 12 13	− 1	i 22 19	− 9	e 45·2	—
Zurich		81·2	337	e 12 15	+ 1	e 22 30	+ 2	—	—
Chur		81·4	337	e 12 18	+ 3	e 22 24	− 7	—	—
Paris		81·4	341	i 12 17	+ 2	i 22 27	− 4	33·2	53·2
Treviso		81·6	333	e 12 14	− 2	e 22 37	+ 4	48·2	—
Pittsburgh		81·6	38	—	—	i 22 25	− 8	e 39·5	—
Ksara	E.	81·6	311	12 19	+ 3	22 58	PS	42·2	—
Venice		81·9	333	e 12 19	+ 1	i 22 23	−13	—	—
Neuchatel		82·0	337	e 12 19	+ 1	e 22 31	− 6	—	—
Adelaide		82·1	192	—	—	i 22 25	−13	e 37·8	47·0
Piacenza		83·0	335	12 34	+11	22 32	−15	—	53·5
Prato		83·5	333	e 12 31	+ 5	i 22 45	[− 3]	—	—
Florence		83·6	333	i 12 28	+ 2	22 42	[− 6]	40·2	46·2
Fordham		83·7	34	e 12 28	+ 1	e 22 48	[− 1]	e 43·2	—
Athens		84·1	322	i 12 27k	− 2	i 22 45	[− 7]	37·7	52·2
Georgetown		84·1	37	i 12 29	0	e 22 48	[− 4]	e 36·2	—
Charlottesville		84·2	38	—	—	e 22 57	− 3	e 42·2	—
Rome		85·0	331	e 12 54	+21	e 22 53	[− 6]	—	—
Casamicciola		85·5	330	e 12 39	+ 3	—	—	—	—
Columbia		86·5	42	—	—	e 23 12	[+ 2]	e 40·2	—
Helwan		87·1	312	12 44	0	i 23 8	[− 6]	—	56·6
Tortosa	N.	89·4	339	e 12 58	+ 3	—	—	e 49·2	52·6
Toledo		91·4	342	e 13 3	− 1	e 24 4	− 5	e 43·6	58·0
Alicante		92·0	340	—	—	e 23 27	[−17]	e 51·3	—
Almeria		93·9	341	—	—	e 25 55	PS	e 48·2	—
Granada		93·9	342	i 13 32a	+17	e 23 35	[−20]	49·7	58·6
Malaga		94·5	342	e 13 51	+33	24 9	{− 2}	49·4	53·8
San Fernando		95·1	343	—	—	23 58	[− 4]	53·2	65·2
La Paz		135·2	62	i 19 21	[+ 6]	—	—	—	—

For Notes see next page.

NOTES TO FEBRUARY 3d. 22h. 11m. 48s.

Additional readings :—
Nagoya P_g = +3m.58s.
Osaka i = +4m.14s.
Kobe iP = +4m.2s., iE = +7m.35s.
Sumoto SZ = +7m.32s. =SS +0s.
Koti eEN = +8m.7s.
Keizyo P_cP = +8m.23s.
Zinsen P_cP = +8m.17s.
Chiufeng i = +10m.38s. and +12m.20s.
Zi-ka-wei iZ = +5m.54s.
Manila PPPEN = +10m.38s., SSSSEN = +20m.44s.
Sitka eSS = +18m.3s. =S_cS −2s.
Bozeman S = +18m.56s. =PS +0s., e = +26m.30s.
Pulkovo e = +20m.22s. and +26m.42s.
Tiflis iPS = +21m.15s., SKKS = +21m.56s., eSSE = +25m.17s., eSSN = +25m.48s., eSSS = +29m.0s.
Tucson e = +20m.30s.
Madison ePP = +14m.32s., iS_cS = +21m.37s. =PS −11s., eSS = +26m.9s.
De Bilt eSS = +27m.42s.
Florissant iZ = +12m.30s. and +14m.58s. =PP +10s., iSN = +21m.50s., iN = +22m.8s. and +22m.18s. =PS −7s. ; T_o =22h.11m.48s.
St. Louis iPS = +21m.54s.
Uccle e = +27m.35s.
Kew i = +22m.9s.
Stuttgart e = +33m.12s.
Riverview i = +22m.6s. =S −10s.
Zagreb e = +22m.33s.
Triest iSKS? = +22m.37s.
Adelaide e = +29m.26s.
Florence S = +22m.58s., PS = +23m.57s., SS = +28m.57s., SSS = +32m.52s.
Fordham ePS = +23m.39s., eSS = +28m.12s.?
Toledo SKS = +23m.43s.
Malaga PP = +16m.38s., SKS = +23m.45s., PPS = +25m.45s. =PS +1s.
La Paz iPP = +22m.42s. =PKS −12s.
Long waves were recorded at Wellington, Harvard, East Machias, San Juan, Huancayo, and other European stations.

Feb. 3d. Readings also at 0h. (Sydney and Tiflis (2)), 1h. (Berkeley and Branner), 8h. (Balboa Heights and Berkeley), 10h. (Tchimkent and near Andijan), 11h. (Bombay), 12h. (Berkeley, Casamicciola, and near Naples), 13h. (Tananarive), 16h. (near Sumoto), 21h. (Tchimkent, near Almata, and Andijan).

Feb. 4d. 6h. 18m. 0s. Epicentre 27°·7N. 140°·0E. N.2.

A = −·678, B = +·569, C = +·465 ; D = +·643, E = +·766 ;
G = −·356, H = +·299, K = −·885.

A *depth* of focus 0·080 has been assumed.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.
Nagoya	−0·1	7·9	342	e 1 47	− 4	3 12	− 7	—
Sumoto	−0·1	7·9	328	3 6	S	(3 6)	−13	—
Tyosi	−0·1	8·0	6	i 1 55	+ 3	3 18	− 3	3·3
Koti	−0·1	8·0	318	i 1 46	− 6	e 3 12	− 9	—
Kobe	−0·1	8·1	331	—	—	i 3 12	−12	—
Nagasaki	−0·9	10·1	302	i 3 6	+56	4 51	+57	—
Mizusawa	−1·3	11·4	5	e 2 23	+ 1	i 4 23	+ 7	—
Keizyo	−2·1	14·7	318	5 12	S	(5 12)	− 5	—
Zinsen	−2·2	14·9	315	5 27	S	(5 27)	+ 7	—
Nanking	−3·0	18·9	288	3 34	− 6	6 34	− 2	—
Chiufeng	−3·7	23·2	308	e 4 11	−13	—	—	—
Andijan	−7·6	56·0	302	e 8 42	+ 3	e 15 46	+ 8	—
Tchimkent	−7·8	57·8	304	e 8 54	+ 3	—	—	—
Branner	−9·1	79·2	53	e 11 13	+ 2	—	—	—
Tinemaha	−9·3	82·2	52	i 11 29	+ 1	—	—	—

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.
Haiwee		−9·3	82·8	52	i 11 32	0	—	—	—
Pasadena		−9·3	83·6	54	i 11 35	− 1	—	—	—
Riverside	z.	−9·4	84·3	54	i 11 35	− 5	—	—	—

Additional readings :—
Mizusawa iPE = +2m.26s.
Keizyo iE = +5m.16s.

Feb. 4d. Readings also at 1h. (Trenta), 7h. (Nagoya and near Tyosi), 9h. (Nagoya, and near Tyosi), 10h. (near Naples, Rome, Trenta, and Casamicciola), 11h. (Chiufeng), 15h. (Tiflis).

Feb. 5d. 5h. 30m. 0s. Epicentre 41°·5N. 31°·5E. (as on 1929 April 5d.). X.

A = +·639, B = +·391, C = +·663 ; D = +·522, E = −·853 ;
G = +·565, H = +·346, K = −·749.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Yalta	3·6	33	e 0 51	0	—	—	—	—
Simferopol	3·9	29	e 0 53	− 3	(e 1 43)	+ 3	e 1·7	—
Theodosia	4·5	38	e 1 5	+ 1	e 1 51	− 4	e 2·0	—
Tiflis	10·0	84	—	—	e 4 18	+ 5	e 5·2	6·3
Baku	14·0	89	—	—	e 5 23	−28	e 7·3	8·8
Ekaterinburg	24·2	41	—	—	9 29	+ 2	13·5	—

* Athens also records long waves.

Feb. 5d. Readings also at 0h. (Sebastopol, Theodosia, and Yalta), 1h. (Baku, Ekaterinburg, and Lick), 4h. (Bombay), 5h. (Sebastopol, Theodosia, Yalta, and Stuttgart), 6h. (near La Paz), 15h. (Hohenheim, Stuttgart, near Chur, Neuchatel, and Zurich), 16h. (Almata, Tchimkent, and near Andijan), 17h. (near Almata, Andijan (2), and Tchimkent), 18h. (Bagnères, near Tortosa, and near Manila), 20h. (near Nagoya).

Feb. 6d. 7h. 17m. 8s. Epicentre 32°·9N. 130°·8E. (as on 1933 Jan. 14d.). X.

A = −·549, B = +·636, C = +·543.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hukuoka	0·8	335	i 0 11$_a$	0	i 0 22	+ 1	—	0·4
Nagasaki	0·8	258	i 0 13	+ 2	i 0 28	+ 7	—	—
Koti	2·4	74	e 0 32	− 2	1 2	0	1·3	1·4
Sumoto	3·7	65	1 2	P*	1 50	S*	—·	1·9
Osaka	4·3	64	1 29	P$_g$	2 31	S$_g$	—	3·4
Nagoya	5·6	64	e 1 20	0	3 5	S$_g$	—	—

Kobe records a maximum of long waves.

Feb. 6d. Readings also at 0h. (near Sumoto), 1h. (Andijan, Tchimkent, and near Tiflis), 2h. and 3h. (near Sumoto), 4h. (Berkeley and Lick), 5h. (near Manila 6h. (Berkeley, Branner, Lick, Sucre, La Paz, and near Huancayo), 7h. (Tchimkent, Sydney, and near Andijan), 8h. (near La Paz), 9h. (Branner, Lick (2), Almata, Andijan, and Tchimkent), 12h. (Lick and near Amboina), 13h. (near Amboina (4)), 16h. (near Medan), 18h. (Berkeley).

Feb. 7d. 0h. 12m. 53s. Epicentre 36°·1N. 140°·0E. (as on 1932 Oct. 14d.). X.

A = −·619, B = +·519, C = +·589 ; D = +·643, E = +·766 ;
G = −·451, H = +·379, K = −·808.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Tokyo		0·5	206	0 8$_a$	+ 1	0 16	+ 3	0·3
Tyosi		0·8	118	i 0 10$_a$	− 1	0 19	− 2	0·6
Nagoya		2·7	249	e 0 41	+ 2	1 11	+ 2	—
Mizusawa	E.	3·0	16	e 0 45	+ 2	1 21	+ 4	—
Osaka		3·9	250	0 53	− 3	1 56	S*	2·3

Feb. 7d. 1h. 27m. 40s. Epicentre 32°·7N. 130°·3E. (as on 1931 Dec. 26d.) X.

A = −·544, B = +·642, C = +·540 ; D = +·763, E = +·647 ;
G = −·349, H = +·412, K = −·842.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki	0·4	270	0 14	+ 8	0 30	+20	—	—
Hukuoka	0·9	7	0 12k	− 1	0 26	+ 3	—	0·5
Koti	2·9	73	e 0 31	−10	e 1 8	− 6	1·3	1·4
Sumoto	4·2	65	1 1	+ 1	1 49	+ 1	—	1·9
Kobe	4·5	62	1 7	+ 3	1 56	+ 1	—	2·0
Toyooka	4·7	51	e 1 13	P*	i 2 4	+ 4	—	—
Osaka	4·8	64	1 6	− 2	2 7	+ 4	—	2·8
Nagoya	6·1	64	e 1 22	− 5	2 44	+ 8	—	—

Additional readings :—
Sumoto SZ = +1m.53s., SE = +1m.56s.
Toyooka ePN = +1m.16s.

Feb. 7d. Readings also at 0h. (Wellington), 3h. (Andijan and near Almata), 7h. (near Kobe, Osaka, and Sumoto), 10h. (La Paz), 13h. (near Andijan and near Port au Prince), 14h. (Lick), 16h. (La Paz and Wellington), 19h. (near Tyosi), 21h. (near Mizusawa).

Feb. 8d. 7h. 7m. 16s. Epicentre 48°·8N. 8°·2E. N.2.

Hiller—" Der Herd des Rastaller Bebens am 8 Feb., 1933 " (Gerl. Beit. zur Geophy. Bd. 41 Left 2).

A = +·652, B = +·094, C = +·752 ; D = +·143, E = −·990 ;
G = +·745, H = +·107, K = −·659.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Karlsruhe		0·3	33	(0 3)	− 1	(0 7)	− 1	—	(0·2)
Strasbourg		0·4	233	i 0 0	P_g	0 7	S_g	—	—
Heidelberg		0·6	29	0 12	+ 3	—	—	—	—
Stuttgart		0·6	93	i 0 11a	+ 2	i 0 23	+ 8	—	—
Ravensburg		1·3	137	e 0 25	+ 7	i 0 44	+11	—	—
Zurich		1·4	170	i 0 26	+ 6	i 0 46	+10	—	—
Feldberg		1·5	7	i 0 24	+ 3	i 0 42	+ 3	—	0·8
Neuchatel		2·0	205	i 0 30	+ 1	i 1 2	S_g	—	—
Sion		2·6	193	e 0 53	+16	e 1 22	S_g	—	—
Cheb		3·0	65	e 0 53	P_g	e 1 30	S*	—	1·7
Göttingen		3·0	22	e 0 44	+ 1	i 1 33	S_g	—	1·7
Jena		3·1	46	i 0 44	0	(i 1 28)	S*	i 1·5	1·7
Uccle		3·2	309	e 1 3	P_g	i 1 34	S*	—	—
Paris		3·7	274	e 1 5	P_g	e 1 54	S_g	2·3	—
De Bilt		3·8	332	—	—	e 1 56	S_g	—	—
Grenoble		4·0	206	i 1 7	P*	—	—	—	—
Treviso		4·1	138	1 18	P_g	e 2 21	S_g	—	—
Prague		4·2	70	e 0 24?	?	i 1 22	P_g	—	1·8
Padova		4·2	141	e 2 29	S_g	—	—	—	—
Venice		4·4	138	e 1 9	+ 6	i 2 25	S_g	—	—
Potsdam		4·7	39	e 1 14	P*	i 2 33	S_g	—	—
Puy de Dôme		4·7	231	e 1 27	P_g	2 25	S_g	—	—
Hamburg	N.	4·9	12	—	—	e 2 39	S_g	—	—
Triest		4·9	128	e 1 12	+ 2	—	—	—	2·9
Vienna		5·4	92	1 42	P_g	i 2 17	− 1	—	4·2
Zagreb		6·0	117	e 1 57?	P_g	e 3 10	S_g	—	—
Kew		6·0	300	—	—	e 3 8	S_g	—	—
Budapest		7·4	96	—	—	e 3 59	S_g	—	—

For Notes see next page.

NOTES TO FEB. 8d. 7h. 7m. 16s.

Additional readings and notes :—
Karlsruhe readings have been *increased* by 1m.
Strasbourg PP = +15s., SS = +20s. and +35s., SSS = +52s. and +1m.7s.
Stuttgart i = +14s., i_q = +19s.
Feldberg i = +32s.
Göttingen iP_gEN = +55s., iEN = +59s., iN = +1m.2s.
Jena iEZ = +58s.
Uccle i = +1m.41s. = S_g +1s. and +1m.45s.
Grenoble iP_g? = +1m.11s., i = +1m.28s.
Treviso PP = +1m.52s. = P* −8s.
Potsdam eN = +1m.44s.
Triest eP_g = +1m.31s., iSS = +2m.36s., iSSS = +2m.41s. and +2m.48s.
Vienna P = +1m.45s., P* = +1m.53s., P_g = +2m.4s., PP = +2m.6s., iZ = +2m.24s., i = +2m.29s., PS = +2m.46s., a = +2m.52s., iZ = +2m.57s., S* = +3m.3s., iN = +3m.5s., SS = +3m.22s., iN = +3m.35s.

Feb. 8d. 11h. 24m. 0s. Epicentre 48°·8N. 8°·2E. (as at 7h.). X.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Karlsruhe		0·3	33	−1 1	?	—	—
Strasbourg		0·4	233	e −0 5	−11	i 0 2	− 8
Stuttgart		0·6	93	e 0 7	− 2	e 0 15	0
Ravensburg		1·3	137	—	—	e 0 38	S_g
Zurich		1·4	170	e 0 21	+ 1	e 0 40	S_g
Neuchatel	N.	2·0	205	e 0 30	+ 1	e 0 54	+ 3

Feb. 8d. Readings also at 0h. (La Paz, Sucre, Pasadena, near Andijan, and Tchimkent), 1h. (Tinemaha), 3h. (Branner and Lick), 5h. (near Sumoto), 7h. (Berkeley, Lick, Strasbourg, and near Stuttgart), 8h. (Hohenheim and Stuttgart), 10h. (Pasadena, Tinemaha, Karlsruhe, Neuchatel, Strasbourg (2), Stuttgart (2), and Zurich), 11h. (Lick), 12h. (near Mizusawa), 13h. (Hohenheim, Stuttgart, and near La Paz), 14h. (Karlsruhe, near Ravensburg, Strasbourg, and Stuttgart), 15h. (near Zurich and Neuchatel), 16h. (Huancayo, Tchimkent, near Almata, and Andijan), 21h. (Koti, near Hukuoka, and Nagasaki), 22h. (Suva).

Feb. 9d. 3h. 56m. 56s. Epicentre 31°·6N. 138°·8E. R.1.

Tokyo gives epicentre as 31°·7N. 138°·8E. (as on 1932 Oct. 14d.).

A = −·641, B = +·561, C = +·524 ; D = +·659, E = +·752 ;
G = −·394, H = +·345, K = −·852.

A *depth* of focus 0·050 has been retained.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Hatidyozima	+1·4	1·7	30	0 49	+ 5	1 28	+ 8	—	—
Omaesaki	+1·0	3·0	351	0 56k	− 1	1 45	+ 3	—	—
Siomisaki	+0·9	3·1	306	0 56a	− 1	1 42	0	—	—
Hamamatu	+0·9	3·3	344	0 59	− 1	1 50	+ 2	—	—
Mera	+0·8	3·4	15	0 58	− 2	1 48	0	—	—
Misima	+0·8	3·5	2	1 2	+ 1	1 50	0	—	—
Numadu	+0·8	3·5	1	1 3	+ 2	1 52	+ 2	—	—
Kameyama	+0·7	3·8	330	1 5a	+ 1	1 54	− 1	—	—
Nagoya	+0·7	3·9	339	1 6	0	1 57	− 1	—	2·0
Hunatu	+0·7	3·9	0	1 6	0	1 58	0	—	—
Yokohama	+0·7	3·9	10	1 5	− 1	1 55	− 3	—	—
Gihu	+0·6	4·1	337	1 7	0	2 0	0	—	—
Kohu	+0·6	4·1	358	1 8	+ 1	2 0	0	—	—
Osaka	+0·6	4·1	320	1 5	− 2	2 2	+ 2	—	2·4
Tokyo	+0·6	4·1	11	1 7	0	1 59	− 1	—	2·0

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Wakayama		+0·6	4·1	313	1 13$_a$	+ 6	2 5	+ 5	—	—
Hikone		+0·6	4·2	331	1 14$_a$	+ 6	2 6	+ 3	—	—
Sumoto		+0·5	4·3	312	i 1 7	− 1	i 2 1	− 2	—	2·1
Kobe		+0·5	4·3	317	1 8$_a$	0	2 3	0	—	2·1
Kyoto		+0·5	4·3	325	1 10	+ 2	2 1	− 2	—	—
Tyosi		+0·5	4·5	23	i 1 12	+ 1	2 6	− 2	—	2·1
Tukubasan		+0·4	4·7	13	1 13	0	2 12	+ 2	—	—
Kakioka		+0·4	4·7	14	1 13	0	2 11	+ 1	—	—
Maebasi		+0·4	4·8	3	1 15	+ 1	2 10	− 3	—	—
Koti		+0·4	4·8	296	i 1 13$_a$	− 1	i 2 8	− 5	—	—
Mito		+0·3	5·0	16	1 15	0	2 13	− 2	—	—
Nagano		+0·3	5·1	355	1 17$_a$	0	2 19	+ 1	—	—
Simidu		+0·3	5·1	286	1 15$_a$	− 2	2 15	− 3	—	—
Titizima		+0·2	5·4	147	1 23	+ 3	2 31	+ 8	—	—
Matuyama		+0·2	5·6	296	1 20$_a$	− 2	2 25	− 3	—	—
Wazima		+0·1	6·0	346	1 28	+ 1	2 36	0	—	—
Miyazaki		+0·1	6·2	275	1 31$_a$	+ 1	2 41	0	—	—
Hukusima		0·0	6·3	13	1 29$_a$	− 1	2 41	0	—	—
Hamada		0·0	6·5	303	1 31	− 1	2 42	− 4	—	—
Sendai		0·0	6·9	14	1 36	− 2	2 53	− 3	—	—
Kumamoto		−0·1	7·0	282	1 38	0	2 56	0	—	—
Hukuoka		−0·1	7·3	288	1 41	− 1	3 4	0	—	—
Hukuoka	B.	−0·1	7·3	288	1 38	− 4	3 4	0	—	—
Nagasaki		−0·2	7·7	281	1 43$_a$	− 3	3 10	− 1	—	—
Mizusawa	E.	−0·2	7·8	13	1 48	0	i 3 14	0	—	—
Akita		−0·3	8·2	7	1 50	− 2	3 15	− 6	—	—
Morioka		−0·3	8·3	13	1 53	0	3 23	− 1	—	—
Tomie		−0·3	8·6	280	1 56	− 2	3 16	−15	—	—
Taikyu	E.	−0·5	9·5	300	2 5	− 2	3 49	0	—	—
Keizyo		−0·7	11·4	305	2 28	− 3	4 32	+ 1	6·1	—
Zinsen		−0·7	11·6	304	2 30$_k$	− 3	4 35	− 1	—	—
Sapporo		−0·8	11·7	9	2 36	+ 3	4 39	+ 3	—	—
Nanking		−1·6	17·0	277	3 29	− 5	6 23	− 1	8·6	—
Chiufeng		−2·0	20·2	301	e 3 47	−22	i 5 41	?	—	—
Manila		−2·4	23·6	228	5 30	+48	8 53	+23	—	—
Hong Kong		−2·4	23·8	253	—	—	6 16	?	10·4	13·5
Phu-Lien		−3·2	30·7	257	—	—	7 4?	?	—	—
Irkutsk		−3·4	32·5	320	e 5 54	− 3	e 10 31	−19	12·9	13·5
Tinemaha	z.	−6·2	80·6	52	i 11 35	− 2	—	—	—	—
Pasadena	z.	−6·3	82·2	54	i 11 42	− 3	—	—	—	—
Riverside	z.	−6·3	82·8	54	i 11 49	0	—	—	—	—

Additional readings and note :—
Osaka i = +1m.13s. and +2m.0s.
Tyosi PP = +1m.16s.
Keizyo iE = +2m.33s.
Chiufeng iP = +3m.57s., i = +7m.25s.
Hong Kong SS = +8m.21s.
Irkutsk e = +7m.20s.; readings are given for 13h.
Pasadena eZ = +13m.8s.
Long waves were also recorded at Baku and Ekâterinburg.

Feb. 9d. 15h. 34m. 40s. Epicentre 0°·0 151°·0E. (as on 1931 Aug. 6d.). X.

A = −·875, B = +·485, C = ·000 ; D = +·485, E = +·875 ;
G = ·000, H = ·000, K = −1·000.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	33·1	300	6 26	− 7	11 27	−25	15·0	17·8
Riverview	33·8	180	e 6 46	+ 7	e 10 51	−72	13·3	18·5
Sydney	33·8	180	e 10 50	?	e 13 44	SS	16·7	17·5
Adelaide	36·8	197	—	—	e 13 20	+32	18·6	21·8
Osaka	37·6	339	7 16	+ 4	9 6	P$_c$P	—	10·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Melbourne		38·2	187	i 11 55	?	i 14 33	SS	18·2	21·6
Hong Kong		42·2	305	10 35	?	13 57	−12	23·0	—
Nanking	z.	44·2	319	8 17	+11	e 18 25	(+18)	22·0	—
Batavia		44·5	261	e 8 16	+ 7	—	—	—	—
Perth		46·1	222	13 50	?	17 25	?	23·3	26·8
Wellington		46·6	156	i 7 50	−35	—	—	22·3	—
Phu-Lien		48·1	298	8 20?	−17	—	—	—	—
Chiufeng		51·1	326	e 8 52	− 8	e 16 15	− 1	e 22·0	31·0
Irkutsk		65·2	331	e 10 34	− 6	e 20 20?	(− 9)	e 32·3	—
Bombay		78·9	289	e 11 20	−42	—	—	—	—
Stuttgart		121·2	332	e 15 16	?	—	—	—	—
Karlsruhe		121·4	332	14 19	?	—	—	—	—
Strasbourg		122·0	332	e 15 7	?	—	—	—	—

Additional readings :—
Riverview iN = +6m.54s.
Sydney eS = +13m.44s.
Adelaide e = +16m.34s.
Perth P_cP = +16m.50s., S = +18m.50s., SS = +21m.7s., SSS = +21m.30s., SSSS = +22m.0s.
Chiufeng P = +9m.26s.
Stuttgart e_q = +15m.24s.
Strasbourg iS = +15m.12s.
Long waves were also recorded at Arapuni, Baku, and Ekaterinburg.

Feb. 9d. Readings also at 0h. (Ksara (2) and Tiflis), 1h. (Berkeley, Branner, and Lick), 3h. (Yalta), 4h. (Pasadena and near Amboina), 8h. (Montezuma), 9h. (Lick), 11h. (near Tyosi), 13h. (Berkeley, Lick, and near Branner), 14h. (Berkeley and Lick), 18h. (Bagnères), 19h. (near Batavia and Malabar), 21h. (near Batavia (2)), 22h. (Bagnères).

Feb. 10d. 8h. 45m. 45s. Epicentre 22°·7S. 65°·6W. (as on 1929 May 11d.). X.

A = +·381, B = −·840, C = −·386 ; D = −·911, E = −·413 ;
G = −·159, H = +·351, K = −·923.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sucre		3·7	6	i 0 31	−22	i 1 21	−14	—	—
La Paz	N.	6·6	338	i 1 48$_a$	P*	i 2 38	−10	—	—
Santiago		11·6	202	2 44	+ 1	4 50	− 3	5·6	6·2
La Plata		13·9	153	3 52	+38	7 16	?	8·8	—
Huancayo		14·1	318	e 3 13	− 4	i 5 36	−17	7·1	—
San Juan		41·1	0	—	—	i 13 44	− 9	—	—
La Jolla	N.	74·3	317	e 11 59	+23	—	—	—	—
Riverside		75·1	318	e 11 39	− 2	—	—	—	—
Pasadena	z.	75·7	318	i 11 43	− 1	—	—	—	—
Tinemaha		77·7	320	i 11 54	− 2	—	—	—	—

Additional readings :—
Huancayo i = +3m.40s. and +4m.7s.
San Juan i = +14m.25s., +14m.59s. and +17m.10s.
Pasadena i = +12m.13s.
Tinemaha i = +12m.23s.

Feb. 10d. Readings also at 0h. (near Amboina (2) and near Nagoya), 1h. (San Juan, near Port au Prince, near Amboina, and near Tananarive), 5h. (near Tyosi), 7h. (Nagoya), 8h. (La Paz), 9h. (Florissant), 13h. (Alicante, near Nagoya, and near Tyosi), 14h. (Bombay, Hyderabad (2), Andijan, Tchimkent, Baku, and Ekaterinburg), 17h. (Göttingen, Hohenheim, and Stuttgart), 18h. (Stuttgart), 19h. (Hukuoka), 20h. (Florence, Sienna, near Prato, and near Huancayo), 21h. (near Wellington), 22h. (Huancayo and La Paz), 23h. (La Paz and Sucre).

Feb. 11d. Readings at 3h. (Mizusawa), 4h. (near Tiflis), 8h. (Berkeley and near La Paz), 10h. (Vienna), 20h. (near La Paz).

Feb. 12d. Readings at 0h. (near Hukuoka and Nagasaki), 1h. (near Mizusawa), 3h. (San Juan), 4h. (La Paz, La Plata, Sucre, Hohenheim, and Stuttgart), 7h. (Tyosi), 8h. (Balboa Heights and Tananarive), 10h. (Sebastopol, Yalta, and Vienna), 18h. (Hohenheim, Stuttgart, and Strasbourg), 20h. (Huancayo, La Paz, La Plata, and near Santiago), 21h. (Seatoun).

Feb. 13d. 2h. 49m. 19s. Epicentre 46°·1N. 90°·4E. (as on Jan. 17d.). R.1.

Probable error of epicentre ±0°·23.

A = −·005, B = +·693, C = +·721; D = +1·000, E = +·007; G = −·005, H = +·721, K = −·693.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Almata		10·0	258	e 2 23	+ 2	4 11	− 2	4·7	6·9
Tashkent		16·0	260	i 4 37	+56	i 10 37	?	—	—
Chiufeng		19·6	99	i 4 25a	0	i 8 5	+ 7	9·3	11·7
Ekaterinburg		21·1	312	i 4 43	+ 2	i 8 33	+ 5	11·1	—
Agra	E.	21·3	218	4 39	− 4	8 32?	0	—	—
	N.	21·3	218	4 40	− 3	8 38	+ 6	—	—
Calcutta		23·7	185	5 7	0	9 27	+ 9	e 12·2	—
Nanking		25·9	113	i 5 28	0	i 10 14	+17	e 13·4	16·5
Heizyo	E.	26·7	91	e 5 41	+ 6	—	—	e 13·9	—
Zinsen		28·0	95	e 5 49	+ 2	e 10 50	+18	e 14·6	—
Keizyo		28·2	94	5 48	− 1	10 45	+10	14·0	—
Zi-ka-wei	Z.	28·2	111	i 5 47	− 2	15 27	?	—	17·8
Phu-Lien		28·6	147	e 5 52	− 1	e 11 5	+23	14·7	16·4
Baku		29·7	274	i 6 5	+ 3	e 11 34	+35	16·0	23·2
Hyderabad		30·3	203	6 11	+ 3	11 6	− 3	14·5	19·5
Hong Kong		30·6	133	6 5	− 5	11 15	+ 1	15·3	16·8
Bombay		30·8	214	6 15	+ 3	11 15	− 2	—	19·8
Tiflis		32·7	279	6 31	+ 2	11 57	+11	14·7	24·6
Hukuoka		32·8	98	e 11 39	S	(e 11 39)	− 9	(17·3)	—
Miyazaki		34·4	100	6 43	− 1	—	—	—	—
Sumoto		35·4	93	—	—	16 59	(−15)	22·2	22·5
Kobe		35·4	93	—	—	e 16 27	(−47)	—	22·0
Osaka		35·7	93	7 5	+10	10 24	?	18·5	22·9
Siomisaki		36·5	94	7 5	+ 3	—	—	—	—
Mizusawa	E.	37·3	82	7 15	+ 6	20 4	?	—	—
	N.	37·3	82	8 5	PP	19 57	?	—	—
Kodaikanal		37·6	202	7 7	− 5	12 24	−36	14·7	24·2
Theodosia		37·8	289	e 7 13	0	—	—	—	—
Simferopol		38·6	290	e 7 22	+ 2	—	—	—	—
Yalta		38·8	288	e 7 41	+19	—	—	—	—
Sebastopol		39·1	290	e 17 6	ScS	(e 17 6)	(−30)	—	—
Helsingfors		39·7	316	9 1	PP	i 18 45	(+65)	—	—
Colombo		40·3	197	7 37	+ 2	16 30	SS	24·7	25·5
Manila		40·6	130	7 41	+ 4	13 48	+ 3	19·4	22·7
Ksara		42·6	273	8 0	+ 7	14 40	+25	—	—
Lemberg	N.	43·1	300	7 47	−11	—	—	—	23·4
Medan		43·1	168	e 7 57	− 1	—	—	—	—
Upsala		43·3	316	i 8 0	+ 1	—	—	e 22·7	25·5
Budapest		47·1	299	e 8 41?	+12	—	—	24·7	26·7
Copenhagen		47·4	312	8 31	− 1	—	—	22·7	—
Belgrade		47·4	295	—	—	e 19 19	?	e 24·7	26·7
Helwan		48·1	272	8 34	− 3	—	—	—	35·5
Vienna		48·3	301	8 39	+ 1	15 48	+11	e 20·9	26·7
Potsdam		48·4	308	i 9 41	(−30)	—	—	—	—
Prague		48·6	304	e 10 40	PP	e 19 24	SS	e 25·7	26·5
Bergen		49·0	320	—	—	e 24 36	?	—	26·9
Hamburg		49·5	310	e 8 50	+ 3	—	—	22·7	29·7
Zagreb		49·7	298	e 8 50	+ 1	—	—	e 25·1	—
Cheb		49·8	305	19 45	?	e 23 42	?	e 26·7	26·9
Jena	E.	49·9	306	e 8 50	− 1	e 15 41	−18	e 25·2	27·9
Laibach		50·5	299	—	—	e 24 18	?	—	—

Continued on next page.

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Göttingen		50·5	308	i 8 53	− 2	—	—	—	28·7
Triest		51·2	300	8 42	−18	e 15 33?	−45	e 26·0	28·4
Treviso		52·1	300	9 9	+ 2	16 48	+18	—	32·6
Venice		52·1	300	8 46	−21	—	—	—	—
Stuttgart		52·3	305	e 9 11	+ 2	e 16 25	− 8	e 26·2	32·0
Karlsruhe		52·6	306	9 27	+16	—	—	27·7	—
De Bilt		52·8	310	i 9 15	+ 3	—	—	e 24·7	33·4
Trenta		52·9	291	e 9 1	−12	—	—	—	—
Chur		53·0	303	e 9 15	+ 1	e 19 11	(+ 7)	—	—
Strasbourg		53·2	306	9 15	0	16 56	+11	27·7	29·2
Zurich		53·3	304	e 9 16	0	—	—	—	—
Florence		53·6	299	e 9 9	− 9	17 11	+21	20·7	26·7
Prato		53·7	299	e 9 5	−14	i 11 26	PP	—	13·7
Piacenza		53·9	302	—	—	20 41	SS	28·0	34·0
Uccle		53·9	309	i 9 23a	+ 2	e 17 8	+14	e 25·7	29·9
Batavia		54·4	159	i 11 56	PP	—	—	—	—
Neuchatel		54·5	304	e 9 25	0	—	—	—	—
Durham		54·9	315	21 37	?	28 46	?	—	39·2
Edinburgh		55·1	317	—	—	e 21 11	SS	i 30·2	35·9
Kew		56·0	312	—	—	e 20 41?	SS	25·7	35·7
Paris		56·0	308	i 9 37	+ 1	—	—	29·7	30·7
Bagnères		60·6	303	e 11 56	PP	—	—	32·7	—
Alicante		64·0	299	e 10 45	+13	e 20 36	[+15]	e 34·9	—
Toledo		65·1	302	e 10 33	− 6	20 8	[−21]	e 33·7	39·9
Granada		66·6	300	i 10 47k	− 2	e 20 15	+35	35·6	40·7
Malaga		67·4	300	e 10 43	−11	e 20 11	PS	35·2	37·7
San Fernando		68·7	301	11 8	+ 5	—	—	35·7	39·2
Sitka		70·0	25	e 11 10	− 1	e 20 3	−18	e 33·7	—
Victoria	E.	81·0	22	22 31	S	(22 31)	+ 5	42·7	46·5
Perth		81·4	158	22 21	S	(22 21)	−10	—	—
Tinemaha		92·9	23	e 13 11	0	—	—	—	—
Pasadena		95·7	23	i 13 24	0	—	—	—	—
Riverside	Z.	96·0	23	e 13 28	+ 3	—	—	—	—
Cincinnati		96·1	356	i 13 19	− 7	—	—	e 48·3	—
La Paz		145·4	321	i 19 35a	[0]	i 26 2	PPP	77·0	97·6
Sucre		146·3	315	18 37	[−59]	—	—	—	—

Additional readings and note :—
Ekaterinburg L_q = +10m.17s. ; epicentre 47°·2N. 91°·2E.
Keizyo PP = +6m.21s.
Zi-ka-wei iZ = +13m.23s.
Tiflis e = +7m.46s., PPPE = +8m.9s., eSSE = +13m.9s., eN = +14m.5s.
Hukuoka gives S as P and L as S.
Sumoto eE = +17m.7s. = S_cS −7s., eZ = +18m.56s., eEN = +19m.53s.
Kobe eN = +19m.19s.
Helsingfors iE = +13m.39s. = S +7s., eN = +17m.5s., eS_cSN = +18m.50s., eZ = +19m.57s., eN = +20m.1s., iZ = +20m.11s., iN = +20m.54s., eEZ = +21m.7s.
Ksara PP = +9m.40s. = P_cP −10s., SS = +17m.38s. = S_cS −19s.
Lemberg ePE = +8m.6s.
Medan i = +20m.52s., +23m.53s., +24m.41s., and +26m.9s.
Upsala iE = +9m.45s. = P_cP −8s.
Budapest e = +21m.11s.
Belgrade e = +21m.50s.
Helwan PP = +10m.29s.
Vienna iPZ = +8m.44s., PP = +10m.32s., SS = +19m.10s., SSS = +19m.50s., iE = +22m.2s., iEN = +23m.5s., +24m.6s., iE = +25m.13s., iEN = +25m.48s., iE = +26m.9s.
Bergen e = +26m.1s.
Jena ePN = +8m.53s., iPPE = +10m.52s.
Laibach e = +27m.22s., +28m.13s., and +33m.17s.
Göttingen iPEN = +8m.57s.
Triest SS = +18m.52s. = S_cS +0s., iSSS? = +20m.13s. = SS +30s.
Treviso SS = +25m.13s., SSS = +27m.33s., SSSS = +28m.28s.
Stuttgart ePP = +11m.7s., e = +13m.15s. and +15m.6s., eSS = +20m.26s.
Strasbourg PP = +11m.16s., i = +13m.41s., SS = +21m.4s., SSS = +21m.49s.
Zurich ePP = +11m.18s.
Uccle i = +21m.18s.
Toledo iP = +10m.41s., i = +10m.44s.; PS = +20m.41s.
Granada PP = +14m.5s., PPP = +15m.42s., SS = +25m.53s.

Continued on next page.

Malaga $P_cP = +11m.22s.$, PS = +20m.39s.
Sitka e = +15m.11s. =PPP −1s., +24m.51s. =SS +9s., and +28m.21s.
Cincinnati iZ = +11m.29s. and +19m.9s. =PPP +0s.
La Paz $PKP_2 = +20m.31s.$, isPKP = +21m.33s., iPPN = +23m.8s., iPPE = +23m.21s., ipPPN = +23m.44s.
Sucre PP = +22m.12s.
Long waves were also recorded at Husan, Nagasaki, Taikyu, Koti, Toyooka, Chicago, Tucson, East Machias, Ivigtut, Cape Town, Algiers, and other European stations.

Feb. 13d. 4h. 23m. 34s. Epicentre 46°·1N. 90°·4E. (as at 2h.). X.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Almata		10·0	258	e 3 32	+71	e 5 15	S_g	—	6·4
Andijan		14·1	254	e 3 15	− 2	—	—	—	—
Chiufeng		19·6	99	4 29_a	+ 4	e 8 14	SS	e 9·8	12·0
Ekaterinburg		21·1	312	(i 8 46)	(+ 3)	8 46	P_cP	i 11·2	—
Calcutta		23·7	185	4 58	− 9	8 50	P_cP	10·7	—
Nanking	E.	25·9	113	e 5 34	+ 6	e 10 6	+ 9	e 13·8	—
Hong Kong		30·6	133	—	—	11 47	+33	—	16·9
Bombay	E.	30·8	214	e 9 26	(+14)	—	—	—	—
Tiflis	E.	32·7	279	e 7 46	PP	e 14 13	+147	e 16·1	—
Kodaikanal		37·6	202	6 26	−46	—	—	—	—

Additional readings :—
Bombay eN = +10m.26s.
Long waves were also recorded at Zinsen, Phu-Lien, Baku, Hamburg, Cheb, and Harvard.

Feb. 13d. 6h. 51m. 2s. Epicentre 36°·2N. 140°·9E. N.2.

A = −·626, B = +·509, C = +·591 ; D = +·631, E = +·776 ;
G = −·458, H = +·372, K = −·807.

		△	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Tyosi		0·5	183	i 0 5_a	− 2	0 12	− 1	0·2
Tokyo		1·1	241	0 15_a	− 1	0 29	+ 1	0·8
Mizusawa	E.	2·9	4	e 0 41	0	i 1 16	+ 2	—
Nagoya		3·4	253	i 0 51	+ 2	1 38	S*	2·1
Osaka		4·6	253	1 6	0	2 23	S_g	2·6
Kobe		4·9	254	1 8_a	− 2	2 24	S*	3·6
Toyooka		4·9	264	i 1 11	+ 1	i 2 36	S_g	2·7
Sumoto		5·2	251	e 1 14	0	2 41	S_g	2·6
Koti		6·5	249	e 1 33	+ 1	3 0	S*	3·6
Nagasaki		9·7	253	e 4 49	S*	—	—	—

Additional readings :—
Mizusawa iSN = +1m.20s. =S* −5s.
Osaka i = +1m.27s. $=P_g$ +1s. and +2m.12s. =S* −3s.
Toyooka iN = +2m.24s. =P* +4s., iSZ = +2m.41s. $=S_g$ +5s.

Feb. 13d. 22h. 9m. 8s. Epicentre 38°·7N. 117°·9W. (as on 3d.). X.

A = −·365, B = −·690, C = +·625.

		△	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Lick		3·2	245	e 0 47	+ 1	i 1 39	S_g	—
Branner		3·6	249	e 0 52	+ 1	i 1 51	S_g	—
Berkeley		3·6	257	e 0 50	− 1	e 1 43	S*	—
San Francisco	N.	3·7	255	e 0 58	P*	—	—	—
Ukiah		4·2	277	e 1 18	P_g	i 2 2	S*	2·5
Tucson		8·6	136	e 2 12	+10	i 4 27	S_g	—
Little Rock		20·7	93	e 4 39	+ 2	e 11 1	L	(11·0)

For Notes see next page.

NOTES TO FEB. 13d. 22h. 9m. 8s.

Additional readings :—
Lick iEN = +55s. =P* +3s.
Branner iEN = +1m.2s. =P_g −4s.
Berkeley e = +58s. =P* +0s., iEN = +1m.1s. =P_g −5s.
Tucson e = +2m.57s.

Feb. 13d. 23h. 6m. 15s. Epicentre 46°·3N. 153°·0E. (as on 1932 Oct. 12d.). X.

A = −·616, B = +·314, C = +·723 ; D = +·454, E = +·891 ;
G = −·644, H = +·328, K = −·691.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	11·3	235	e 2 47	+ 8	e 4 37	− 8	—	—
Kobe		17·8	236	e 4 2	− 2	e 7 19	− 1	—	12·1
Sumoto		18·2	235	—	—	e 7 26	− 3	e 10·1	12·5
Keizyo		21·1	255	4 41	0	8 36	+ 8	12·9	—
Zinsen		21·4	255	e 4 44	0	e 8 35	+ 1	e 11·7	—
Chiufeng		27·3	270	5 43$_B$	+ 2	i 10 31	+11	13·6	16·8
Nanking		29·8	254	e 6 13	+10	e 11 2	+ 1	17·3	21·4

Additional reading :—
Mizusawa ePN = +2m.53s.
Long waves were also recorded at Andijan, Hong Kong, Phu-Lien, and other Russian and European stations.

Feb. 13d. Readings also at 0h. (Hohenheim, Strasbourg, and Stuttgart), 1h. (near Andijan and near Malaga (2)), 4h. (La Paz, Ekaterinburg, Tashkent (2), near Almata, and Andijan), 6h. (Berkeley), 7h. (Melbourne, Riverview, Suva, Chiufeng, Almata, Andijan, Tashkent, Baku, and Ekaterinburg), 8h. (Hong Kong), 10h. (near Taihoku), 13h. (Koti, Sumoto, near Hukuoka, and Nagasaki), 16h. (near Tyosi), 17h. (near Mizusawa, Nagoya, and Tyosi), 18h. (Berkeley), 20h. (Branner), 22h. (Berkeley (2), Branner, Lick (2), and Tucson).

Feb. 14d. 4h. 24m. 5s. Epicentre 8°·0S. 135°·0E. (as on 1927 June 6d.). X.

A = −·700, B = +·700, C = −·139 ; D = +·707, E = +·707 ;
G = +·098, H = −·098, K = −·990.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina		8·0	302	i 1 50	− 3	i 3 1	−23	—	—
Manila		26·6	328	5 32	− 3	9 55	−14	—	—
Batavia		28·0	272	i 8 4	?	—	—	—	—
Perth		29·8	214	e 7 55	+112	e 13 5	+124	17·4	—
Sydney		30·2	153	—	—	e 10 55	−12	17·9	18·4
Mizusawa	E.	47·4	6	(e 8 37)	+ 5	e 8 37	P	—	—
Chiufeng		51·1	342	e 9 1	+ 1	—	—	—	—
Andijan		75·3	316	e 11 46	+ 4	—	—	—	—
La Paz	N.	146·5	138	20 12	[+35]	—	—	—	—

Additional readings :—
Manila iE = +5m.49s., iZ = +5m.53s.
Long waves were also recorded at Adelaide, Melbourne, Riverview, and Wellington.

Feb. 14d. 5h. 22m. 50s. Epicentre 24°·6S. 170°·3W. N.3.

A = −·896, B = −·153, C = −·416; D = −·168, E = +·986; G = +·410, H = +·070, K = −·909.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Suva		12·3	299	2 52	0	5 10	0	5·5	7·2
Arapuni		18·0	218	—	—	e 7 10?	−15	8·2	—
Wellington		20·9	213	—	—	i 8 25	+ 1	11·5	15·2
Sydney		34·7	245	e 5 40	−66	e 11 28	−49	17·5	18·5
Riverview		34·7	245	—	—	(e 14 10)	SS	e 17·1	18·9
Melbourne		40·0	240	—	—	e 17 22	(−20)	21·1	23·6
Adelaide		45·0	244	e 8 13	0	—	—	16·2	23·9
Perth		64·2	245	27 10	?	—	—	—	—
Pasadena	z.	76·8	42	e 11 51	+ 1	—	—	—	—
Riverside	z.	77·2	42	e 11 53	0	—	—	—	—
Tinemaha		78·6	40	e 12 1	+ 1	—	—	—	—
La Paz		93·8	110	e 18 10	?	—	—	50·7	54·7
Chiufeng		94·1	313	e 12 48	−28	—	—	—	—
Theodosia		150·9	321	e 19 34	[− 9]	—	—	—	—

Additional readings and note :—
Riverview gives S as an earlier L.
Melbourne i = +19m.35s.
Long waves were also recorded at Baku, Tashkent, American and European stations.

Feb. 14d. Readings also at 0h. (Granada, near Hukuoka, and Sikka), 2h. (Trenta and Wellington), 3h. (near Sumoto), 4h. (Trenta and Mizusawa), 5h. (Apia, La Paz, and near Santiago), 7h. (near Nanking), 9h. (La Paz), 11h. (Berkeley, Branner, and Lick), 13h. (Andijan and Bombay), 15h. (Almata, Andijan, Tashkent, Ekaterinburg, and Chiufeng), 16h. (Ravensburg, Karlsruhe, near Strasbourg, Stuttgart, and Zurich), 17h. (near Balboa Heights).

Feb. 15d. 8h. 59m. 8s. Epicentre 7°·0S. 124°·0E. (as on 1928 June 18d.). X.

A = −·555, B = +·823, C = −·122; D = +·829, E = +·559; G = +·068, H = −·101, K = −·993.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	5·3	51	1 19	+ 4	i 2 35	S*	—	—
Batavia	17·0	272	e 7 30	SS	12 9	?	—	—
Manila	21·8	352	4 43	− 6	8 42	0	11·2	13·1
Chiufeng	47·7	352	—	—	e 14 43	−46	—	—
Ekaterinburg	81·9	330	e 12 20	+ 2	e 22 39	+ 3	34·9	—

Long waves were also recorded at Adelaide, Melbourne, Riverview, Perth, Wellington, and Hong Kong.

Feb. 15d. Readings also at 2h. (Pasadena and Tinemaha), 3h. (near Apia), 5h. (Huancayo), 6h. (Harvard), 7h. (Bunnythorp), 8h. (Seatoun and near Wellington), 16h. (Edinburgh), 20h. (Huancayo, Yalta, near Mizusawa, and near Taihoku), 23h. (Berkeley).

Feb. 16d. 4h. 53m. 50s. Epicentre 1°·1N. 123°·9E. (as on 1932 November 18d.). X.

A = −·558, B = +·830, C = +·019; D = +·830, E = +·558; G = −·011, H = +·016, K = −1·000.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Amboina	6·4	138	1 31	0	2 24	−19	—
Manila	13·8	348	3 15	+ 2	5 54	+ 8	—
Nagoya	36·2	19	e 6 29	−31	—	—	—
Almata	59·3	322	e 10 58	+58	—	—	—
Andijan	61·1	317	e 10 12	0	—	—	—
Ekaterinburg	74·8	329	i 11 27	−12	20 55	−23	34·2

Long waves were also recorded at Hong Kong.

Feb. 16d. 9h. 8m. 12s. Epicentre 2°·0N. 126°·0E. (as on 1932 Aug. 2d.). R.3.

There is slight improvement in residuals if the epicentre be moved slightly to North and West.

$A = -\cdot587$, $B = +\cdot809$, $C = +\cdot035$; $D = +\cdot809$, $E = +\cdot588$; $G = -\cdot021$, $H = +\cdot028$, $K = -\cdot999$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina		6·1	159	1 31	+ 4	2 45	+ 9	—	—
Palau		10·0	57	2 22	+ 1	3 54	−19	—	—
Manila		13·5	339	3 12	+ 3	6 5	+26	7·5	—
Batavia		20·8	247	6 5	+87	8 50	+28	—	—
Hong Kong		23·3	331	5 5	+ 1	9 18	+ 8	—	14·1
Naha		24·3	4	5 13	0	—	—	—	—
Phu-Lien		26·6	316	4 48?	−47	—	—	—	—
Medan		27·3	274	e 5 36	− 5	7 51	?	—	—
Gihu		34·8	17	6 47	0	—	—	—	—
Perth		35·3	195	—	—	i 12 28	+ 2	—	—
Kohu		35·7	18	6 52	− 3	—	—	—	—
Oiwake		36·3	17	6 58	− 2	—	—	—	—
Chiufeng		39·1	349	7 24	0	e 13 0	−23	—	—
Sydney		43·0	150	e 17 30	SS	—	—	28·4	29·5
Melbourne		43·5	159	—	—	e 14 33	+ 5	24·3	—
Agra	E.	52·3	303	—	—	e 16 29	− 4	—	—
Bombay	N.	54·6	292	e 8 48	−38	—	—	—	—
Tashkent		64·2	317	e 11 2	(− 8)	i 19 8	− 2	e 28·6	36·1
Ekaterinburg		75·1	329	i 11 40	− 1	i 21 12	− 9	33·8	44·3
Tiflis		82·1	312	12 20	+ 1	i 22 38	0	45·8	55·4
Ksara		89·0	303	e 12 58	+ 5	23 49	+ 3	—	—
Pulkovo		91·1	330	e 13 7	+ 4	23 28	[+11]	46·8	52·2
De Bilt		106·7	325	—	—	e 23 48?	[−70]	e 58·8	—

Additional readings :—
Bombay eE = +9m.48s.
Tiflis eSS = +38m.0s.
Pulkovo iS = +23m.58s., PS = +25m.3s.
Long waves were also recorded at Riverview, Copenhagen, Paris, Strasbourg, and Stuttgart.

Feb. 16d. Readings also at 0h. and 1h. (near Mizusawa), 3h. (near Amboina), 7h. (La Paz, La Plata, and near Santiago), 10h. (near Santiago), 11h. (Tyosi), 12h. (near Amboina and near Tananarive), 15h. (Alicante and near Almeria), 16h. (Andijan), 18h. (Alicante, near Granada, and near Amboina), 20h. (Glenmuick (3) and near Santiago), 22h. (near Mizusawa and Tyosi), 23h. (near La Paz (2)).

Feb. 17d. Readings at 0h. (La Paz), 1h. (Vienna), 4h. (Almata, Andijan, and Perth), 12h. (Almata and near Andijan), 13h. (near Mizusawa), 16h. (near Taihoku), 18h. (near Mizusawa), 23h. (near Batavia, Malabar, and near Wellington).

Feb. 18d. 5h. 27m. 44s. (I) Epicentre 44°·5N. 16°·5E. X.
5h. 29m. 54s. (II) (as on 1925 April 3d.). X.

$A = +\cdot684$, $B = +\cdot203$, $C = +\cdot701$; $D = +\cdot284$, $E = -\cdot959$; $G = +\cdot672$, $H = +\cdot199$, $K = -\cdot713$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Zagreb	1·4	344	e 0 16?	− 4	e 1 32	?	e 2·1	—
I Triest	2·3	301	0 42	P_g	i 1 28	S_g	—	—
II	2·3	301	i 0 40	P_g	—	—	—	—
I Venice	3·1	288	e 0 46	+ 2	—	—	—	—
II	3·1	288	0 39	− 5	0 46	P*	—	2·0

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
II Padova	3·4	286	e 0 45	− 4	—	—	—	—
I Vienna	3·7	359	—	—	2 48	?	—	4·1
II	3·7	359	1 9	P_g	1 35	− 5	—	—
II Piacenza	4·9	279	—	—	e 2 6	+ 1	4·3	—
I Trenta	5·2	182	e 1 6	− 8	—	—	—	—
II Ravensburg	5·8	307	—	—	e 2 6	−22	—	—
II Stuttgart	6·6	312	—	—	e 2 48	0	—	—
II Strasbourg	7·3	307	e 2 6?	P*	—	—	—	—
II Uccle	10·3	312	—	—	e 4 6?	−15	—	—

Additional readings :—
Triest II iSS = +24s., SSS = +28s., iSSS = +35s.
Vienna II P_g = +51s. =P −2s.
Long waves were also recorded at Tiflis, Paris, and De Bilt.

Feb. 18d. 8h. 17m. 46s. Epicentre 35°·0N. 134°·4E. (given by Tokyo). N.1.

Probable error of epicentre ±0°·11.

A = −·573, B = +·586, C = +·574 ; D = +·715, E = +·700 ;
G = −·401, H = +·410, K = −·819.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Okayama		0·5	229	0 7	0	0 14	+ 1	—
Kobe		0·7	117	i 0 7k	− 3	i 0 17	− 1	0·3
Toyooka		0·7	32	i 0 7a	− 3	i 0 15	− 3	0·3
Sumoto		0·8	148	i 0 9a	− 2	i 0 18	− 3	0·3
Miyadu		0·9	50	0 10k	− 3	0 21	− 2	—
Tadotu		0·9	216	0 13k	0	0 24	+ 1	—
Tokusima		1·0	171	0 13a	− 1	0 28	+ 2	—
Wakayama		1·0	141	0 13a	− 1	0 26	0	—
Osaka		1·0	110	0 11	− 3	0 26	0	0·5
Kyoto		1·1	89	0 14k	− 2	0 27	− 1	—
Hikone		1·6	80	0 22k	− 1	0 42	+ 1	—
Koti		1·6	206	e 0 25	+ 2	e 0 41	0	0·8
Kameyama		1·8	95	0 27k	+ 1	0 47	+ 1	—
Matuyama		1·8	229	0 25a	− 1	0 48	+ 2	—
Hamada		1·9	267	0 23k	− 5	0 50	+ 1	—
Siomisaki		2·0	144	0 26	− 3	0 52	+ 1	—
Gihu		2·0	78	0 29	0	0 53	+ 2	—
Nagoya		2·2	85	0 33	+ 2	0 57	0	1·1
Simidu		2·5	208	0 42	+ 6	1 16	S*	—
Omaesaki		3·2	97	0 49a	+ 3	1 33	S*	—
Hukuoka		3·5	246	0 54	+ 4	1 50	S_g	1·9
	B.	3·5	246	1 0	P*	1 48	S_g	—
Nagano		3·5	61	0 59	P*	1 50	S_g	—
Kohu		3·5	78	0 51	+ 1	1 53	S_g	—
Hunatu		3·6	80	1 0	P*	1 48	S*	—
Numadu		3·7	89	1 10	P_g	1 43	S*	—
Kumamoto		3·7	236	1 2	P*	1 55	S_g	—
Misima		3·8	86	0 59	+ 5	1 52	S*	—
Maebasi		4·1	69	1 4	P*	2 2	S*	—
Kumagaya		4·2	73	1 2	+ 2	2 7	S*	—
Yokohama		4·3	83	1 16	P_g	2 12	S_g	—
Nagasaki		4·4	240	e 1 16	P*	e 2 13	S_g	—
Tokyo		4·4	80	1 20	P_g	—	—	—
Kakioka		4·9	74	1 12	+ 2	2 8	+ 3	—
Mito		5·2	72	1 32	P*	2 23	+10	—

Additional readings :—
Osaka i = +14s. =P_g +0s.
Koti iP_gZ = +29s., iS_gEN = +46s. =S* +0s.
Nagoya P_g = +35s.

Feb. 18d. 19h. 45m. 48s. Epicentre 16°·5N. 86°·0W. (as on 1925 Nov. 28d.). **R.3.**

A = +·067, B = −·956, C = +·284; D = −·998, E = −·070; G = +·020, H = −·283, K = −·959.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Columbia		18·0	14	e 4 0	− 7	e 7 30	+ 5	—	—
San Juan		19·0	81	e 4 15	− 4	—	—	e 8·2	—
Little Rock		19·1	344	e 4 15	− 5	e 7 57	+ 9	—	—
St. Louis	N.	22·4	351	e 4 52	− 3	i 9 4	+11	—	—
Florissant		22·6	351	i 4 55	− 2	e 9 8	+11	—	—
Cincinnati	Z.	22·7	4	i 5 4a	+ 6	i 9 20	+21	—	—
Georgetown		23·7	18	i 5 13	+ 6	i 9 29	+11	e 11·2	—
Pittsburgh		24·5	11	—	—	e 9 42	+10	—	—
Fordham		26·5	21	e 5 45	+11	e 10 13	+ 6	e 14·2	—
Madison		26·7	355	i 5 36	+ 1	e 10 12	+ 2	—	—
Tucson		27·5	310	e 5 43	0	e 10 38	+14	16·9	—
Toronto	N.	27·7	10	e 5 34	−10	i 10 28	+ 1	14·0	—
Huancayo		30·4	159	—	—	e 11 12	+ 2	—	—
East Machias		32·3	26	—	—	e 12 12?	+32	—	—

Additional readings :—
San Juan e = +4m.22s.
Florissant iSN = +9m.12s.
Cincinnati iZ = +5m.29s.
Tucson e = +10m.27s.
Long waves were also recorded at Balboa Heights.

Feb. 18d. Readings also at 3h. (near Mizusawa and Tyosi), 4h. (near Apia), 6h. (Nanking), 7h. (Andijan, Baku, Chiufeng, Ekaterinburg (2), Tashkent, Stuttgart, near Almata, and near Belgrade), 8h. (Perth), 9h. (Huancayo and La Paz), 12h. (Tinemaha), 14h. (Kobe), 15h. (near Tananarive), 17h. (Wellington, Andijan, Strasbourg, near Stuttgart, Zurich, and near Almata), 18h. (Karlsruhe, Ravensburg, Strasbourg, Suva (2), Almata, near Andijan, near Apia, near Stuttgart, and Zurich).

Feb. 19d. 4h. 26m. 10s. Epicentre 24°·5N. 122°·2E. (as on Jan. 5d.). **R.2.**

A = −·485, B = +·770, C = +·415; D = +·846, E = +·533; G = −·221, H = +·351, K = −·910.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		0·8	311	i 0 24	+13	i 0 41	+20	—	0·8
Zi-ka-wei	Z.	6·7	354	e 1 28	− 7	2 56	+ 5	—	—
Hong Kong		7·7	255	2 21	P_g	3 20	+ 4	—	4·5
Nanking		8·2	340	i 2 0	+ 4	3 30	+ 1	e 4·1	4·8
Manila		10·0	187	2 25	+ 4	4 20	+ 7	6·2	—
Nagasaki		10·6	37	e 2 26	− 3	—	—	—	—
Taikyu		12·6	24	2 57	+ 1	5 18	+ 1	—	—
Koti		13·4	45	e 3 8	+ 1	—	—	—	—
Zinsen		13·5	15	3 7a	− 2	e 5 41	+ 2	—	—
Keizyo		13·7	16	3 9	− 2	5 52	+ 8	—	—
Sumoto		14·8	45	3 28	+ 2	e 7 28	L	(e 7·5)	—
Heizyo		14·8	11	3 25	− 1	e 6 57	+47	8·1	—
Phu-Lien		14·9	259	e 3 31	+ 4	e 6 36	+23	16·8	—
Chiufeng		16·4	343	i 3 47a	+ 1	i 6 56	+ 8	i 9·3	—
Medan		30·8	232	i 6 20	+ 8	—	—	e 15·1	—
Irkutsk		30·9	340	e 6 0	−13	e 15 3	L	(e 15·1)	—
Batavia		34·2	210	6 38	− 4	—	—	—	—
Andijan		44·3	306	e 8 8	+ 1	—	—	—	—
Bombay		46·0	275	e 7 50	−31	e 14 50	−14	—	—
Tashkent		46·7	308	—	—	e 15 5	− 9	e 24·3	—
Baku		61·4	307	e 8 57	?	e 18 30	− 4	42·8	49·6
Tiflis	N.	64·9	309	—	—	e 19 12	− 7	38·8	—
Pulkovo		69·9	330	—	—	e 20 1	−19	54·8	56·9

For Notes see next page.

NOTES TO FEB. 19d. 4h. 26m. 10s.

Additional readings :—
Zi-ka-wei iZ = +3m.5s. =S* −12s., iE = +3m.48s., iN? = +3m.58s., +4m.6s., +4m.16s., iZ = +4m.46s. and +4m.54s.
Taikyu PP = +3m.2s., eN = +3m.56s. and +6m.24s. =S* +11s.
Zinsen iPPNZ = +3m.12s.
Keizyo PP = +3m.13s., e = +3m.38s., eN = +6m.32s.
Tashkent e = +15m.45s., i = +18m.4s. =SS −16s.
Tiflis eEN = +20m.17s. =S_eS −10s., eN = +28m.24s.
Pulkovo e = +31m.24s.
Long waves were recorded at other European stations.

Feb. 19d. 4h. 35m. 35s. Epicentre 14°·2N. 122°·7E. (given by Manila). N.3.

A = −·524, B = +·816, C = +·245 ; D = +·842, E = +·540 ;
G = −·133, H = +·206, K = −·969.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Manila	1·7	283	0 26	+ 2	0 51	S*	—
Kosyun	8·0	347	3 20	S	(3 20)	− 4	—
Hong Kong	11·5	316	−1 8	?	—	—	6·3
Miyazaki	19·5	23	4 25	+ 1	7 32	−24	—
Hukuoka	20·6	19	4 38	+ 2	8 30	+12	—
Koti	21·7	25	e 4 43	− 5	—	—	—
Oiwake	26·3	30	6 5	PP	—	—	—

Long waves were also recorded at Chiufeng, Zi-ka-wei, Nanking, Irkutsk, and Tashkent.

Feb. 19d. 8h. 34m. 40s. Epicentre 10°·4S. 162°·3E. N.3.

A = −·937, B = +·299, C = −·181 ; D = +·304, E = +·953 ;
G = +·172, H = −·055, K = −·984.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Suva	17·4	118	4 20?	+21	7 50	+39	8·9	10·3
Riverview	25·5	202	e 5 24	− 1	i 10 6	+16	e 12·3	15·3
Sydney	25·5	202	—	—	(10 2)	+12	13·7	14·6
Arapuni	30·1	159	—	—	11 8	+ 2	15·3	—
Melbourne	31·5	207	i 6 27	+ 9	i 11 25	− 3	15·8	17·9
Adelaide	32·7	218	e 6 20	− 9	i 11 47	+ 1	i 15·8	17·6
Wellington	32·8	164	6 27	− 3	11 35	−13	16·3	18·3
Honolulu T.H.	50·4	51	—	—	e 16 37	+31	e 22·8	—
Hong Kong	57·4	305	—	—	17 58	+16	—	33·8
Nanking	59·5	317	10 9	+ 8	18 31	+22	—	—
Chiufeng	66·1	323	i 10 51a	+ 5	i 19 45	+11	—	40·2
Irkutsk	79·9	328	e 12 8	+ 1	22 15	0	43·3	44·7
Berkeley	85·2	50	—	—	e 36 26	?	—	—
Mount Wilson	87·4	54	e 12 44	− 1	—	—	—	—
Pasadena	87·4	54	e 12 44	− 1	—	—	e 41·0	—
Victoria	87·7	40	23 29	S	(23 29)	− 5	41·9	47·6
Tinemaha	88·0	52	i 12 48	0	—	—	—	—
Tashkent	99·1	310	—	—	e 25 15	− 4	43·3	62·7
Ekaterinburg	105·1	326	e 18 30	[+29]	e 24 48	[− 2]	42·3	61·6
Florissant	110·3	52	—	—	e 28 26	PS	e 52·3	64·3
Baku	113·7	309	e 19 42	PP	e 29 29	PS	48·3	82·9
Tiflis	117·4	311	e 19 50	PP	e 29 58	PS	e 50·3	95·6
Pulkovo	119·2	334	e 20 24	PP	e 30 15	PS	60·3	68·7
La Paz	123·3	117	e 21 3	PP	30 45	PS	50·1	—
Copenhagen	129·0	339	—	—	39 20?	SS	67·3	—
Potsdam	131·2	335	e 21 20?	PP	—	—	—	79·3
De Bilt	134·4	340	e 21 56	PP	e 35 26	?	e 67·3	79·8
Stuttgart	135·6	334	e 21 56	PP	—	—	e 70·3	85·3
Uccle	135·7	340	e 22 2	PP	—	—	e 67·3	—
Strasbourg	136·3	335	(e 19 20?)	[+ 3]	—	—	e 19·3	—

For Notes see next page.

NOTES TO FEB. 19d. 8h. 34m. 40s.

Additional readings and note :—
Riverview i = +5m.37s.
Sydney e =8h.22m.42s. ; S is given as L.
Wellington PP = +7m.35s.
Chiufeng i = +10m.59s.
Irkutsk ePP = +15m.20s.?, eSS = +27m.1s.
Tashkent e = +25m.34s., +36m.38s., and +40m.38s.
Ekaterinburg i = +18m.38s. =PP +17s., e = +27m.40s. =PS +1s., and +33m.34s =SS +22s.
Tiflis eSSE = +36m.36s.
Stuttgart ePPSZ = +34m.50s.
Uccle e = +39m.20s. ? =SS −30s. and +44m.20s.? =SSS −20s.
Long waves were also recorded at Huancayo, Ivigtut, San Fernando, Paris, Cheb, and other American stations.

Feb. 19d. Readings also at 0h. (near Medan), 4h. (Pasadena, Tinemaha, Tucson, Little Rock, near Zinsen, and near Manila), 5h. and 6h. (2) (near Manila), 7h. (Riverview and Tucson), 8h. and 9h. (near Manila), 10h. (Hong Kong and near Manila), 12h. (near Nagoya), 13h. (Huancayo and Lick), 15h. (Neuchatel and Zurich), 18h. (near Manila), 19h. (Chicago), 20h. (near New Plymouth), 23h. (Zagreb, Trenta, near Triest, and near Balboa Heights).

Feb. 20d. 9h. 51m. 14s. Epicentre 37°·0N. 142°·3E. (given by Tokyo). N.1.

Probable error of epicentre ±0°·13.

A = −·632, B = +·488, C = +·602 ; D = +·612, E = +·791 ;
G = −·476, H = +·368, K = −·799.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Onahama		1·1	267	0 13$_k$	− 3	0 29	+ 1	—	—
Hukusima		1·6	297	0 21$_a$	− 2	0 45	+ 4	—	—
Mito		1·6	247	0 21	− 2	0 41	0	—	—
Tyosi		1·7	222	i 0 22	− 2	0 37	− 7	—	1·2
Sendai		1·7	318	0 24$_a$	0	0 46	+ 2	—	—
Kakioka		1·9	246	0 24$_a$	− 4	0 51	+ 2	—	—
Tukubasan		2·0	246	0 26$_k$	− 3	0 53	+ 2	—	—
Mizusawa		2·3	337	0 33	0	i 1 3	+ 4	—	—
Tokyo		2·5	237	0 35	− 1	—	—	—	—
Kumagaya		2·5	250	0 33$_a$	− 3	1 4	0	—	—
Maebasi		2·7	257	0 37	− 2	1 6	− 3	—	—
Yokohama		2·7	234	0 33	− 6	1 23	S$_g$	—	—
Mera		2·9	223	0 42	+ 1	1 47	S$_g$	—	—
Morioka		2·9	342	0 38	− 3	1 14	0	—	—
Akita		3·2	327	0 49$_a$	+ 3	1 27	+ 5	—	—
Kohu		3·3	246	0 46	− 1	1 34	+ 9	—	—
Nagano		3·3	264	0 48	+ 1	1 37	S*	—	—
Misima		3·3	235	0 49	+ 2	1 47	S$_g$	—	—
Hunatu		3·3	242	0 46	− 1	1 34	+ 9	—	—
Numadu		3·4	238	0 55	P*	1 23	− 4	—	—
Omaesaki		4·1	239	1 5	P*	2 3	S*	—	—
Wazima		4·3	277	1 1	0	2 2	S*	—	—
Hatidyozima		4·4	208	1 1	− 2	1 47	− 6	—	—
Gihu		4·7	252	1 11	+ 4	2 16	S*	—	—
Nagoya		4·7	249	e 1 8	+ 1	2 4	+ 4	—	2·9
Kameyama		5·2	247	1 21	+ 7	2 36	S*	—	—
Hikone		5·2	251	1 19	+ 5	2 21	+ 8	—	—
Osaka		6·0	249	1 30	+ 5	3 0	S*	—	3·9
Sapporo		6·1	354	1 39	P*	2 56	S*	—	—
Toyooka		6·2	259	i 1 31	+ 3	e 2 59	S*	—	3·3
Kobe		6·3	251	1 51$_a$	P*	e 3 8	S*	—	3·4
Wakayama		6·4	247	1 30$_a$	− 1	3 18	S$_g$	—	—
Siomisaki		6·4	238	1 51	P*	3 30	S$_g$	—	—
Sumoto		6·6	249	1 31	− 3	3 5	S*	—	3·6
Hukuoka	B.	10·3	254	2 26	+ 1	5 24	S$_g$	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Miyazaki		10·3	244	2 22	− 3	5 14	S*	—	—
Kumamoto		10·4	250	2 36	+10	5 34	S_g	—	—
Nagasaki		11·1	251	e 5 51	S_g	—	—	—	—
Nanking		20·0	263	e 4 33	+ 3	—	—	14·2	—
Chiufeng		20·6	287	e 4 50	PP	e 9 43	?	12·0	14·0
Ekaterinburg		55·4	319	e 9 27	− 5	e 17 13	− 2	25·8	35·6
Tiflis	E.	71·2	309	e 15 8	PPP	e 18 28	?	—	—

Additional readings :—
Tyosi S* = +46s.
Mizusawa iSE = +1m.6s.
Osaka i = +3m.15s. =S_g +3s.
Kobe eSZ = +3m.13s.
Sumoto ePZ = +1m.42s., SN = +3m.8s., eS?Z = +3m.35s. =S_g +3s.
Long waves were also recorded at Hong Kong, Irkutsk, Tashkent, Baku, Pulkovo, Copenhagen, De Bilt, and Stuttgart.

Feb. 20d. 11h. 1m. 13s. Epicentre 54°·1N. 164°·1E. (as on 1931 June 28d.). R.3

A = −·564, B = +·161, C = +·810 ; D = +·274, E = +·962 ; G = −·779, H = +·222, K = −·586.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		21·6	236	e 4 57	+11	e 5 34	?	—	—
Nagoya		26·7	236	e 5 36	+ 1	—	—	—	—
Osaka		27·8	237	5 32	−13	7 23	?	—	—
Sitka		33·2	59	e 6 40	+ 6	12 0	+ 6	e 17·5	—
Chiufeng		34·7	267	—	—	e 13 17	+60	e 20·0	25·8
Ekaterinburg		52·9	319	i 9 7	− 6	i 16 30	−11	28·9	29·4
Tinemaha		54·0	74	i 9 22	+ 1	—	—	—	—
Pasadena	Z.	56·2	77	e 9 37	0	—	—	—	—
Tashkent		60·2	301	—	—	i 18 13	− 6	e 28·1	35·7
Pulkovo		60·3	335	e 10 9	+ 2	e 18 3	−17	31·8	36·0
Copenhagen		67·8	343	—	—	20 5	+11	35·8	—
Baku		70·0	312	—	—	e 20 18	− 3	34·0	39·5
Tiflis	E.	71·0	316	—	—	e 18 50	−103	34·0	42·0
Hyderabad		73·4	275	20 56	S	(20 56)	− 5	—	43·9

Additional readings :—
Chiufeng eS = +17m.9s. =S_eS − 2s.
Tashkent e = +21m.41s. and +25m.5s.
Baku e = +26m.48s.
Long waves were also recorded at Hong Kong, Irkutsk, De Bilt, Uccle, Bombay, and Stuttgart.

Feb. 20d. 14h. 17m. 42s. Epicentre 37°·0N. 142°·3E. (as at 9h.). X.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Tyosi	1·7	222	e 0 23	− 1	0 40	− 4	1·0
Mizusawa	2·3	337	0 35	+ 2	i 1 6	S*	—
Nagoya	4·7	249	e 1 9	+ 2	2 5	+ 5	—
Osaka	6·0	249	1 24	− 1	2 57	S*	3·7
Sumoto	6·6	249	e 2 42	S	(e 2 42)	− 6	4·1

Additional readings :—
Tyosi PP = +32s. =P_g +4s.
Sumoto iN = +3m.11s., iE = +3m.16s. =S* +1s.

Feb. 20d. Readings also at 1h. (Kobe and near Sumoto), 2h. (Perth and near Santiago), 4h. (Chiufeng and Irkutsk), 5h. (Tashkent and near Sumoto), 8h. (near Manila (2)), 11h. (Osaka, Nagoya, near Tokyo, Tyosi, and near La Paz), 12h. (Pittsburgh), 15h. (Mizusawa and Tyosi), 16h. (Yalta), 17h. (Tucson, La Jolla, Pasadena, Riverside, Haiwee, and Tinemaha), 20h. (near Batavia and near Wellington), 21h. (near Tananarive), 22h. (New Plymouth, Wellington, near Andijan, and near Mizusawa), 23h. (Adelaide).

Feb. 21d. 2h. 53m. 20s. Epicentre 35°·2N. 141°·7E. N.3.

A = −·641, B = +·506, C = +·576; D = +·620, E = +·785; G = −·452, H = +·357, K = −·817.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		0·8	308	i 0 13*k*	+ 2	0 18	− 3	—	0·4
Nagoya		3·9	270	e 0 55	− 1	1 38	− 2	—	1·9
Mizusawa	E.	4·0	354	e 0 57	0	e 1 40	− 2	—	—
Osaka		5·1	265	1 12	− 1	(2 17)	+ 7	2·3	2·9
Kobe		5·4	266	e 1 39	P_g	e 2 23	+ 5	—	2·7
Sumoto		5·6	263	e 2 2	?	2 48	S*	—	2·9
Toyooka	N.	5·6	275	e 1 30	P*	i 2 38	S*	—	2·7

Additional readings :—
Mizusawa eSN = +1m.45s.
Kobe iZ = +2m.29s.
Toyooka ePE = +1m.41s. = P_g −5s.

Feb. 21d. 15h. 45m. 37s. (I) } Epicentre 48°·4N. 8°·9E. R.2.
15h. 48m. 52s. (II) } (as on 1931 Dec. 22d.) R.2.

A = +·656, B = +·103, C = +·748; D = +·155, E = −·988; G = +·739, H = +·116, K = −·664.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Stuttgart	0·4	28	0 6a	0	i 0 16	+ 6	—	—
II		0·4	28	i 0 7a	+ 1	i 0 16	+ 6	—	—
I	Hohenheim	0·4	42	i 0 5	− 1	—	—	—	—
II		0·4	42	i 0 5	− 1	—	—	—	—
I	Ravensburg	0·7	142	e 0 8	− 2	i 0 18	0	—	—
II		0·7	142	e 0 8	− 2	i 0 18	0	—	—
I	Karlsruhe	0·7	333	0 14	+ 4	0 24	+ 6	—	0·5
II		0·7	333	0 8	− 2	0 21	+ 3	—	0·4
I	Strasbourg	0·8	284	i 0 13	+ 2	i 0 25	+ 4	—	—
II		0·8	284	i 0 13	+ 2	i 0 26	+ 5	—	—
I	Zurich	1·1	192	i 0 13	− 3	e 0 25	− 3	—	—
II		1·1	192	i 0 13	− 3	i 0 26	− 2	—	—
I	Chur	1·6	164	i 0 23	0	e 0 41	0	—	—
II		1·6	164	i 0 24	+ 1	i 0 41	0	—	—
I	Neuchatel	2·0	223	i 0 27	− 2	e 0 51	0	—	—
II		2·0	223	e 0 28	− 1	i 0 55	+ 4	—	—
I	Cheb	2·8	53	e 0 47	P*	e 1 27	S_g	—	1·5
II		2·8	53	e 0 48	P*	e 1 26	S_g	—	1·8
I	Jena	3·1	34	0 49	P*	—	—	i 1·5	1·7
II		3·1	34	i 0 48	P*	—	—	1·6	1·8
I	Göttingen	3·2	12	e 0 57	P_g	e 1 26	+ 4	i 1·7	1·8
II		3·2	12	e 0 59	P_g	i 1 14	− 8	i 1·7	1·8
I	Uccle	3·8	312	—	—	e 1 56?	S*	—	—
II		3·8	312	—	—	e 1 57?	S*	—	—
I	Prague	4·0	63	—	—	e 1 51	+ 9	—	2·1
II		4·0	63	—	—	2 8	S_g	—	2·6
I	Paris	4·3	279	—	—	e 1 46	− 4	2·2	—
II		4·3	279	—	—	e 1 55	+ 5	—	—
I	Vienna	5·0	89	—	—	e 2 4	− 4	—	3·0
II		5·0	89	1 54	?	2 40	S_g	—	2·8
I	Hamburg	5·2	7	—	—	e 2 53	S_g	—	—
II		5·2	7	—	—	e 2 50	S_g	—	—

Additional readings :—
Stuttgart I i = +11s., II i = +11s., i_q = +13s.
Ravensburg I i_q = +16s., II i_q = +16s.
Strasbourg I PS = +28s., SS = +35s., SSS = +59s., II PS = +28s., SS = +53s.
Feldberg (Δ = 1°·9 Az. = 351°) I i = −8s., iN = −3s., iN = +3s. and +8s., M = +10s., II iN = −4s. and +3s., i = +7s.
Neuchatel I eP_g = +30s.
Jena I iE = +53s. = P* +3s., +1m.1s., and +1m.7s., eE = +1m.8s., II i = +50s. = P* +0s., iEN = +56s., iE = +59s., +1m.14s., and +1m.21s.
Göttingen I iEN = +56s. and +58s. = P_g +0s., iEN = +1m.0s., i = +1m.5s., iEN = +1m.8s. and +1m.13s., II iE = +1m.3s., +1m.7s., and +1m.10s.
Vienna I iE = +2m.14s., i = +2m.29s., and +2m.37s. = S* +4s., iE = +2m.44s. and +2m.48s. = S_g +2s., iN = +2m.52s., II P* = +2m.3s., P_g = +2m.18s., i = +2m.31s., iN = +2m.37s. = S* +4s.

Feb. 21d. 19h. 3m. 5s. Epicentre 27°·5N. 57°·5E. N.2.

A = +·477, B = +·748, C = +·462 ; D = +·843, E = −·537 ;
G = +·248, H = +·389, K = −·887.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Baku		14·3	336	e 3 16	− 3	i 5 57	− 1	8·9	13·2
Bombay		16·5	118	3 49	+ 1	7 12	+22	—	14·7
Tiflis		17·6	327	4 1	− 1	7 20	+ 5	9·7	10·7
Andijan		18·0	39	e 4 10	+ 3	—	—	—	—
Agra		18·2	86	4 16	+ 7	7 52	+23	9·8	—
Ksara		19·6	294	e 4 23	− 2	i 7 57	− 1	—	10·9
Hyderabad		21·8	113	5 13	+24	9 3	+21	10·9	14·2
Helwan		23·0	282	5 3	+ 2	i 9 15	+10	—	16·0
Theodosia		24·8	321	e 5 18	0	e 9 38	+ 1	e 13·0	—
Yalta		25·2	318	5 24	+ 2	9 45	+ 1	—	—
Simferopol		25·5	319	5 27	+ 2	e 9 50	0	—	—
Kodaikanal		25·5	129	5 17	− 8	10 8	+18	14·7	—
Calcutta		28·4	93	e 7 22	+91	12 3	+85	15·5	—
Ekaterinburg		29·4	4	e 5 59	− 1	e 10 56	+ 1	16·8	23·0
Pulkovo		37·2	338	e 7 9	+ 1	e 12 53	− 1	18·9	24·7
Vienna	Z.	37·8	314	e 7 16	+ 3	—	—	—	—
Cheb		40·9	316	—	—	e 13 55?	+ 5	—	—
Irkutsk		42·6	41	e 7 52	− 1	e 14 17	+ 2	22·9	27·9
Copenhagen		42·7	324	—	—	14 55?	+39	20·9	—
Neuchatel	N.	43·7	311	e 7 56	− 6	—	—	—	—

Additional readings and notes :—
Tiflis eN = +4m.29s., SSE = +7m.40s., eN = +8m.37s.
Neuchatel e = +8m.1s.
Long waves were also recorded at Chiufeng, Hong Kong, Cape Town, and other European stations.

Feb. 21d. Readings also at 3h. (Melbourne and Wellington), 6h. (Stonyhurst (2)), 10h. (Cape Town), 11h. (Berkeley, Branner, Lick, Takaka, and Wellington), 12h. (Hohenheim, Ravensburg, Stuttgart, near Zurich, near Seatoun, Christchurch, and Glenmuick), 14h. (Cape Town), 16h. (Hohenheim, near Stuttgart, Zurich, and near Balboa Heights), 18h. (Keizyo, Takaka, and near Wellington), 19h. (near Batavia), 23h. (Ravensburg, Zurich, near Hohenheim, and Stuttgart).

Feb. 22d. 3h. 48m. 6s. Epicentre 5°·4N. 125°·2E. (as on 1929 Jan. 19d.) R.3.

A = −·574, B = +·813, C = +·094 ; D = +·817, E = +·576 ;
G = −·054, H = +·077, K = −·996.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		10·1	336	(2 34)	+12	2 34	P	—	—
Hong Kong		20·0	329	4 29	− 1	7 58	− 8	—	12·4
Batavia		21·7	238	4 48a	0	i 8 49	+ 9	—	—
Phu-Lien		23·7	312	e 5 2	− 5	9 8	−10	—	—
Zi-ka-wei	E.	26·0	353	5 30	+ 1	10 14	+16	—	18·6
Medan		26·5	265	i 5 39	+ 5	i 10 54	SS	—	—
Chiufeng		35·6	348	6 51	− 3	—	—	e 19·2	24·9
Irkutsk		50·0	344	—	—	e 15 49	−12	e 23·9	41·8
Baku		75·4	311	e 11 44	+ 1	21 14	− 9	37·4	47·5
Tiflis	E.	79·2	312	e 12 4	0	e 21 56	−11	46·9	54·1
Pulkovo		87·8	330	—	—	e 23 16	[− 3]	47·9	—

Additional readings :—
Manila eP =3h.48m.26s.
Pulkovo e = +29m.8s. =SS +0s.
Long waves were also recorded at Tashkent, Copenhagen, Edinburgh, De Bilt and Uccle.

Feb. 22d. 17h. 57m. 4s. Epicentre 43°·0N. 81°·0E. N.3.

A = +·114, B = +·722, C = +·682; D = +·988, E = −·156;
G = +·107, H = +·674, K = −·731.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Andijan	6·8	253	e 1 31	− 6	e 2 59	+ 6	—	—
Irkutsk	18·1	51	i 4 23	+15	7 59	+32	11·0	—
Ekaterinburg	18·9	324	i 4 17	0	i 7 46	+ 2	i 11·1	—
Calcutta	21·4	161	4 2	−42	7 57	−37	10·1	—
Baku	23·3	275	5 2	− 2	9 11	+ 1	12·2	15·5
Bombay	25·1	199	5 26	+ 5	9 38	− 5	12·4	15·4
Hyderabad	25·7	186	5 23	− 3	9 17	−36	13·4	15·6
Tiflis	26·6	280	e 5 36	+ 1	e 10 14	+ 5	15·4	23·6
Kucino	30·2	310	e 6 8	+ 1	—	—	8·9	9·8
Kodaikanal	32·9	187	6 33	+ 2	11 41	− 8	15·1	18·0
Hong Kong	34·4	117	12 29	S	(12 29)	+17	—	23·7
Pulkovo	34·7	317	i 6 46	0	e 12 16	− 1	15·4	18·2
Helsingfors	37·4	318	i 9 43	(+10)	i 16 58	(−28)	e 23·6	—
Budapest	42·7	298	e 9 56?	PP	—	—	e 23·9	—
Vienna	44·1	300	8 4	− 2	—	—	i 24·7	—
Copenhagen	44·4	312	8 9	+ 1	14 48	+ 7	20·9	—
Potsdam	45·0	307	e 7 56?	−17	e 16 56?	SS	i 21·0	24·4
Jena	46·2	305	e 8 20	− 2	—	—	e 24·6	25·3
Triest	46·7	297	—	—	(e 15 56?)	+42	e 15·9	24·9
Göttingen	47·0	307	i 8 29	0	—	—	—	25·9
Stuttgart	48·5	304	—	—	e 22 26	?	e 27·9	29·8
Chur	49·0	302	e 8 43	− 1	—	—	e 25·4	—
Zurich	49·4	302	e 8 47	0	—	—	—	—
Neuchatel	50·5	302	e 8 54	− 1	—	—	—	—
Uccle	50·6	308	e 8 56?	0	—	—	e 24·9	—

Additional readings :—
Tiflis iE = +5m.42s., eE = +10m.28s.
Kucino e = +8m.26s.
Helsingfors ePPPN = +12m.57s., eE = +13m.46s., eP_cSN = +15m.15s., =SS −6s. iS_cSN = +19m.29s., iE = +19m.57s., eZ = +20m.1s., iSSE = +20m.29s., iSSN = +20m.37s.; T_o =17h.57m.32s.
Jena eE = +8m.33s.
Stuttgart e = +24m.35s.
Long waves were also recorded at Nanking, Phu-Lien, and other European stations.

Feb. 22d. Readings also at 1h. (near Batavia), 2h. (near Batavia and near Tiflis), 4h. (Andijan), 6h. (near Amboina and Malabar), 7h. (Berkeley), 9h. (Lick), 12h. (Lick, Huancayo, La Paz (2), and Sucre), 19h. (Andijan (2), Baku, Ekaterinburg, Irkutsk (2), and Hong Kong), 20h. (Pulkovo and Tiflis), 21h (Tananarive).

Feb. 23d. 8h. 9m. 19s. Epicentre 20°·0S. 70°·2W. N.1.

Probable error of epicentre ±0°·24.

A = +·318, B = −·884, C = −·342; D = −·941, E = −·339;
G = −·116, H = +·322, K = −·940.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma	2·9	154	i 0 39	− 2	i 1 12	− 2	—	—
La Paz	4·0	29	i 1 9a	P*	i 2 5	S_E	—	2·8
Sucre	4·8	79	i 0 16	−52	—	—	—	—
Huancayo	9·3	327	i 2 20	+ 9	i 4 9	+13	i 4·9	—
Santiago	13·4	182	2 11	−56	4 49	−48	6·1	6·4
La Plata	18·4	147	4 3	− 8	7 29	− 4	9·4	—
Balboa Heights	30·4	343	i 6 22	+13	i 11 17	+ 7	e 14·1	—
Port au Prince	38·6	358	i 7 29	+ 9	i 13 19	+ 4	e 18·6	—
San Juan	38·6	8	i 7 19	− 1	i 13 5	−10	15·9	—
Columbia	55·0	350	i 9 29	0	i 17 10	+ 1	e 23·0	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Charlottesville		58·6	353	i 9 54	− 1	i 17 57	0	e 23·7	—
Little Rock		58·7	338	e 9 54	− 1	i 17 52	− 7	—	28·2
Georgetown		59·3	355	i 9 59	− 1	18 3	− 4	e 27·7	—
Woodstock		59·7	356	i 10 4	+ 2	i 18 14	+ 2	27·3	—
Cincinnati	Z.	60·6	348	i 10 8k	− 1	i 18 15	− 9	—	—
Fordham		61·0	358	e 10 11	0	i 18 21	− 8	i 27·7	—
Pittsburgh		61·2	353	i 10 9	− 4	i 18 30	− 2	29·6	—
St. Louis		61·6	343	e 10 13	− 3	i 18 29	− 8	—	31·8
Florissant		61·8	343	i 10 14	− 3	i 18 33	− 6	e 28·7	34·7
Harvard		62·3	359	i 10 25	+ 5	i 18 45	− 1	e 25·5	—
Dakar	N.	62·4	61	10 21	0	18 45	− 2	—	—
Buffalo		63·4	354	i 10 27	− 1	i 19 11	+11	—	29·7
Ann Arbor		63·6	350	i 10 29	0	i 18 59	− 3	e 28·8	35·9
Chicago		64·0	345	i 10 28	− 4	i 18 58	− 9	26·3	—
Toronto		64·2	353	i 10 35	+ 1	i 19 5	− 5	30·7	—
East Machias		64·8	3	i 10 36	− 1	i 19 15	− 2	e 26·3	—
Halifax		64·9	7	10 38	0	19 15	− 4	28·7	—
Tucson		65·2	323	i 10 44	+ 4	i 19 22	0	27·1	—
Madison		65·5	345	i 10 30	−12	i 19 8	−18	29·7	—
Ottawa		65·6	357	i 10 41	− 1	i 19 24	− 3	e 29·7	—
Denver		67·9	332	e 11 0	+ 2	e 19 51	− 5	—	34·7
La Jolla		69·4	319	i 11 0	− 7	i 20 14	0	—	—
Riverside		70·2	320	i 11 10	− 2	i 20 25	+ 1	—	—
Pasadena		70·8	320	i 11 15	− 1	i 20 32	+ 1	—	—
Santa Barbara		72·0	319	e 11 25	+ 2	i 20 44	− 1	—	—
Tinemaha		72·8	321	i 11 27	− 1	i 20 56	+ 2	—	—
Lick		75·0	320	e 11 39	− 1	—	—	—	—
Branner		75·2	320	e 11 41	0	i 21 23	+ 1	—	—
Bozeman		75·4	332	i 11 46	+ 3	i 21 23	− 2	—	—
Berkeley		75·7	320	i 11 44a	0	i 21 27	− 1	—	—
Ukiah		77·1	321	e 11 55	+ 2	i 21 43	− 1	32·7	—
Cape Town		77·9	122	11 56	− 1	21 41	−12	37·9	42·4
Spokane		79·8	330	12 9	+ 2	22 7	− 7	—	—
Seattle		82·2	328	e 12 17	− 2	22 40	+ 1	e 32·7	—
San Fernando		82·6	47	11 48	−33	22 42	− 1	37·7	52·7
Ivigtut		83·1	11	12 22	− 2	i 22 39	− 9	38·7	—
Coimbra		83·2	43	i 12 23	− 1	22 42	− 7	—	—
Victoria		83·2	328	12 25	+ 1	22 46	− 3	40·2	50·7
Serra do Pilar		83·6	42	12 24	− 2	—	—	—	—
Malaga		84·0	47	i 12 30	+ 2	i 22 58	0	36·9	44·3
Granada		84·8	47	i 12 34	+ 2	i 23 4	− 2	40·8	58·1
Almeria		85·5	48	i 12 34	− 2	i 23 20	+ 7	e 35·2	50·8
Toledo		85·9	45	i 12 37	− 1	i 23 31	+14	e 35·8	44·8
Madrid		86·4	45	i 12 38	− 2	i 23 33	+12	—	—
Alicante		87·5	47	e 12 40	− 5	i 23 28	− 4	e 36·1	51·6
Johannesburg		88·3	118	—	—	23 29	[+ 7]	—	—
Algiers		89·3	51	i 12 48	− 6	23 59	+10	44·7	52·2
Tortosa	E.	89·4	46	—	—	23 44	− 6	e 37·7	47·8
	N.	89·4	46	—	—	23 51	+ 1	e 34·7	46·6
Bagnères		90·2	43	i 12 57	− 1	23 56	− 2	—	—
Barcelona		90·7	45	—	—	i 23 53	−10	e 29·8	48·2
Puy de Dôme		93·2	42	e 13 15	+ 3	e 23 32?	[−19]	e 39·7	—
Liverpool		93·2	33	i 13 11	− 1	i 24 1	{ 0}	39·7	50·2
Bidston		93·3	33	i 13 11	− 2	i 24 6	{+ 5}	39·8	50·0
Oxford		93·4	35	i 13 12a	− 1	i 24 11	{+ 9}	e 37·7	50·2
Marseilles		93·7	45	i 17 16	PP	24 3	{− 2}	50·7	—
Stonyhurst		93·8	33	i 13 16	+ 1	i 24 11	{+ 6}	42·7	50·7
Kew		93·8	35	i 13 12a	− 3	e 23 49	[− 5]	44·7	49·9
Wellington		94·2	223	14 23	+66	23 48	[− 8]	43·7	43·7
Sitka		94·2	330	—	—	23 48	[− 8]	e 38·1	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Paris		94·2	39	i 13 14$_a$	− 3	24 16	{+ 7}	41·7	42·7
Christchurch		94·3	220	10 41?	?	—	—	—	—
Glenmuick		94·3	221	—	—	(20 41?)	?	20·7	—
Tunis		94·5	52	i 13 26	+ 8	—	—	—	—
Edinburgh		94·5	31	i 13 19	+ 1	i 24 14	{+ 3}	39·7	51·9
Durham		94·7	33	12 58	−21	24 20	{+ 7}	—	51·7
Honolulu T.H.		95·0	291	—	—	i 23 59	[− 2]	e 40·3	—
Arapuni		95·3	226	—	—	24 23	[+21]	45·3	47·7
Uccle		96·1	37	i 13 23$_a$	− 3	23 54	[−12]	40·7	44·6
Neuchatel		96·2	42	e 13 24	− 2	e 23 57	[−10]	—	—
De Bilt		97·2	36	13 29$_a$	− 2	—	—	e 44·7	45·7
Strasbourg		97·3	40	i 13 28$_a$	− 3	23 43	{+11}	e 45·7	53·7
Piacenza		97·3	44	13 33	+ 2	i 24 11	[− 2]	—	55·7
Zurich		97·4	42	e 13 30	− 2	e 24 7	[− 6]	—	—
Pavia		97·5	43	e 13 38	+ 6	—	—	—	—
Florence		97·8	46	i 13 32	− 1	24 24	[+ 9]	45·7	47·7
Chur		97·8	42	e 13 33	0	e 24 9	[− 6]	—	—
Prato		97·8	46	e 13 32	− 1	i 24 21	[+ 6]	e 40·7	54·7
Karlsruhe		97·9	40	13 41?	+ 7	—	—	38·7	—
Rome		98·0	47	e 13 23	−11	i 17 34	PP	—	—
Stuttgart		98·2	41	i 13 34$_a$	− 1	e 25 41	+30	e 44·7	55·4
Feldberg	E.	98·3	39	e 13 32	− 4	e 24 9	[− 8]	—	53·7
Catania		98·5	53	13 25	−12	24 11	[− 7]	48·4	59·5
Padova		98·8	45	13 42	+ 4	24 45	{+ 1}	—	—
Messina		99·0	52	e 13 38	− 1	24 42	{− 4}	—	—
Naples	E.	99·0	49	e 17 35	PP	e 24 41	{− 5}	52·7	60·7
Venice		99·1	45	13 42	+ 3	24 41	{− 6}	50·7	55·7
Treviso		99·1	45	i 13 41	+ 2	24 43	{− 4}	46·0	53·7
Göttingen		99·7	38	i 13 41	− 1	e 24 47	{− 4}	e 38·7	45·7
Triest		100·1	45	i 13 41$_a$	− 3	24 19	[− 7]	e 42·4	51·2
Hamburg		100·4	36	13 48	+ 3	i 24 19	[− 9]	e 43·7	55·7
Bergen		100·5	28	14 29	+43	25 24	− 7	47·7	55·7
Jena		100·5	40	e 13 41	− 5	e 24 15	[−13]	e 45·7	54·7
Cheb		100·7	40	e 13 57	+10	e 24 28	[− 1]	e 46·7	54·7
Laibach		100·7	44	e 13 48	+ 1	e 24 52	{− 6}	e 45·2	56·2
Taranto		101·0	51	13 41	− 7	21 41	PPPP	—	—
Zagreb		101·6	45	e 13 50	− 1	e 24 28	[− 5]	e 43·7	56·7
Potsdam		101·7	38	e 13 50	− 1	24 55	[+21]	e 44·7	55·7
Prague		101·9	40	e 13 54	+ 2	e 24 40	[+ 5]	41·7	55·2
Copenhagen		102·4	34	13 52	− 3	24 34	[− 3]	44·7	—
Suva		102·6	245	14 23	+28	24 41	[+ 3]	48·2	50·7
Vienna		102·6	43	i 13 55	0	24 37	[− 1]	e 36·7	55·7
Budapest		104·1	44	e 13 41?	−21	e 24 28	[−17]	e 41·7	53·7
Belgrade		104·4	47	e 14 4	0	e 24 35	[−12]	e 48·8	59·8
Athens		105·1	55	14 15$_k$	+ 8	24 50	[0]	50·7	63·2
Upsala		106·1	31	e 14 10	− 2	i 25 9	[+14]	e 45·2	57·3
Tananarive		107·6	118	18 39	PP	25 24	[+22]	e 50·8	56·7
Lemberg	E.	107·8	42	e 18 4	[− 6]	—	—	—	—
Helwan		109·5	65	14 26	− 3	25 3	[− 8]	54·8	66·6
Helsingfors		109·8	31	e 18 52	PP	e 24 46	[−26]	e 44·9	—
Pulkovo		112·4	32	e 14 34	− 8	25 7	[−17]	52·7	56·4
Riverview		113·3	216	—	—	i 25 20	[− 7]	e 47·8	52·9
Sydney		113·3	216	i 25 5	S	(i 25 5)	[−22]	53·9	59·0
Melbourne		113·4	210	e 20 4	?	i 25 15	[−13]	51·7	57·7
Sebastopol		113·5	49	19 21	PP	—	—	50·7	—
Yalta		114·0	49	e 18 42	[+12]	—	—	52·7	—
Simferopol		114·0	48	e 18 40	[0]	—	—	e 45·7	—
Ksara		114·0	62	i 19 31	PP	29 16	PS	55·0	63·4
Theodosia		114·8	48	e 18 40	[+ 8]	—	—	47·7	—
Kucino		116·6	37	18 41	[+ 4]	28 29	?	—	64·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Adelaide		118·6	206	i 20 18	PP	i 25 33	[−13]	50·0	57·5
Tiflis	E.	121·6	52	e 15 21	− 2	25 51	[− 4]	e 49·2	68·0
Baku		125·5	54	15 42	− 5	31 2	PS	—	76·7
Ekaterinburg		128·5	31	i 15 50	−11	i 31 9	PS	67·7	69·3
Andijan		142·0	48	e 19 30	[+ 6]	—	—	42·7	—
Almata		143·9	41	e 19 37	[+ 6]	—	—	50·7	—
Bombay		145·2	86	19 39	[+ 5]	30 11	{+17}	—	80·7
Morioka		146·7	313	19 42	[+ 5]	—	—	—	—
Mizusawa	E.	147·0	312	e 19 40	[+ 3]	—	—	—	—
Irkutsk		147·4	6	19 39	[+ 1]	33 9	SKSP	—	—
Kodaikanal		147·4	101	i 19 39	[+ 1]	36 4	?	62·5	78·2
Colombo		148·1	110	e 19 41	[+ 2]	—	—	62·9	81·6
Tyosi		148·5	306	e 19 51	[+11]	—	—	68·9	71·0
Tokyo		149·4	307	19 52	[+11]	—	—	—	—
Yokohama		149·6	307	19 49	[+ 8]	—	—	—	—
Titizima		149·6	290	19 45	[+ 4]	—	—	—	—
Agra	E.	150·1	70	19 42	[0]	—	—	—	—
Amboina		150·2	219	i 19 41	[− 1]	—	—	e 55·9	—
Hyderabad		150·3	90	19 45	[+ 3]	33 36	SKSP	61·6	82·5
Nagoya		151·7	308	19 57	[+13]	(23 24)	PP	23·4	—
Osaka		152·9	308	19 51	[+ 5]	34 1	SKSP	70·9	92·8
Palau		152·9	246	19 46	[0]	—	—	—	—
Toyooka		153·1	311	i 19 52	[+ 6]	—	—	e 72·5	75·6
Kobe		153·3	309	e 19 53k	[+ 7]	i 30 32	{− 9}	e 74·7	82·5
Siomisaki		153·3	306	19 43	[− 3]	—	—	—	—
Batavia		153·6	173	e 19 49	[+ 2]	—	—	e 70·7	75·7
Sumoto		153·6	308	19 58	[+11]	38 59	?	e 43·2	75·7
Koti		154·9	308	e 19 52	[+ 4]	e 43 42	SS	e 74·0	—
Heizyo	E.	156·5	328	e 19 35	[−15]	e 42 17	?	—	—
Keizyo		156·9	323	19 57	[+ 7]	30 46	{−15}	44·1	85·7
Hukuoka		157·2	311	e 17 3	?	e 30 16	{−47}	—	79·0
	B.	157·2	311	19 41	[− 9]	29 59	PPPP	—	—
Miyazaki		157·2	306	19 45	[− 5]	—	—	—	—
Zinsen		157·2	324	e 19 54	[+ 4]	e 31 8	{+ 5}	e 64·7	67·0
Nagasaki		158·0	310	19 58	[+ 7]	—	—	e 74·2	—
Chiufeng		159·2	346	i 19 52a	[0]	—	—	e 69·7	97·6
Calcutta		159·9	79	19 32	[−22]	33 32	?	77·8	85·1
Nake		160·2	299	20 3	[+ 9]	—	—	—	—
Medan		160·4	145	20 11	[+17]	i 24 42	PP	e 70·7	86·0
Naha		162·4	294	20 15	[+ 9]	—	—	—	—
Zi-ka-wei	Z.	164·7	319	i 20 1k	[+ 2]	i 24 47	PP	77·6	80·6
Nanking		165·5	328	i 20 3a	[+ 3]	31 59	{+11}	56·9	81·0
Isigakizima		166·0	291	20 6	[+ 6]	31 37	{−14}	—	—
Manila		168·0	245	e 20 1	[− 1]	—	—	—	—
Taihoku		168·0	297	20 16	[+14]	—	—	—	—
Hong Kong		176·3	301	20 12	[+ 5]	32 22	{−22}	—	87·3
Phu-Lien		177·0	74	e 20 10	[+ 3]	40 41	?	—	—

Additional readings :—
Montezuma iP* = +42s.
Huancayo i = +4m.1s. and +4m.25s.
Port au Prince i = +8m.19s., PP = +8m.36s., PPP = +9m.9s., i = +13m.39s., SS = +16m.9s. =SSS −2s.
San Juan ePP = +9m.6s. =PPP +6s., iS = +13m.11s.
Charlottesville eSS = +21m.49s.
Woodstock iS_cS = +19m.50s.
Little Rock iEN = +9m.59s. and +10m.14s., eN = +12m.9s. =PP +11s., iE = +18m.18s. =PS +14s., and +18m.33s., eN = +21m.51s. =SS +3s.
Cincinnati iZ = +10m.23s., +11m.36s., and +12m.25s. =PP +10s.
St. Louis iP = +10m.18s., ipP = +10m.31s., iP_cP = +11m.11s., iPP = +12m.28s., ipPP = +12m.47s., iS = +18m.34s., i = +18m.52s. and +19m.15s.
Florissant iP = +10m.18s., iEZ = +10m.58s. =P_cP −2s., i = +11m.11s., iEN = +12m.36s. =PP +10s., iE = +18m.55s.
Harvard e = +11m.51s., ePP = +13m.53s., iPS = +19m.40s., eSS = +22m.51s.
Dakar PS = +19m.9s.

Continued on next page.

Buffalo i = +19m.23s. =PS +14s.
Ann Arbor ePP = +12m.41s., iE = +20m.17s. =S_cS −1s., eSS = +23m.41s.
Chicago i = +10m.35s., e = +12m.56s. =PP +11s., i = +14m.26s. =PPP +15s., +20m.24s. =S_cS +3s., e = +23m.6s.
Toronto iN = +23m.24s. =SS +10s., iSSE = +23m.35s., iSSSE = +26m.25s.
East Machias iPP = +12m.55s., e = +23m.16s. =SS −7s.
Tucson i = +22m.33s., eSS = +24m.15s.
Madison ePP = +13m.0s., eSS = +23m.28s., eSSS = +26m.30s. ; T_0 =8h.9m.38s.
Ottawa ePPPN = +15m.20s., eSSN = +24m.11s., eSSSE = +27m.35s.
Denver iE = +20m.58s. =S_cS +8s.
Pasadena iPPN = +14m.20s.
Bozeman e = +26m.13s. =SS +9s. and +29m.41s.
Berkeley eE = +21m.30s.
Ukiah iSS = +26m.51s.
Cape Town +12m.22s., +12m.35s., +12m.52s., PP = +14m.42s., +15m.11s., PPP = +16m.17s., +16m.56s., +20m.3s., PS? = +22m.10s., PPS? = +22m.26s., SS = +26m.32s., SSS = +29m.20s., +30m.44s., +32m.56s., +35m.42s., and +37m.21s.
San Fernando P = +12m.22s. and +12m.25s.
Ivigtut iZ = +12m.37s., eN = +22m.47s., PSN = +23m.39s.
Malaga PP = +15m.43s., PS = +24m.5s., SS = +27m.34s.
Granada P_cP = +13m.10s., SS = +31m.9s.
Almeria PP = +15m.52s., PS = +24m.21s.
Toledo i = +12m.41s. and +12m.58s., SPS = +23m.8s., PS = +24m.26s., SS = +29m.31s., SSS = +32m.26s.
Alicante iP = +12m.48s., PP = +16m.32s.
Algiers iPP = +16m.45s., SKS = +23m.23s., PS = +24m.41s.
Bagnères PP = +16m.27s., PS = +25m.12s.
Puy de Dome ePP = +16m.57s., ePPP = +18m.59s., i = +24m.17s.
Liverpool PP = +16m.56s. ; T_0 =8h.9m.37s.
Bidston iPP = +16m.51s., PKP = +17m.11s. ; T_0 =8h.9m.30s.
Oxford i = +16m.50s. =PP −2s., e = +23m.42s. =SKS −10s.
Marseilles PPS = +26m.19s.
Stonyhurst iPP = +16m.58s., i = +26m.1s., SS = +30m.56s.
Kew iPP = +16m.53s., i = +17m.17s., iSKKSEN = +24m.9s., iN = +24m.47s. = S +16s., iPSEN = +25m.59s., iPPSEN = +26m.29s., iSSEN = +30m.48s., L_eEN = +38·7m.?
Wellington S = +24m.29s., SS = +30m.59s., SSSS = +36m.41s.?, i = +38m.26s.
Sitka PS = +25m.44s., SS = +30m.55s.
Paris SKS = +23m.48s.
Tunis i = +17m.26s.
Edinburgh i = +17m.6s. =PP +5s., +17m.27s., +26m.37s., +31m.9s., and +31m.33s.
Durham ? = +24m.51s. =S +12s.
Honolulu T.H. PS = +26m.1s.
Arapuni S = +25m.14s., SS = +31m.47s., SSS = +35m.59s.
Uccle PP = +17m.4s., SKKSE = +24m.23s., iPSE = +26m.25s., iPPSE = +26m.57s., SSE = +31m.22s.
Neuchatel ePP = +17m.18s.
Zurich ePP = +17m.27s., e = +26m.6s.
De Bilt PPZ = +17m.23s., eSS = +31m.29s.
Strasbourg ePKP = +16m.23s., iPP = +17m.22s., PPP = +19m.54s., SKKS = +24m.31s., iS = +25m.11s., iPS = +26m.2s., ePPS = +27m.21s., SS = +31m.41s.
Florence PP = +17m.36s., S = +25m.8s., PS = +26m.12s., SS = +31m.41s., i = +32m.24s. and +36m.12s., SSS = +36m.51s., SSSS = +39m.41s.
Chur ePP = +17m.28s.
Stuttgart e = +16m.37s. and +16m.48s., iPP = +17m.31s., ePPP = +20m.0s., eSKS = +24m.4s., iSKKS = +24m.36s., iPS = +26m.31s., eSS = +31m.47s.
Feldberg eE = +17m.32s. =PP +2s., +25m.35s. =S +23s. and +31m.47s. = SS +9s.
Venice P = +13m.45s., S = +24m.57s.
Triest iPP = +17m.47s., i = +18m.5s., iSKKS = +24m.42s., iS = +25m.17s., iPS = +26m.49s., PPS = +27m.40s., iSS = +32m.8s., SSS = +36m.41s., SSSS = +40m.36s.
Hamburg iPPZ = +17m.49s., eN = +21m.47s. =PPPP +24s., iSKKSE = +24m.49s., ePPSE = +26m.51s., iSSE = +32m.12s., eSSSEN = +35m.47s.
Bergen P = +14m.49s., PP = +19m.9s., SS = +27m.49s.
Jena iPEZ = +13m.44s., iPPN = +17m.41s., iPPZ = +17m.43s., iPPE = +17m.48s., eE = +24m.22s., eEN = +24m.51s. =SKKS −6s., eE = +25m.33s. =S +2s., eZ = +26m.41s. =PS −10s., eE = +26m.58s., and +32m.5s. =SS −4s.
Cheb ePP = +17m.57s.,eSS = +27m.15s.
Laibach i = +17m.53s. =PP −2s., ePS = +26m.57s.
Zagreb iPKP = +17m.58s. =PP +3s., iPP = +18m.17s., ePPP = +20m.4s., ePS = +26m.58s., ePPS = +28m.3s., eSS = +32m.14s.

Continued on next page.

Potsdam iEN = +13m.56s., iN = +14m.6s., eNZ = +17m.11s., iPPE = +17m.57s. iPPNZ = +18m.1s., iZ = +18m.16s., iEN = +18m.19s., iN = +18m.24s., iE = +18m.37s., iEN = +19m.11s., ePPPZ = +20m.11s., ePPPEN = +20m.23s., iE = +21m.37s. =PPPP +2s. and +21m.50s., eSKSE = +24m.11s., iSN = +25m.2s. =SKKS −4s., iSE = +25m.6s., iPSEN = +25m.48s., ePSN = +25m.53s., iZ = +27m.9s. =PS +6s. and +28m.14s., eSSN = +32m.17s.
Prague iPP = +18m.3s.
Copenhagen iPP = +18m.2s., i = +24m.56s. =SKKS −15s., eN = +25m.40s. = S −8s. and +25m.59s., PS = +27m.4s., PPS = +28m.15s., SS = +32m.23s.
Suva e = +18m.41s.
Vienna iEN = +15m.18s. and +17m.4s., iPP = +18m.3s., iZ = +19m.8s., and +19m.57s. =PPP −9s., PPP = +20m.21s., iE = +22m.51s., SKKS? = +24m.52s., PS = +27m.12s., iE = +30m.14s., iN = +32m.29s. =SS −9s., PSS = +33m.2s.
Budapest eP = +16m.11s.
Belgrade e = +18m.19s. =PP +3s., +27m.46s. =PS +14s., and +34m.14s.
Athens PP = +18m.33s., SS = +28m.6s. and +28m.10s.
Upsala iPP = +18m.30s., i = +18m.52s. and +24m.42s.?, iN = +26m.30s., iPSE = +28m.7s., iPPSE = +29m.3s., SS = +33m.50s., SSSE = +38m.26s.
Tananarive PP = +19m.15s., SKKSE = +26m.12s., SN = +27m.6s., PS = +28m.21s., SS = +34m.6s.
Lemberg eN = +18m.8s.
Helwan iPP = +18m.54s.
Helsingfors iPPE = +18m.59s., iN = +26m.55s., iPSE = +28m.15s., iPSN = +28m.29s., iSSN = +34m.0s., eSSE = +34m.6s., iSKKSN = +37m.44s., eSSSEN = +39m.6s.; T_0 =8h.9m.33s.
Pulkovo PKP = +18m.10s., iPP = +19m.8s., S = +26m.51s. =SKKS +27s., PS = +28m.56s., PPS = +30m.12s., SS = +34m.53s.
Riverview i = +26m.23s. =SKKS −7s. and +29m.7s. =PS +7s., +35m.13s. = SS +10s., +35m.26s., +35m.57s., and +36m.26s.
Sydney PP = +28m.41s. =PS −19s., iS = +34m.53s. =SS −10s.
Melbourne i = +28m.54s. =PS −7s. and +35m.6s. =SS +2s., e = +42m.31s. = SSSS +0s. and +47m.35s.
Ksara PPP = +22m.3s.
Kucino PPP = +21m.11s.
Adelaide i = +26m.56s. =SKKS −11s., +29m.51s. =SKSP +8s., +36m.21s., and +44m.23s.
Tiflis ePKPEN = +18m.51s., iPPE = +21m.24s., eSKKSE = +27m.48s., PSE = +30m.17s., SSEN = +37m.13s.
Baku ePKP = +19m.0s., iPP = +20m.50s.
Ekaterinburg iPKP = +19m.3s., iPP = +21m.6s., iPKS = +22m.24s., iSS = +38m.17s.
Mizusawa ePN = +19m.44s.
Irkutsk PKS = +23m.8s. =PP +2s., SS = +41m.41s.
Colombo iP = +19m.46s.
Agra ePN = +20m.3s. =PKP_3 +4s.
Nagoya P = +20m.14s. =PKP_3 +8s.
Toyooka ePEN = +20m.13s. =PKP_3 +0s.
Kobe eZ = +18m.25s., iZ = +23m.43s. =PKS +13s., eN = +43m.17s. =SS −1s.
Batavia i = +19m.52s., iN = +23m.41s. =PKS +10s., iZ = +23m.44s., L = +49m.11s.
Sumoto N = +38m.59s., E = +40m.56s., eLN = +42m.27s., eLE = +43m.16s.
Heizyo eE = +23m.58s.
Zinsen ePKPN = +19m.56s., PPNZ = +24m.9s., ePPPZ? = +27m.5s., ePPPE? = +27m.16s., eN = +27m.52s., eE = +29m.11s., eZ = +29m.50s., eN = +29m.53s., eE = +30m.36s., eSKSP? = +34m.7s., SSN = +43m.52s., SSE = +44m.5s., eSSSZ = +49m.53s., eSSSEN = +50m.8s.
Chiufeng iPP = +24m.12s.
Zi-ka-wei iZ = +20m.19s. and +21m.1s. =PKP_3 −2s., LE = +51m.33s. and +59m.41s.
Nanking iN = +21m.4s. =PKP_3 −5s., PP = +24m.45s., PPPZ = +26m.39s., PS = +33m.41s., SS = +40m.1s., SSS = +45m.6s. =SS +16s.
Hong Kong ? = +21m.50s., PP? = +25m.44s., ? = +30m.6s., SS = +46m.51s., SSS? = +47m.7s., ? = +54m.21s.
Phu-Lien PPP? = +25m.41s., PPPP? = +32m.31s.
Long waves were also recorded at Dehra Dun.

Feb. 23d. Readings also at 3h. (Tananarive), 6h. (Hong Kong and Manila), 10h. (Ann Arbor), 11h. (Jena), 13h. (Balboa Heights), 14h. and 16h. (near Tyosi), 17h. (Stuttgart, Hohenheim, and Göttingen), 18h. (Tiflis), 21h. (near Amboina and near Ksara), 23h. (Bagnères).

Feb. 24d. Readings at 0h. (Branner and La Paz), 2h. (La Paz), 5h. (Pasadena, Riverside, Tinemaha, Mizusawa, and Tyosi), 7h. (near Chur), 9h. (Huancayo, Montezuma, and near La Paz), 10h. (Huancayo, La Paz (2), and Montezuma), 16h. (Montezuma and near La Paz (2)), 17h. (Triest, Pulkovo, Huancayo, Montezuma, and La Paz (2)), 18h. (Baku, Ekaterinburg, Copenhagen, De Bilt, Stuttgart, Strasbourg, Uccle, Paris, Florence, Vienna, Huancayo, and La Paz (3)), 19h. (La Paz (2), Tucson, San Juan, and near Port au Prince), 21h. (near Athens), 23h. (Christchurch, San Juan, near Port au Prince, and near Wellington).

Feb. 25d. 23h. 19m. 50s. Epicentre 34°·2N. 22°·4E. N.2.

A = +·765, B = +·315, C = +·562 ; D = +·381, E = −·925 ;
G = +·520, H = +·214, K = −·827.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		3·9	16	e 0 57	+ 1	i 1 56	S*	2·2	2·4
Catania		6·8	302	e 5 45	?	—	—	—	—
Trenta		7·0	319	e 2 10	P_g	—	—	—	—
Helwan		8·7	117	2 0	− 3	—	—	i 7·8	—
Naples	N.	9·3	318	e 2 54	+43	e 6 29	?	—	—
Belgrade		10·7	353	e 2 54	+23	e 4 14	−17	e 5·0	6·3
Ksara		11·2	88	e 2 42	+ 5	—	—	—	—
Zagreb		12·6	339	e 3 5	+ 9	e 7 31	?	—	—
Florence		12·9	322	i 2 57	− 4	7 10	S_g	9·2	10·2
Triest		13·2	333	e 3 24	+19	i 5 26	− 6	—	7·8
Yalta		13·7	38	e 3 10	− 1	—	—	—	—
Padova		13·8	328	e 5 51	S	e 9 16	?	—	—
Simferopol		14·0	36	e 3 20	+ 5	—	—	—	—
Piacenza		14·6	322	5 0	?	—	—	10·2	12·4
Theodosia		14·7	39	e 3 29	+ 4	—	—	—	—
Vienna		14·7	344	e 3 26	+ 1	—	—	e 8·7	11·7
Cheb		17·5	340	e 7 22	S	(e 7 22)	+ 9	(e 9·5)	10·7
Stuttgart		17·6	330	e 4 38_a	+36	e 7 16	+ 1	e 9·7	—
Strasbourg		18·0	327	e 4 10?	+ 3	e 7 31	+ 6	e 10·2	—
Tiflis		19·1	60	e 4 19	− 1	7 50	+ 2	10·4	12·2
Potsdam		19·4	343	i 4 23	0	i 7 56	+ 2	e 11·2	12·9
Paris		20·8	321	—	—	e 8 10?	−12	15·2	15·2
Granada		21·2	285	—	—	e 8 10	−20	e 14·4	—
Uccle		21·2	327	e 5 12?	PP	e 8 44	+14	11·2	—
Hamburg		21·3	340	e 4 43	0	—	—	e 13·0	14·4
De Bilt		21·7	331	—	—	e 8 54	SS	e 11·7	15·0
Copenhagen		22·5	346	—	—	8 57	+ 2	11·2	—
Baku		22·7	66	e 5 16	PP	9 4	+ 5	12·1	15·4
Oxford		24·5	323	—	—	e 9 44	+12	e 14·9	—
Upsala		25·9	355	e 5 28	0	9 55	− 2	e 14·2	17·7
Pulkovo		26·1	9	5 26	− 4	9 57	− 3	13·7	16·9
Ekaterinburg		34·4	37	e 6 40	− 4	e 11 58	−14	18·2	—

Additional readings and note :—
Athens iNZ = +1m.14s. = P_g +2s., iN = +1m.35s., iE = +1m.39s., SEZ = +2m.5s. = S_g +2s.
Florence e = +1m.43s.
Triest ePP? = +4m.18s., i = +5m.51s., and +6m.6s., iSS = +6m.28s., i = +6m.45s.
Cheb gives S as P and L as S.
Potsdam iPN = +4m.46s. ?= PP +12s., iN = +5m.26s., eE = +7m.10s.?, eN = +7m.46s., iN = +8m.14s. = SS +2s.
Hamburg eZ = +4m.46s.
Long waves were also recorded at other European stations.

Feb. 25d. Readings also at 0h. (Chiufeng and Lick), 1h. (Baku, Ekaterinburg, Tiflis, Irkutsk, Pulkovo, Tashkent, Hong Kong, Manila, and Melbourne), 2h. (Copenhagen, De Bilt, and Stuttgart), 3h. (Almata and La Paz), 4h (Ekaterinburg, Pulkovo, Tiflis, Copenhagen, Bombay, Tucson, Sucre, and near La Paz), 5h. (Lick), 6h. (near Tananarive), 7h. (near La Paz and Sucre), 9h. (near Ksara, near Huancayo, and near La Paz), 12h. (Ekaterinburg, Pulkovo, Tiflis, Copenhagen, Budapest, Stuttgart, Athens, Triest, Simferopol, Yalta, Theodosia, and Ksara), 13h. (near Mizusawa, Nagoya, and Tyosi), 15h. (Andijan), 17h. (Wellington), 18h. and 21h. (La Paz), 22h. (Tinemaha), 23h. (Chur, Ksara, and Venice).

Feb. 26d. 1h. 49m. 29s. Epicentre 49°·2N. 8°·0E. N.3.

$A = +\cdot647$, $B = +\cdot091$, $C = +\cdot757$; $D = +\cdot139$, $E = -\cdot990$; $G = +\cdot750$, $H = +\cdot105$, $K = -\cdot653$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Karlsruhe		0·3	124	0 4	0	—	—
Strasbourg		0·7	194	e 0 2	− 8	i 0 12	− 6
Stuttgart		0·9	119	e 0 13	0	e 0 22	− 1
Ravensburg		1·7	143	—	—	e 0 47	+ 3
Zurich		1·9	168	e 0 26	− 2	e 0 46	− 3
Neuchatel		2·3	198	e 0 35	+ 2	e 1 4	+ 5
Chur	N.	2·5	156	e 1 7	S	(e 1 7)	+ 3
Göttingen		2·6	28	e 0 56	P_g	i 1 33	S_g

Additional readings :—
Strasbourg PP = +9s. = P_g +1s.
Ravensburg e = +51s. = S_g +1s.
Göttingen eE = +59s.

Feb. 26d. 2h. 49m. 18s. Epicentre 37°·5N. 13°·5E. N.3.

$A = +\cdot771$, $B = +\cdot185$, $C = +\cdot609$; $D = +\cdot233$, $E = -\cdot972$; $G = +\cdot592$, $H = +\cdot145$, $K = -\cdot793$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mineo		1·0	102	−0 46	−60	—	—	—	—
Catania		1·3	90	0 15	− 3	0 33	0	1·2	1·4
Messina		1·8	67	0 34	P_g	—	—	—	—
Trenta		2·8	51	e 0 32	− 8	1 12	0	—	—
Naples	N.	3·4	9	e 1 31	S	(e 1 31)	+ 4	4·7	—
Florence		6·5	346	1 12	−20	—	—	—	3·1
Prato		6·6	345	e 1 34	0	3 32	S_g	—	5·7
Piacenza		8·0	339	e 2 18	P*	—	—	—	10·0
Triest		8·1	1	0 49	−66	—	—	—	5·4

Long waves were also recorded at other European and Russian stations.

Feb. 26d. 3h. 7m. 38s. Epicentre 48°·4N. 8°·9E. (as on 21d.). X.

$A = +\cdot656$, $B = +\cdot103$, $C = +\cdot748$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Stuttgart	0·4	28	e 0 7	+ 1	i 0 16	+ 6
Hohenheim	0·4	42	0 6	0	e 0 12	+ 2
Ravensburg	0·7	142	e 0 17	S	(e 0 17)	− 1
Karlsruhe	0·7	333	0 22	S	(0 22)	+ 4
Strasbourg	0·8	284	—	—	i 0 27	+ 6
Zurich	1·1	192	e 0 12	− 4	e 0 24	− 4
Chur	1·6	164	e 0 24	+ 1	e 0 42	+ 1
Neuchatel	2·0	223	e 0 28	− 1	e 0 55	+ 4
Göttingen	3·2	12	e 1 6	P_g	i 1 43	S_g

Additional reading :—
Göttingen eE = +1m.9s.

Feb. 26d. 5h. 9m. 42s. Epicentre 27°·5N. 57°·5E. (as on 21d.). X.

A = +·477, B = +·748, C = +·462 ; D = +·843, E = −·537 ;
G = +·248, H = +·389, K = −·887.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Baku		14·3	336	i 3 21	+ 2	5 38	−20	7·3	—
Tashkent		16·8	32	—	—	e 7 35	+38	10·6	12·1
Tiflis	E.	17·6	327	—	—	e 7 30	+15	e 8·1	8·9
Andijan		18·0	39	e 5 0	+53	—	—	—	—
Ksara		19·6	294	e 4 30	+ 5	e 7 56	− 2	—	—
Ekaterinburg		29·4	4	i 5 53	− 7	e 10 22	−33	12·8	—
Pulkovo		37·2	338	—	—	e 13 51	+57	20·3	—

Additional readings :—
Tashkent e = +8m.58s.
Long waves were also recorded at Copenhagen.

Feb. 26d. 9h. 34m. 32s. Epicentre 36°·4N. 121°·3W. N.3.

A = −·418, B = −·688, C = +·593.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Lick	1·0	343	i 0 14a	0	—	—
Branner	1·3	325	i 0 19k	+ 1	i 0 31	− 2
Berkeley	1·7	332	i 0 24	0	i 0 46	+ 2
San Francisco	1·7	326	e 0 24	0	e 0 42	− 2

Additional reading :—
Branner iN = +28s.

Feb. 26d. Readings also at 1h. (Florence, Messina, Catania, Mineo, Hohenheim, Strasbourg, and Stuttgart), 3h. (Hohenheim and Stuttgart), 6h. (Lick, Berkeley, Branner, Tucson, and La Paz), 10h. (near Manila and near Medan), 17h. (La Paz and Stuttgart), 21h. (Baku, Ekaterinburg, Tashkent Tiflis, and Ksara), 23h. (Padova).

Feb. 27d. 16h. 10m. 2s. Epicentre 57°·7S. 143°·8E. (as on 1931 Sept. 25d.). X.

A = −·431, B = +·316, C = −·845 ; D = +·591, E = +·807 ;
G = +·682, H = −·499, K = −·534.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Melbourne		19·9	3	e 5 16?	+47	i 8 20	+16	9·3	9·7
Christchurch		22·8	64	4 58?	− 1	—	—	—	—
Adelaide		23·0	349	e 4 58	− 3	i 9 2	− 3	11·2	13·7
Riverview		24·4	15	e 5 22	+ 8	i 9 8	−22	e 10·7	12·7
Sydney		24·4	15	e 5 22	+ 8	i 9 16	−14	10·7	11·0
Wellington		25·6	64	5 23	− 2	9 40	−11	12·2	15·0
Arapuni		28·5	60	—	—	(12 58?)	?	13·0	—
Perth		32·0	313	11 38	S	(11 38)	+ 3	—	17·0
Suva		47·1	48	e 12 28	?	e 14 34	−46	—	24·0
Medan		71·1	311	e 11 58	+41	e 20 28	− 6	37·0	—
Hong Kong		83·7	333	22 40	SKS	(22 40)	[− 9]	—	38·6
Hyderabad		92·4	300	23 50	SKS	(23 50)	[+ 3]	43·9	47·1
Bombay		96·3	296	—	—	e 23 58	[−10]	—	—
Huancayo		103·3	142	—	—	e 27 47	PS	48·7	—
Irkutsk		114·6	335	—	—	e 26 58?	{+19}	e 50·0	—
Baku		125·1	292	e 22 10	?	e 31 3	PS	54·0	68·5
Tiflis	E.	128·6	289	e 22 44	?	e 38 11	SS	e 62·0	71·8
Ekaterinburg		132·2	313	e 19 26	[+16]	—	—	55·0	—
Pulkovo		136·9	302	e 19 56	[+19]	e 30 6	{+ 1}	77·0	84·5
Alicante		149·9	246	—	—	e 38 47	?	—	—
Granada		150·4	240	e 20 11	{+11}	—	—	75·7	—

For Notes see next page.

NOTES TO FEB. 27d. 16h. 10m. 2s.

Additional readings :—
Melbourne i = +7m.27s.
Adelaide i = +9m.19s., +10m.20s., and +10m.58s.
Riverview i = +5m.30s., eSS = +10m.5s., SSSE = +10m.28s., SSSSE = +10m.40s.
Wellington i = +10m.54s. =SS +10s.
Hong Kong S? = +28m.1s. =SS −7s.
Hyderabad S = +30m.40s. =SS +26s.
Huancayo e = +28m.43s. and +33m.27s.
Irkutsk e = +35m.58s.? =SS +38s.
Ekaterinburg e = +22m.35s. =PKS −8s., +22m.49s., and +39m.7s. =SS +0s.
Pulkovo e = +23m.56s. =PKS +23s.
Long waves were also recorded at Cape Town, La Paz, Tashkent, Ivigtut, and other European stations.

Feb. 27d. 16h. 14m. 47s. Epicentre 36°·4N. 136°·0E. N.3.

A = −·579, B = +·559, C = +·593.

	△	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Toyooka	1·3	228	i 0 17	− 1	i 0 34	+ 1	0·6
Nagoya	1·5	148	i 0 20k	− 1	0 37	− 2	0·7
Osaka	1·7	192	0 26	+ 2	0 49	S*	0·8
Kobe	1·8	201	e 0 25	− 1	i 0 49	+ 3	0·9
Sumoto	2·2	203	0 37	P$_g$	1 3	S*	1·1
Koti	3·5	215	—	—	e 1 41	S*	—

Feb. 27d. Readings also at 2h. (near Malabar), 4h. (Andijan (2) and Tiflis), 10h. (Berkeley, Branner, and Lick), 11h. (La Paz), 12h. (Almata), 14h. (Melbourne), 15h. (Adelaide, Riverview, and Wellington), 16h. (Manila and near Batavia), 21h. (Andijan), 23h. (Adelaide, Riverview, Sydney, Wellington, and Ksara).

Feb. 28d. 4h. 18m. 9s. Epicentre 34°·0S. 57°·0E. (as on Jan. 21d.). X.

A = +·452, B = +·695, C = −·559.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tananarive		17·3	329	4 0	+ 2	7 8	− 1	7·6	8·7
Tiflis	E.	76·5	351	e 11 52	+ 3	e 21 29	− 8	e 32·8	—
Ekaterinburg		90·9	3	e 12 57	− 5	e 23 53	−11	41·8	—
Tinemaha		175·0	311	i 20 7	[+ 1]	—	—	—	—
Riverside	Z.	175·3	271	i 20 6	[0]	—	—	—	—
Pasadena	Z.	176·0	273	i 20 7	[0]	—	—	—	—

Tananarive SS = +7m.22s.
Long waves were also recorded at Baku, Granada, and San Fernando.

Feb. 28d. 8h. 46m. 15s. Epicentre 33°·7N. 139°·0E. (as on 1927 Sept. 12d.). R.3.

A = −·628, B = +·546, C = +·555 ; D = +·656, E = +·755 ;
G = −·419, H = +·364, K = −·832.

	△	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Nagoya	2·3	311	i 0 29	− 4	0 55	− 4	—
Tyosi	2·6	37	e 0 38	+ 1	0 55	−12	—
Osaka	3·1	288	0 44	0	1 32	S*	2·0
Kobe	3·3	289	0 48	+ 1	1 26	+ 1	1·5
Sumoto	3·5	281	e 0 51	+ 1	e 1 30	0	2·4

Additional readings :—
Osaka i = +1m.19s. =S −1s.
Sumoto eSN = +1m.33s.

Feb. 28d. 22h. 19m. 29s. Epicentre 51°·5N. 29°·5W. (as on 1932 Jan. 27d.). X.

A = ·+542, B = −·307, C = +·783; D = −·492, E = −·870;
G = +·681, H = −·385, K = −·623.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Kew	18·1	79	—	—	e 7 31?	+ 4	—	—
Paris	20·5	85	—	—	(e 8 31?)	SS	e 8·5	11·5
Toledo	21·1	113	4 41	0	—	—	—	—
Uccle	21·1	78	—	—	(e 7 31?)	−57	e 7·5	—
De Bilt	21·2	74	—	—	e 8 31?	+ 1	—	12·8
Malaga	23·1	120	i 5 1	− 1	9 19	+12	—	14·2
Granada	23·2	118	i 5 6k	+ 3	i 9 24	+16	11·8	—
Strasbourg	23·9	82	—	—	(e 9 31?)	+10	e 9·5	—
Alicante	24·2	112	—	—	e 9 40	+13	—	—
Stuttgart	24·7	81	—	—	e 9 43	+ 7	e 12·0	—
Copenhagen	24·9	64	—	—	(10 31?)	SS	10·5	—
Triest	28·8	84	—	—	10 31?	−14	—	—
Tinemaha	61·2	294	e 10 10	− 3	—	—	—	—

Granada gives also PP = +5m.23s., P_cP = +8m.24s.
Long waves were also recorded at Edinburgh and San Fernando.

Feb. 28d. Readings also at 0h. (Pulkovo, Simferopol, Yalta, Tiflis, Stuttgart, Florence, Piacenza, Zagreb, Athens, and near Ksara), 1h. (Baku, Ekaterinburg, Copenhagen, Strasbourg, Paris, and Triest), 4h. (near Sumoto), 5h. (Andijan), 6h. (Nagoya and near Tyosi), 7h. (Berkeley, Lick, and near Tyosi), 8h. (near Nagoya (2)), 9h. (Melbourne, Pasadena, Riverside, and Tinemaha), 10h. (near Amboina), 12h. (near Nagoya), 14h. (Alicante), 15h. (near Tyosi (2)), 17h. (Tucson), 18h. (near La Paz (2)), 19h. (Alicante and Lick), 20h. (near Kobe and Sumoto), 23h. (Ekaterinburg and near Amboina).

March 1d. 2h. 13m. 44s. Epicentre 48°·3N. 9°·0E. (as on 1931 Dec. 11d.). R.3.

A = +·657, B = +·104, C = +·747; D = +·156, E = −·988;
G = +·737, H = +·117, K = −·665.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Stuttgart		0·4	16	0 7a	+ 1	i 0 16	+ 6	—	—
Hohenheim		0·5	19	i 0 6	− 1	i 0 14	+ 1	—	—
Ravensburg		0·6	141	0 8	− 1	i 0 17	+ 2	—	—
Karlsruhe		0·8	332	0 15	+ 4	0 25	+ 4	—	—
Strasbourg		0·9	289	i 0 13k	0	i 0 26	+ 3	—	—
Zurich		1·0	197	e 0 12	− 2	e 0 26	0	—	—
Chur		1·5	166	e 0 23	+ 2	i 0 42	+ 3	—	—
Neuchatel		1·9	227	e 0 28	0	e 0 59	S_g	—	—
Feldberg		2·0	349	0 3	−26	—	—	—	0·2
Cheb		2·8	51	e 0 47	S*	e 1 28	S_g	—	1·5
Jena	E.	3·0	32	e 0 49	P*	(i 1 33)	S_g	i 1·6	1·7
Göttingen		3·3	12	e 0 57	P_g	(i 1 40)	S_g	i 1·7	1·9
Prague		4·0	62	—	—	e 1 57	S*	—	2·6
Paris		4·3	280	—	—	e 2 16?	S_g	—	—
Vienna		4·9	88	e 1 57	S*	2 39	S_g	—	2·8
Hamburg		5·3	7	—	—	e 2 16?	+ 1	—	—
Zagreb		5·4	115	—	—	e 2 24?	+ 6	e 2·8?	—

Additional readings:—
Stuttgart i_q = +14s.
Hohenheim i_q = +12s.
Strasbourg PS = +30s.
Neuchatel iP_g = +31s.
Feldberg iEN = +7s.
Jena iE = +53s., +1m.0s., and +1m.15s.
Göttingen iEN = +1m.1s., iE = +1m.8s.
Vienna i = +2m.30s.

March 1d. 16h. :—
Shock in North China for which readings are as follows :—
Chiufeng eP =16h.17m.5s., S =21m.38s., i =22m.38s. and 23m.9s.
Andijan eP =16h.18m.18s.
Nanking eP =16h.18m.28s., SN =24m.10s.
Tchimkent eP =16h.18m.49s.
Almata eP =16h.18m.50s.
Ekaterinburg P =16h.20m.4s., eS =25m.3s., L_Q =29m.42s., L_R =31m.30s.
Pulkovo e =16h.22m.21s. and 32m.27s., L =38m.
Tashkent e =16h.22m.33s., 22m.47s., and 25m.21s., eL =25m.12s., M =26m.42s.
Hong Kong P? =16h.23m.5s., M =27m.14s.
Samarkand eP =16h.24m.30s.
Bombay eN =16h.25m., eE =16h.26m.
Phu-Lien 16h.25m.
Medan e =16h.30m.
Baku e =16h.30m.56s., L =35m.24s.
Long waves also at Copenhagen, De Bilt, Stuttgart, and Tiflis.

March 1d. Readings also at 2h. (near Sumoto), 3h. (Tiflis), 4h. (Sucre and near La Paz), 6h. (La Paz, La Plata, Montezuma, Sucre, and near Santiago), 7h. (Nagasaki), 11h. (near Taihoku), 12h. (near Nagoya), 14h. (near Mizusawa), 15h. (Amboina), 17h. (La Plata), 20h. (Adelaide, Melbourne, Riverview, Sydney, Perth, Wellington, and near Andijan), 21h. (Amboina, Baku, Ekaterinburg, and Tiflis), 23h. (Amboina and near Balboa Heights).

March 2d. 8h. 10m. 5s. Epicentre 12°·3N. 144°·0E. N.3.

A = −·790, B = +·574, C = +·213 ; D = +·588, E = +·809 ;
G = −·172, H = +·125, K = −·977.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Palau	10·6	243	2 27	− 2	4 49	+21	—	—
Siomisaki	22·4	342	5 2	+ 7	9 8	+15	—	—
Amboina	22·5	226	4 57	+ 1	8 58	+ 3	—	—
Manila	22·5	279	5 0k	+ 4	9 3	+ 8	12·1	—
Osaka	23·6	343	4 53	−13	8 49	−27	—	10·3
Kobe	23·8	342	e 5 49	+41	—	—	e 11·0	—
Kumamoto	23·8	331	5 21	PP	—	—	—	—
Kumagaya	24·2	351	5 13	+ 1	—	—	—	—
Nagano	24·9	349	5 17	− 2	—	—	—	—
Hong Kong	30·1	294	7 1	PP	10 59	− 7	—	14·8
Phu-Lien	36·7	288	6 55?	− 9	—	—	—	—
Andijan	68·2	309	e 11 0	+ 1	—	—	—	—
Tashkent	70·5	310	e 11 50	+36	e 20 21	− 6	e 32·2	36·7
Baku	85·1	310	—	—	e 23 6	− 3	39·9	52·5
Tinemaha	88·6	52	i 12 52	+ 1	—	—	—	—
Pasadena	89·4	55	i 12 55	0	—	—	—	—
Mount Wilson	89·5	55	i 12 55	0	—	—	—	—
Riverside	90·1	55	i 12 58	0	—	—	—	—
Pulkovo	90·8	332	e 12 58	− 3	—	—	46·9	—
De Bilt	106·5	335	—	—	e 27 55?	PS	e 53·9	—
La Paz	N. 148·6	101	e 19 47	[+ 7]	—	—	—	—

Additional readings :—
Osaka i = +5m.59s.
Kobe ePZ = +6m.5s., eZ = +6m.15s.
Long waves were also recorded at Ekaterinburg and Uccle.

March 2d. 17h. 31m. 1s. Epicentre 39°·1N. 144°·7E. N.1.
(as given by Tokyo and other Japanese stations).

Probable error of epicentre ±0°·22.

A = −·633, B = +·448, C = +·631 ; D = +·578, E = +·816 ;
G = −·515, H = +·364, K = −·776.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Miyako		2·1	284	0 34	+ 4	1 3	S_g	—	—
Isinomaki		2·7	256	0 39	0	1 1	− 8	—	—
Mizusawa		2·8	271	i 0 38	− 2	—	—	—	—
Morioka		2·8	282	0 38	− 2	1 13	+ 1	—	—
Sendai		3·1	254	0 43	− 1	1 19	− 1	—	—
Urakawa		3·4	334	0 44	− 5	—	—	—	—
Aomori		3·5	301	0 46	− 4	1 40	S*	—	—
Hukusima		3·6	249	0 48	− 3	1 8	P_g	—	—
Akita		3·6	281	0 51	0	1 38	+ 6	—	—
Kusiro		3·9	357	0 49	− 7	1 26	−14	—	—
Obihiro		4·0	344	0 58	+ 1	1 56	S*	—	—
Nemuro		4·2	9	0 57	− 3	1 50	+ 2	—	—
Mito		4·3	232	0 59	− 2	1 58	+ 8	—	—
Muroran		4·3	320	0 58	− 3	1 58	+ 8	—	—
Kakioka		4·6	233	1 3	− 3	2 3	+ 5	—	—
Tyosi		4·6	221	e 1 3	− 3	1 59	+ 1	—	3·0
Sapporo		4·7	330	1 3	− 4	—	—	—	—
Tukubasan		4·7	234	1 4	− 3	1 54	− 6	—	—
Asahigawa		4·9	341	1 8	− 2	2 7	+ 2	—	—
Tokyo		5·2	230	1 13a	− 1	2 13	0	—	7·7
Maebasi		5·2	240	1 12	− 2	2 12	− 1	—	—
Kumagaya		5·2	237	1 11	− 3	2 15	+ 2	—	—
Takada		5·5	250	1 20	+ 2	2 31	+11	—	—
Yokohama		5·5	230	1 19	+ 1	2 29	+ 9	—	—
Nagano		5·7	247	1 22	+ 1	2 34	+ 9	—	—
Mera		5·8	224	1 21	− 1	2 32	+ 4	—	—
Hunatu		5·9	235	1 24	0	—	—	—	—
Kohu		6·0	237	1 24	− 1	2 48	+15	—	—
Numadu		6·1	231	1 28	+ 1	2 44	+ 8	—	—
Misima		6·1	232	1 28	+ 1	2 37	+ 1	—	—
Wazima		6·4	257	1 29	− 2	2 47	+ 4	—	—
Toyama		6·4	250	1 32	+ 1	—	—	—	—
Omaesaki		6·9	231	1 40	+ 2	3 26	S*	—	—
Hamamatu		7·1	235	1 48	+ 7	3 3	+ 2	—	—
Hatidyozima		7·2	215	1 44	+ 2	3 10	+ 6	—	—
Nagoya		7·3	240	1 49	+ 5	3 22	+16	—	3·7
Gihu		7·3	243	1 46	+ 2	3 13	+ 7	—	—
Ootomari		7·7	350	1 45	− 4	3 54	S*	—	6·0
Hikone		7·8	243	1 55	+ 4	3 34	+15	—	—
Kameyama		7·8	239	1 53	+ 2	3 3	−16	—	—
Kyoto		8·3	242	1 58	0	3 48	+17	—	—
Toyooka		8·6	248	i 2 0	− 2	i 3 51	+12	—	5·8
Osaka		8·6	242	2 1	− 1	4 3	S*	—	5·3
Osaka	B.	8·6	242	2 5	+ 3	4 0	S*	—	—
Kobe		8·8	243	2 5a	0	3 44	0	e 4·3	5·4
Wakayama		9·1	241	2 6	− 3	4 35	S*	—	—
Siomisaki		9·2	235	2 3	− 7	3 58	+ 4	—	—
Sumoto		9·2	242	i 2 10a	0	4 21	S*	—	5·4
Tokusima		9·6	241	2 0	−16	3 43	−20	—	—
Sikka		10·2	354	2 11	−13	—	—	—	—
Koti		10·6	242	e 2 26a	− 3	e 4 27	− 1	—	5·9
Hamada		10·9	251	2 35	+ 2	4 51	+15	—	—
Matuyama		11·0	245	2 33	− 2	5 11	S*	—	—
Simidu		11·4	240	2 41	+ 1	5 17	+29	—	—
Titizima		12·2	191	2 46	− 5	5 5	− 3	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hukuoka		12·8	249	3 2	+ 3	e 5 20	− 2	e 5·9	7·2
Hukuoka	B.	12·8	249	2 56	− 3	5 52	+30	—	—
Kumamoto		12·9	245	2 59	− 2	6 4	S*	—	—
Miyazaki		12·9	240	2 58	− 3	5 36	+11	—	—
Taikyu		13·1	261	3 5a	+ 2	5 32	+ 3	6·5	8·6
Husan		13·1	257	3 2	− 1	5 44	+15	—	—
Nagasaki		13·6	247	e 3 10	0	5 44	+ 3	6·5	—
Keizyo		13·9	269	3 16	+ 2	5 47	− 2	—	—
Zinsen		14·2	269	i 3 18a	0	5 57	+ 1	—	5·2
Tomie		14·5	248	3 30	+ 8	6 36	+33	—	—
Heizyo		14·7	277	e 3 21	− 4	6 14	+ 6	7·8	8·7
Mukden		16·4	286	3 48	+ 2	6 43	− 5	—	—
Nake		16·6	234	3 50	+ 1	7 6	SS	—	—
Dairen		17·9	277	4 5	0	7 34	+12	—	—
Naha		19·2	233	4 39	+18	8 19	+29	—	—
Zi-ka-wei		20·5	255	i 4 33	− 2	8 33	SS	11·2	14·1
Chiufeng		22·0	282	4 46k	− 5	i 8 48	+ 2	e 10·5	13·3
Nanking		22·1	260	4 49	− 3	9 5	+17	11·2	—
Isigakizima		22·8	236	4 58	− 1	9 10	+ 9	—	—
Taihoku		24·0	241	5 11	+ 1	9 35	+12	11·5	18·5
Hokoto		26·4	241	e 5 34	+ 1	e 10 19	+14	e 12·7	14·6
Hong Kong		30·9	246	6 15	+ 2	11 22	+ 4	—	21·0
Manila		32·2	226	6 25k	+ 1	11 29	− 9	16·1	19·0
Palau		33·1	198	6 34	+ 1	11 57	+ 5	—	—
Phu-Lien		37·3	251	i 7 11	+ 2	13 6	+10	—	—
Amboina		45·5	203	i 8 15	− 2	15 5	+ 8	18·6	—
Almata		49·8	298	i 8 54	+ 4	16 16	+18	24·0	—
Calcutta		50·3	267	9 13	+19	16 34	+29	26·7	31·1
Honolulu T.H.		51·9	92	i 9 13	+ 7	i 16 57	+30	—	—
Sitka		52·9	41	i 9 15	+ 2	—	—	—	—
Andijan		53·8	296	i 10 20	+60	18 24	+91	27·0	33·5
Dehra Dun		54·3	282	9 19	− 4	16 49	−10	21·0	32·0
Medan		54·7	241	i 9 24	− 2	e 17 59	+54	—	—
Tchimkent		55·1	299	i 9 31	+ 1	17 27	+16	28·0	—
Ekaterinburg		55·1	318	i 9 27	− 3	i 17 4	− 7	29·0	—
Tashkent		55·7	298	i 9 36	+ 2	—	—	—	—
Agra		55·9	278	9 33	− 2	17 35	+14	—	—
Batavia		57·3	226	i 9 40k	− 5	i 18 7	+27	29·8	37·8
Malabar		57·7	225	e 9 53	+ 5	e 18 25	+39	25·1	53·8
Samarkand		58·0	297	9 37	−13	17 57	+ 8	—	—
Hyderabad		60·9	269	10 7	− 4	18 43	+15	—	—
Victoria	E.	63·0	48	10 24	− 1	(18 51)	− 4	18·9	51·2
Seattle		63·9	48	e 10 33	+ 2	i 19 35	+29	—	—
Bombay		64·4	273	10 34	− 1	19 24	+12	34·5	45·1
Suva		65·4	144	9 53?	−48	18 41	−44	32·0	35·0
Kodaikanal		66·0	263	i 10 44	− 1	i 19 35	+ 3	—	42·6
Colombo		66·3	258	10 54	+ 7	19 59?	PS	35·0	37·0
Apia		66·7	133	e 10 53	+ 3	19 53	PS	—	35·4
Kucino		66·7	324	10 46	− 4	19 30	−11	29·9	54·7
Spokane		66·7	47	i 10 51	+ 1	i 19 51	+10	30·7	—
Pulkovo		67·4	330	i 10 52	− 2	19 46	− 4	27·0	37·2
Ukiah		67·9	57	i 10 59	+ 1	i 20 12	PS	e 28·0	—
Baku		68·9	305	i 11 5	+ 1	—	—	—	—
Helsingfors		69·1	333	i 11 5	0	20 15	+ 5	e 29·0	—
Berkeley		69·2	57	e 11 5k	− 1	e 20 23	PS	—	—
Branner		69·5	58	e 11 5	− 3	i 21 4	(+ 2)	—	—
Lick		69·9	57	e 11 10	0	e 20 26	+ 6	—	—
Tiflis		71·4	309	e 11 15	− 4	i 20 38	0	36·8	—
Bozeman		71·4	45	i 11 21	+ 2	i 20 49	+11	30·3	—
Upsala		71·9	335	i 11 19	− 3	i 20 41	− 3	e 31·0	37·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tinemaha		72·3	56	i 11 21	− 4	i 21 0	+12	—	—
Santa Barbara		72·8	59	e 11 26	− 2	e 21 6	+12	—	—
Haiwee	N.	73·0	56	e 11 27	− 2	—	—	—	—
Riverview		73·2	174	i 11 28k	− 2	i 20 54	− 5	i 30·9	37·4
Sydney		73·2	174	e 12 11	+41	i 20 59	0	38·0	40·8
Pasadena		74·1	58	i 11 30	− 5	i 21 27	+17	30·9	—
Mount Wilson		74·1	58	e 11 30	− 5	—	—	—	—
Adelaide		74·3	185	i 11 28	− 8	i 21 2	−10	i 31·5	51·2
Riverside		74·6	58	i 11 34	− 4	i 21 23	+ 8	—	—
Theodosia		74·7	316	11 38	− 1	21 17	0	31·0	—
Bergen		75·0	341	12 38	+58	22 20	+60	34·0	43·0
Simferopol		75·3	317	11 43	+ 1	21 26	+ 2	26·3	—
La Jolla		75·4	59	e 11 43	0	e 21 28	+ 3	—	—
Yalta		75·6	316	11 41	− 3	21 24	− 3	28·0	51·3
Sebastopol		75·9	317	11 46	+ 1	21 32	+ 2	28·0	—
Perth		76·0	205	i 11 44	− 2	21 29	− 3	—	—
Reykjavik		76·2	354	11 51	+ 4	21 55	PS	30·8	—
Copenhagen		76·9	335	i 11 47	− 4	21 40	− 2	32·0	—
Lemberg	E.	76·9	325	e 12 1	+10	e 21 53	+11	e 26·7	50·9
	N.	76·9	325	e 11 52	+ 1	e 21 52	+10	e 26·8	50·0
Melbourne		77·0	179	e 11 56	+ 4	21 39	− 4	32·3	37·3
Denver		78·7	47	e 12 3	+ 2	e 21 4	−58	e 32·0	—
Ivigtut		79·1	6	11 59	− 4	22 5	− 1	35·0	—
Potsdam		79·3	332	i 12 2	− 2	i 21 57	−11	e 32·0	44·0
Hamburg		79·4	335	i 12 4k	− 1	e 21 59	−10	e 35·8	39·0
Prague		80·7	330	i 12 20	+ 8	i 22 27	+ 4	e 27·0	44·0
Budapest		80·8	326	i 12 12	0	22 41	+17	e 27·0	44·0
Jena	N.	81·0	331	e 12 29	+16	—	—	—	—
Göttingen		81·1	333	i 12 12k	− 2	i 22 27	0	e 33·0	39·2
Edinburgh		81·1	342	i 12 15	+ 1	i 22 33	+ 6	—	—
Cheb		81·4	330	i 12 15	0	e 22 41	+10	e 36·0	52·2
Vienna		81·4	328	e 12 10k	− 5	22 46	+15	e 28·0	52·0
Hof		81·4	331	e 12 13	− 2	e 22 30	− 1	e 34·0	45·0
Durham		81·8	340	12 16	− 1	22 39	+ 4	—	—
Ksara		81·8	307	i 12 18	+ 1	i 22 36	+ 1	38·7	45·7
De Bilt		82·2	336	i 12 20k	+ 1	22 37?	− 2	e 36·0	45·0
Belgrade		82·2	323	i 12 19a	0	i 22 37	− 2	e 37·7	43·3
Arapuni		82·3	156	12 26	+ 6	22 56	+16	41·5	43·0
New Plymouth		82·7	157	(11 59?)	−23	—	—	12·0	—
Feldberg		82·7	334	e 12 20	− 2	e 22 41	− 3	e 34·0	43·1
Stonyhurst		82·8	341	i 12 20	− 2	i 22 44	− 1	34·0	47·0
Liverpool		83·3	341	i 12 19	− 6	—	—	—	49·0
Zagreb		83·4	326	i 12 22	− 3	e 22 50	− 1	e 36·7	53·8
Bidston		83·4	341	i 12 19	− 6	22 39	−12	—	49·5
Uccle		83·6	337	i 12 27k	+ 1	i 23 0	+ 7	37·0	53·9
Stuttgart		83·7	332	12 27	0	i 22 57	+ 3	e 37·5	45·2
Karlsruhe		83·8	333	11 29	−58	22 9	−46	e 43·0	52·0
Laibach		83·9	327	e 12 25k	− 3	i 23 3	+ 7	e 42·6	55·1
Takaka		84·0	158	(8 59?)	?	—	—	9·0	—
Madison		84·3	36	i 12 30	0	i 23 0	− 1	—	—
Kew		84·4	338	i 12 30k	0	i 23 0	− 2	e 36·0	89·0
Oxford		84·4	340	i 12 29k	− 1	i 22 49	[− 6]	e 36·0	45·0
Strasbourg		84·4	333	i 12 31k	+ 1	23 4	+ 2	e 40·0	46·0
Triest		84·5	328	i 12 30k	− 1	i 23 7	+ 4	e 35·0	56·3
Wellington		85·0	158	12 30	− 3	22 59	[0]	42·1	44·0
Chur		85·1	331	e 12 31	− 3	e 23 6	− 3	—	—
Treviso		85·1	328	i 12 32	− 2	23 6	− 3	42·0	56·0
Zurich		85·1	332	e 12 31	− 3	e 22 58	[− 2]	—	—
Venice		85·3	328	i 12 33	− 2	22 59	[− 2]	41·2	46·0
Padova		85·4	328	12 42	+ 7	23 8	− 4	41·0	61·0
Athens		85·8	317	i 12 35	− 2	i 23 9	[+ 4]	i 29·5	30·1
Paris		85·9	336	i 12 38	0	i 23 15	− 2	30·0	45·0
Glenmuick		86·0	158	14 11	PP	25 11	?	44·2	52·3
Neuchatel		86·0	332	e 12 35	− 3	e 23 2	[− 4]	—	—
Chicago		86·1	36	i 12 39	0	i 23 11	[+ 4]	e 40·0	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Christchurch		86·4	159	12 57	+17	23 33	+12	37·0	—
Pavia		86·5	331	12 40	− 1	—	—	—	—
Sion		86·5	332	e 12 43	+ 2	e 24 18	PS	—	—
Piacenza		86·6	330	i 12 43	+ 2	i 23 19	− 4	40·0	—
Florence		87·0	328	12 45	+ 2	i 23 29	+ 2	37·5	45·0
Taranto		87·0	323	i 12 40	− 3	i 23 28	+ 1	28·6	61·0
Prato		87·0	328	i 12 45	+ 2	i 23 34	+ 7	32·4	46·0
Florissant		87·1	40	i 12 44	0	23 32	+ 4	e 40·9	47·8
Helwan		87·3	307	i 12 43	− 2	i 23 7	[− 8]	45·6	62·7
Sienna		87·4	328	12 39	− 6	23 39	+ 8	47·0	—
St. Louis		87·4	40	e 12 39	− 6	i 23 23	[+ 7]	i 36·5	43·8
Ann Arbor		87·5	34	i 12 47	+ 2	i 23 23	[+ 6]	i 35·9	53·3
Livorno		87·6	328	12 51	+ 5	23 31	− 2	—	—
Denton		87·7	47	i 12 48	+ 2	i 23 37	+ 3	38·1	47·4
Ottawa		88·0	27	i 12 47	− 1	i 23 24	[+ 4]	e 39·0	—
Grenoble		88·0	332	i 12 35	−13	23 31	− 6	39·0	—
Rome		88·1	326	12 47	− 1	e 23 39	+ 1	38·5	51·0
Toronto		88·1	30	i 12 52	+ 4	i 23 24	[+ 3]	i 41·0	47·0
Naples	N.	88·1	325	e 12 53	+ 5	e 23 43	+ 5	45·0	62·0
Casamicciola		88·4	324	12 41	− 9	23 15	[− 8]	33·8	—
Puy de Dôme		88·4	334	i 12 52	+ 2	i 23 54	+13	37·0	—
Trenta		88·4	322	i 13 4	+14	i 22 59	[−24]	41·8	56·5
Buffalo		89·0	30	i 12 53	0	i 23 25	[− 1]	29·0	—
Little Rock		89·2	44	i 12 54	0	i 23 47	− 1	e 37·5	46·8
Marseilles		89·7	331	i 13 3	+ 7	24 2	+ 9	39·0	—
Messina		89·7	322	12 51	− 5	23 29	[− 2]	—	—
Cincinnati		89·7	36	i 13 0	+ 4	i 23 58	+ 5	—	—
Catania		90·4	322	12 54	− 5	24 8	+ 8	43·3	58·5
Pittsburgh		90·6	32	i 13 5	+ 5	i 23 52	−10	—	—
Mineo		90·9	322	12 54	− 8	—	—	—	—
East Machias		91·3	22	i 13 26	+23	—	—	—	—
Bagnères		91·8	334	e 13 5	− 1	24 13	0	39·0	—
Carloforte		92·2	327	e 13 9	+ 1	—	—	—	—
Harvard		92·2	26	e 13 11	+ 3	i 23 35	[−11]	e 30·5	—
Halifax		92·5	19	13 15	+ 6	24 29	+10	43·0	—
Barcelona		92·5	333	13 11	+ 2	24 18	− 1	39·6	43·1
Fordham		92·6	28	i 13 12	+ 3	i 23 57	{+ 1}	42·5	—
Woodstock		92·8	31	e 13 5	− 5	23 54	{− 3}	42·6	50·0
Georgetown		93·1	31	i 13 12	0	24 31	+ 6	—	—
Charlottesville		93·2	33	i 13 13	+ 1	i 23 55	{− 6}	e 39·0	—
Tunis		93·3	324	i 13 21	+ 8	—	—	—	—
Tortosa		93·6	333	i 13 14	0	24 13	{+ 9}	39·1	53·2
Columbia		95·5	36	e 13 24	+ 1	24 11	[+ 8]	—	—
Toledo		96·0	336	13 25	0	i 24 42	− 9	i 41·0	48·7
Alicante		96·2	333	e 13 26	0	e 24 25	{+ 1}	e 40·9	57·6
Algiers		96·3	329	i 13 28	+ 2	24 57	+ 3	i 41·4	59·0
Almeria		98·2	334	e 13 38	+ 3	e 24 36	{− 4}	e 43·6	58·4
Granada		98·3	335	i 13 37	+ 1	—	—	48·3	57·8
Malaga		99·0	335	i 13 40	+ 1	24 57	{+11}	42·7	61·4
San Fernando		99·8	336	13 8	−35	24 44	{− 8}	42·5	—
Tananarive		107·2	259	14 24	+ 7	25 12	[+12]	51·4	63·6
Port au Prince		112·7	38	e 14 54	+10	29 8	PS	e 50·9	—
San Juan		115·6	32	i 15 5	+ 7	—	—	—	—
Balboa Heights		116·7	50	e 19 54	PP	e 26 59	{+ 5}	e 49·0	—
Dakar		123·7	339	18 46	[− 8]	26 4	[+ 3]	—	62·0
Johannesburg		126·2	263	19 5	[+ 6]	28 5	{+ 8}	—	—
Huancayo		135·5	64	i 19 19	[+ 3]	—	—	—	—
Cape Town		137·2	259	16 42	− 2	30 29	?	62·0	83·0
La Paz		143·5	60	i 19 26k	[− 3]	27 1	SKS	69·0	105·3
Montezuma		147·1	69	20 29	[+52]	—	—	—	—
Sucre		147·3	60	i 20 45	[+67]	27 54	SKS	72·0	—
Santiago		151·1	90	19 46	[+ 3]	—	—	—	—
La Plata		161·4	84	19 59	[+ 4]	—	—	67·0	—

For Notes see next page.

NOTES TO MARCH 2d. 17h. 31m. 1s.

Additional readings :—
Tyosi iP = +1m.12s. =P* −4s., P_g = +1m.38s.
Wazima +2m.22s.
Nagoya P_g = +2m.2s.
Ootomari P_g = +1m.55s.
Toyooka iZ = +2m.3s., iEN = +2m.6s., iS = +3m.59s.
Osaka i = +2m.7s., +2m.13s., +2m.20s., +2m.35s., and +3m.11s.
Kobe i = +2m.21s., eSNW = +3m.55s.
Sumoto SE = +4m.26s., SZ = +4m.32s. =S* +0s.
Koti ePEN =+2m.31s., iPZ =+2m.38s., iS* =+4m.49s., iS_g =+5m.13s. =S*+0s.
Nagasaki i = +3m.13s.
Zinsen iN = +3m.27s. and +3m.34s.
Heizyo iP = +3m.23s.
Zi-ka-wei PPN = +5m.3s., PPPPE? = +5m.17s., iE = +5m.31s., +5m.57s., and +7m.29s., PSE? = +8m.47s., SSE = +9m.34s., SSSE = +9m.53s.
Chiufeng iPEN = +4m.53s.
Nanking iSE = +9m.10s.
Hong Kong ? = +6m.20s.
Amboina i = +8m.29s.
Honolulu T.H. i = +9m.17s., e = +16m.13s., i = +16m.23s.
Medan i = +9m.27s. and +9m.50s.
Agra PN = +9m.44s.
Batavia iPZ = +9m.43s.
Malabar i = +10m.25s.
Seattle i = +10m.43s. and +10m.52s.
Suva i = +11m.53s., PP = +14m.29s., SS = +23m.11s., SSS = +26m.41s., SSSS = +29m.29s.
Spokane iSS = +22m.0s., i = +26m.22s.
Ukiah e = +19m.53s. =S −3s.
Helsingfors iP_cPZ = +11m.48s., iP_cPEN = +12m.1s., iPPE = +14m.18s., iPPNZ = +14m.22s., iPPPEZ = +15m.25s., iPPPN = +15m.32s., iSN = +20m.22s., iSZ = +20m.30s., iS_cSZ = +21m.9s., iSKSZ = +21m.24s., iZ = +22m.8s., iE = +22m.32s., eZ = +24m.28s. =SS −1s., iN = +24m.42s., eSSSEN = +27m.49s., eSSSZ = +28m.7s. ; T_0 =17h.30m.55s.
Berkeley iEZ = +11m.23s. =P_cP −7s., eE = +20m.13s. =S +2s., eSZ = +20m.28s., iE = +28m.14s.
Branner eN = +11m.8s., iN = +11m.12s., iEN = +11m.31s. =P_cP +0s., eGN = +28m.5s.
Tiflis PPN = +14m.7s., PPPN = +15m.53s., SSN = +25m.30s.
Bozeman SS = +25m.23s.
Upsala iPP = +14m.5s., iPPP = +15m.50s., iPSN = +21m.28s., iSSE = +25m.32s., iSSSE = +28m.31s.
Riverview iE = +11m.43s., +12m.5s., and +12m.43s., iN = +19m.2s., iE = +20m.57s., iN = +21m.0s., iE = +21m.9s., and +21m.18s., iN = +21m.21s. and +21m.34s., iE = +21m.52s., +22m.17s. and +25m.22s., iN = +25m.31s., +25m.56s., and +26m.19s., iE = +26m.34s.
Sydney SS = +23m.29s., SSS = +27m.29s., SSSS = +32m.47s.
Pasadena i = +11m.34s., iPPZ = +14m.40s., iPPPZ = +17m.23s., i = +21m.49s.
Adelaide iP_cP = +11m.45s., i = +11m.49s., +12m.12s., +21m.10s., and +22m.31s., iSS = +25m.44s., +25m.49s., i = +26m.9s., +26m.21s., and +29m.22s.
Bergen PP = +15m.25s., PPP = +17m.23s., SS = +27m.43s., SSS = +30m.50s.
Reykjavik e = +12m.46s. and +18m.31s., PS = +22m.23s., SSS = +30m.5s.
Copenhagen iP = +11m.51s., +12m.3s., ePP = +14m.41s., +14m.53s., +15m.2s. PPP +16m.37s., iN = +21m.56s. =PS −10s., iE = +22m.5s., SS = +26m.41s.
Melbourne iP = +12m.6s., i = +16m.26s. =PPP +8s. and +18m.51s.
Denver iEN = +21m.45s.
Ivigtut iNZ = +12m.2s., PP = +15m.13s., eEZ = +16m.47s. =PPP +10s., EN = +17m.23s., PSZ = +22m.53s., eN = +23m.19s., SSN = +27m.11s.
Potsdam iP_cPEN = +12m.16s., iPPEN = +15m.23s., iPPPEN = +17m.2s., iSKSN = +22m.1s., iPSE = +22m.18s., iSKKSEN = +22m.34s., iE = +22m.57s., iSSE = +27m.22s., iSSN = +27m.38s., iSSSN = +31m.12s.
Hamburg iPPZ = +15m.10s., iPSZ = +22m.53s., eSSZ = +27m.41s.
Prague ePP = +15m.28s.
Göttingen iP_cP = +13m.28s., iPP = +15m.27s., ePPP = +17m.4s. =PPP +9s., ePPPPE = +18m.5s., iN = +19m.7s., iSN = +22m.32s., i = +23m.5s. = PS +2s., eEN = +23m.41s., eSS = +27m.23s., iSSSEN = +30m.41s., eEZ = +32m.23s.
Edinburgh i = +12m.21s. and +12m.35s., PP = +15m.26s., PPP = +17m.16s.
Cheb ePP? = +15m.6s., ePPP = +17m.14s., eSS = +28m.4s.
Vienna iPZ = +12m.14s., iZ = +14m.17s., PP = +15m.35s., iZ = +21m.36s., PS = +23m.21s., PPS? = +23m.41s.
Hof ePZ = +12m.21s., iPNE = +12m.25s., iPZ = +12m.27s., iPNW = +12m.30s., iPPNW = +14m.59s., iPPZ = +15m.18s., iPPNE = +15m.22s., iZ = +16m.59s., iNE = +17m.5s., eSNE = +21m.59s., eNW = +27m.39s., eNE = +27m.59s.
Ksara iPPP = +17m.20s., SS = +28m.9s., SSS = +32m.13s.

Continued on next page.

Durham PP = +14m.57s.
Belgrade iNE = +12m.30s., iNW = +12m.43s. and +15m.24s. =PP +2s., iNE = +15m.30s., iZ = +15m.35s., iSNW = +22m.48s.
Arapuni SS = +27m.59s.?, SSS? = +34m.20s., i = +36m.59s.
Feldberg iEN = +12m.29s., iN = +12m.37s., and +12m.58s., iEN = +13m.5s., iN +15m.39s. eE = +15m.41s. and +26m.59s., eN = +28m.35s.
Zagreb iP$_c$P = +12m.36s., iPP = +15m.50s., iPPP = +17m.38s., iPPPP = +19m.10s., iSKS = +23m.47s., ePS = +24m.34s., iPPS = +25m.8s., eSS = +28m.59s., iPKKPE = +32m.17s., eSSS = +32m.47s., iSSSS = +34m.56s.
Bidston PPPP = +17m.24s.
Uccle iPPZ = +15m.47s., iSN = +23m.3s., iSKKSN = +23m.29s., iPSE = +23m.55s., iE = +27m.59s., iSS = +28m.36s.
Stuttgart iP$_c$P = +12m.47s., iPP = +15m.54s., iPPP = +17m.40s., iSKKS = +23m.31s., eSS = +28m.59s., eSSS = +32m.47s. ; T$_0$ =17h.30m.55s.
Laibach ePNE = +12m.28s., eNE = +12m.38s., iNE = +13m.56s., +15m.52s., +17m.39s., and +21m.38s., eLNE = +32m.38s.
Madison iPP = +15m.47s., iSS = +28m.40s. ; T$_0$ =17h.31m.6s.
Kew i = +12m.34s. and +12m.38s., iPP = +15m.57s., iPPPEZ = +18m.3s., iSKSE = +22m.50s., iNZ = +22m.56s., iPSZ = +23m.52s., iZ = +24m.2s , iE = +24m.31s., +27m.58s., +28m.8s., and +28m.15s. =SS −3s., SSN = +28m.42s. ?
Strasbourg iPP = +15m.58s., iPPP = +17m.43s., ePPPP = +19m.25s., eSKKS = +23m.17s., PS = +24m.4s., SS = +28m.38s., eSSS = +33m.2s., eSSSS = +35m.4s.
Triest iPP? = +15m.52s., i = +16m.18s., +17m.29s., and +17m.52s., iSKS = +22m.57s., iPS = +23m.52s.
Wellington SS = +29m.4s., SSS = +32m.19s., SSSS = +35m.21s.
Zurich ePP = +16m.10s.
Athens PP = +15m.54s., PPP = +17m.55s., ePS = +22m.52s.
Paris PP = +16m.6s., SS = +28m.55s.
Glenmuick PP = +17m.29s. =PPP −10s., i = +20m.53s., +23m.5s. =SKS −1s., +24m.11s. =PS +7s., +29m.35s., +38m.29s., and +41m.53s.
Neuchatel ePP = +16m.0s.
Sion ePP = +16m.21s.
Florence PP = +16m.23s., i = +25m.29s., +28m.44s. =SS +13s., +29m.59s., and +32m.59s.
Florissant iEN = +12m.49s., iSKSE = +23m.23s. ; T$_0$ =17h.30m.57s.
Helwan i = +12m.51s.
St. Louis iPEN = +12m.45s., iP$_c$PEN = +12m.57s., iEN = +13m.33s., ePPEN = +16m.15s., eSKSE = +23m.18s., eSSE = +29m.28s. ; T$_0$ =17h.31m.6s.
Ann Arbor iPP = +16m.23s., iPPPN = +17m.59s., iSS = +29m.35s., iSSS = +33m.17s. ; T$_0$ =17h.30m.36s.
Denton eSKS = +23m.23s.
Ottawa iPP = +16m.25s., iPPPP = +19m.46s., iSKKSE = +23m.36s. =S −1s., ePPPSZ = +24m.48s., eSS = +28m.53s., eSSSN = +33m.5s.
Grenoble PP = +16m.23s., SKS = +22m.59s.
Toronto iPP = +16m.27s., iSS = +29m.24s. ; T$_0$ =17h.31m.17s.
Puy de Dôme PP = +16m.23s., SKS = +23m.25s., PS = +24m.53s.
Buffalo i = +15m.39s., iPP = +16m.29s.
Little Rock iEN = +13m.2s., iSKSE = +23m.36s.
Marseilles PP = +16m.43s., PPP = +18m.35s., SKS = +23m.33s.SS = +30m.57s.
Cincinnati iNZ = +13m.6s., iSKSZ = +23m.33s., iSKSN = +23m.40s.
Pittsburgh iPP = +16m.42s., iSKS = +23m.12s.
Bagnères PP = +16m.52s., PPP = +19m.2s., PPPP = +20m.52s., SKS = +23m.49s., SS = +29m.59s. ?
Harvard e = +14m.29s., +15m.59s., and +20m.29s. ; T$_0$ =17h.31m.0s.
Halifax PP = +17m.6s., PPP = +19m.29s., SKKS = +24m.18s., PS = +25m.47s., SS = +30m.35s. ; T$_0$ =17h.31m.0s.
Barcelona PP = +17m.7s., PPPP = +20m.37s., PS = +25m.37s.
Fordham iPP = +16m.53s., iPPP = +19m.6s.
Woodstock iP = +13m.12s., PP = +16m.52s., i = +24m.19s. =S −3s.
Georgetown PP = +16m.48s., SKS = +23m.48s. ; T$_0$ =17h.30m.54s.
Charlottesville iPP = +16m.59s., e = +22m.59s., i = +24m.29s. =S +3s., iPS = +25m.51s., iSS = +30m.27s.
Columbia iPP = +17m.28s., e = +25m.48s. =PS −8s., SS = +31m.25s.
Toledo PP = +17m.26s., PPP = +19m.56s., PPPP = +20m.59s., SKS = +24m.11s., PS = +25m.14s., SS = +30m.49s., SSS = +34m.44s., SSSS = +37m.5s.
Alicante iP = +13m.35s., PP = +16m.45s., PPPP = +18m.45s., SS = +31m.7s.
Algiers iPP = +17m.31s., PPP = +20m.9s., SKS = +24m.9s., PS = +26m.0s., SS = +30m.35s., eSS = +36m.27s.
Almeria iP = +13m.44s., PP = +17m.34s., PPP = +21m.32s., SS = +30m.36s.
Granada P$_c$P = +13m.42s., PP = +17m.45s., PPP = +20m.19s.
Malaga P$_c$P = +13m.49s., PP = +17m.42s., PPP = +19m.35s., SKS =+23m.49s., PS = +26m.11s., PPS = +26m.43s., SS = +31m.42s., SSS = +35m.54s.
San Fernando PN = +13m.46s., PE = +13m.49s., PN = +13m.59s., SN = +24m.48s., S = +24m.59s.
Tananarive PKPE = +18m.18s., PP = +18m.42s., iN = +19m.4s., iE = +19m.7s. PPP = +21m.9s., PS = +28m.12s., SS = +33m.48s., SSS = +38m.6s., N = +45m.59s. ?

Continued on next page.

Port au Prince PP = +19m.30s., PPP = +22m.2s., PPS = +30m.12s., SS = +35m.29s., SSS = +39m.37s.
San Juan iPKP = +19m.3s., i = +19m.38s. = PP +0s., iPPP = +23m.10s., i = +28m.21s.
Dakar PP = +20m.44s., SKSP = +30m.50s., SS = +38m.13s.
Johannesburg +21m.5s. = PP +13s., +31m.11s. = PS +13s., and +38m.5s. = SS +13s.
Huancayo iPP = +22m.0s.
Cape Town +19m.24s., +19m.41s., +19m.54s. = PP −10s., +22m.33s., +25m.56s., +35m.41s., +36m.15s., +41m.28s., +42m.41s., and +46m.11s.
La Paz ipPE = +21m.27s.
Santiago PKP_2 = +20m.13s., SS = +43m.40s.
La Plata PP = +24m.37s.

March 2d. 18h. 26m. 22s. Epicentre 39°·0N. 144°·0E. (as given by Tokyo) N.3.

A = −·629, B = +·457, C = +·629; D = +·588, E = +·809;
G = −·509, H = +·370, K = −·777.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		4·1	218	e 1 6	P*	e 2 2	S*	—	2·9
Nagoya		6·8	238	e 1 55	P*	3 35	S_g	—	3·9
Toyooka		8·0	247	i 1 55	+ 2	—	—	—	—
Osaka		8·0	240	e 1 30	−23	2 48	?	—	4·9
Kobe		8·3	241	1 58	0	e 3 53	S*	e 4·6	—
Koti		10·0	240	e 2 20	− 1	—	—	—	—
Taikyu		12·6	260	3 4	+ 8	—	—	—	—
Keizyo		13·4	268	3 8	+ 1	6 13	S*	—	—
Zinsen		13·7	269	3 11	0	—	—	—	—
Nanking		21·6	259	4 43	− 3	e 8 57	+19	—	—
Almata		49·2	298	e 8 46	+ 1	—	—	—	—
Andijan		53·4	296	e 9 38	+21	—	—	—	—
Samarkand		57·6	297	e 9 38	− 9	—	—	—	—
Tinemaha	Z.	72·8	56	e 11 25	− 3	—	—	—	—
Haiwee	Z.	73·6	56	e 11 34	+ 2	—	—	—	—
Pasadena		74·6	58	e 11 58	+20	—	—	—	—
Neuchatel	N.	85·9	332	e 12 38	0	—	—	—	—

Additional readings :—
Tyosi iS = +2m.27s.
Toyooka ePN = +2m.10s. = P* −4s.

March 2d. 19h. 41m. 55s. Epicentre 39°·4N. 143°·2E. (as given by Tokyo). N.2.

A = −·619, B = +·463, C = +·635; D = +·599, E = +·801;
G = −·508, H = +·380, K = −·773.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		4·1	207	e 0 58	0	1 47	+ 2	—	2·6
Nagoya		6·5	232	1 31	− 1	3 6	S*	—	3·9
Osaka		7·7	235	1 48	− 1	3 39	S*	—	4·6
Toyooka		7·7	243	i 1 54	+ 5	i 3 37	S*	—	4·6
Kobe		8·0	237	e 2 1	+ 8	—	—	e 4·0	5·0
Sumoto	E.	8·3	236	1 56	− 2	3 50	+19	—	5·0
	N.	8·3	236	2 6	+ 8	3 53	+22	—	4·8
Koti	Z.	9·7	236	e 2 25	+ 8	—	—	6·7	—
Hukuoka		11·8	245	4 9	?	e 6 26	S_g	—	—
Taikyu		12·1	258	2 53	+ 3	—	—	—	—
Nagasaki		12·7	243	e 2 59	+ 1	e 5 21	+ 1	7·0	7·6
Keizyo		12·8	266	(3 8)	+ 9	—	—	3·1	—
Zinsen		13·1	267	2 54	− 9	—	—	—	—
Heizyo		13·5	275	3 3	− 6	—	—	—	—
Nanking		21·1	257	4 35	− 6	e 9 4	+36	—	—

Additional readings :—
Tyosi iP = +1m.4s. = P* −3s., S_g = +2m.11s.
Nagoya P_g = +1m.43s. = P* −5s.
Toyooka iSZ = +3m.44s.
Kobe ePE = +2m.4s. and +2m.12s. = P* −2s.
Sumoto ePZ = +2m.10s.

March 2d. 20h. 42m. 56s. Epicentre 39°·7N. 143°·7E. (as on 1929 March 15d.). R.2

A = −·620, B = +·455, C = +·639; D = +·592, E = +·806; G = −·515, H = +·378, K = −·769.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		2·1	254	i 0 30	0	i 0 57	+ 3	—	—
Tyosi		4·6	210	e 1 3	− 3	1 49	− 9	—	3·1
Ootomari		6·9	354	e 1 45	+ 7	—	—	—	—
Nagoya		7·2	233	1 40	− 2	3 8	+ 4	—	3·6
Toyooka	E.	8·2	242	i 1 55	− 1	i 3 37	+ 8	—	5·2
	N.	8·2	242	e 1 53	− 3	i 3 32	+ 3	—	4·9
	Z.	8·2	242	i 1 55	− 1	i 3 44	+15	—	5·6
Osaka		8·3	235	1 25	−33	3 32	+ 1	—	5·5
Kobe		8·5	237	1 58	− 2	3 43	+ 7	—	4·8
Sumoto		8·8	235	1 58	− 7	3 54	+10	—	5·0
Koti		10·2	236	e 2 24	0	4 19	+ 1	e 5·5	6·3
Hukuoka		12·3	244	2 59	+ 7	e 5 20	+10	—	—
Taikyu		12·8	257	2 57	− 2	5 47	+25	e 6·4	8·7
Nagasaki		13·2	242	e 3 4	− 1	e 5 37	+ 5	7·0	7·4
Keizyo		13·2	266	3 8	+ 3	—	—	—	—
Zinsen		13·5	266	3 10	+ 1	—	—	—	—
Heizyo		13·9	273	4 13	+59	e 6 48	+59	9·2	—
Nanking		21·5	257	4 42	− 3	8 45	PcP	11·4	—
Amboina		45·7	203	e 8 21	+ 3	i 14 55	− 5	—	—
Almata		48·8	298	e 8 54	+12	—	—	—	—
Andijan		52·9	296	e 9 10	− 3	e 17 3	+22	e 38·1	—
Tchimkent		54·2	299	e 9 22	− 1	—	—	27·1	—
Medan		54·4	241	i 9 48	+24	i 16 58	− 3	—	—
Samarkand		57·1	299	e 9 34?	−10	—	—	—	—
Batavia		57·2	226	i 9 59	+14	i 18 32	+53	—	—
Pulkovo		66·5	330	10 48	− 1	19 46	PS	37·1	39·8
Tinemaha		72·8	56	e 11 31	+ 3	—	—	—	—
Haiwee	E.	73·3	56	e 11 44	+13	—	—	—	—
Pasadena		74·4	58	e 11 40	+ 3	—	—	—	—
Mount Wilson		74·4	58	e 11 40	+ 3	—	—	—	—
Riverside	Z.	74·9	58	e 11 44	+ 4	—	—	—	—
La Jolla		75·8	59	e 11 51	+ 6	—	—	—	—
Copenhagen		76·0	335	11 46	0	—	—	41·1	—
Florissant	E.	87·2	39	e 12 59	+15	e 23 26	− 3	—	—
La Paz	Z.	143·9	59	20 23	[+52]	—	—	—	—

Additional readings :—
Tyosi iS = +2m.3s.
Kobe iE = +2m.13s., iZ = +2m.19s., iN = +2m.23s., eSEZ = +3m.47s.
Sumoto PZ = +2m.3s., SE = +3m.59s., SZ = +4m.14s. =S* +6s.
Batavia eE = +7m.4s.
Long waves were also recorded at De Bilt, Stuttgart, and Ivigtut.

March 2d. 21h. 48m. 29s. Epicentre 39°·4N. 143°·2E. (as at 19h.). X.

Osaka gives 39°·2N. 143°·0E.

A = −·619, B = +·463, C = +·635.

		△	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Mizusawa	E.	1·6	261	i 0 23	0	i 0 37	− 4	—
Tyosi		4·1	207	e 0 54	− 4	1 48	+ 3	2·3
Nagoya		6·5	232	e 1 41	+ 9	e 2 53	+ 7	—
Osaka		7·7	235	1 43	− 6	3 34	+18	5·2
Kobe	N.	8·0	237	—	—	e 3 48	S*	—

Additional readings :—
Mizusawa SN = +47s. =S* −2s.
Kobe eN = +4m.50s., eE = +5m.5s. and +6m.38s.

March 2d. 22h. 34m. 55s. Epicentre 39°·7N. 143°·7E. (as at 20h.). X.

Near the position given by Japanese stations 39°·6N. 143°·7E.

A = −·620, B = +·455, C = +·639; D = +·592, E = +·806;
G = −·515, H = +·378, K = −·769.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	2·1	254	i 0 28	− 2	i 1 4	S_g	—	—
	N.	2·1	254	0 31	+ 1	0 55	+ 1	—	—
Tyosi		4·6	210	i 1 11	+ 5	e 2 21	S_g	—	—
Nagoya		7·2	233	e 1 49	+ 7	3 13	+ 9	—	4·5
Osaka		8·3	235	1 54	− 4	4 5	S*	—	5·5
Kobe	E.	8·5	237	e 2 12	+12	e 4 5	S*	—	5·5
	N. or Z.	8·5	237	e 2 8	+ 8	e 3 49	+13	—	5·9
Sumoto	E.	8·8	235	2 12	+ 7	e 4 12	S*	—	4·9
	N.	8·8	235	e 2 23	+18	4 27	S*	—	5·1
Chiufeng		21·1	280	e 4 36	− 5	8 25	− 3	e 11·2	12·8
Nanking		21·5	257	e 4 41	− 4	—	—	—	—
Mount Wilson	Z.	74·4	58	i 11 33	− 4	—	—	—	—
Pasadena	Z.	74·4	58	i 11 33	− 4	—	—	—	—

Additional readings :—
Sumoto SZ = +4m.16s. =S* −4s.
Long waves were also recorded at Keizyo, Koti, and Zinsen.

March 2d. Local shocks connected with that at 17h. were recorded at Japanese stations as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 20	15	45	e 20	16	9	e 22	43	46	e 22	44	13
i 20	23	3	i 20	23	32				e 22	47	1
e 20	34	21	i 20	34	39				e 22	54	36
21	5	33	i 21	5	59				e 22	56	54
e 21	18	25	e 21	18	50				e 23	0	56
i 21	21	42	i 21	22	4	e 23	11	53	e 23	12	16
			e 21	56	49				e 23	23	0
i 21	59	10	i 21	59	38				e 23	39	34
i 22	1	58	i 22	2	23				e 23	41	35
i 22	12	13	e 22	12	30	e 23	48	12	e 23	48	45
e 22	16	25	i 22	16	47				e 23	52	52
e 22	22	31	e 22	23	0	e 23	58	5	i 23	58	28
e 22	27	19	e 22	27	49						
			e 22	31	36						

Tyosi.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 17	42	17	e 19	32	41	19	33	41
e 17	50	18							19	39	38
			e 17	52	33	e 19	57	57	19	58	40
e 17	58	17							20	8	24
			e 18	8	0	e 20	16	3	20	16	50
			e 18	18	34	e 20	24	47	20	25	40
e 18	26	12							e 21	7	25
			e 18	34	8				21	26	10
i 18	37	13	18	38	8	e 22	0	14	22	1	7
e 18	44	36	18	45	23	e 22	2	48	22	3	42
i 18	50	13	18	51	7				22	12	29
e 19	10	49				i 22	44	7	22	44	55
e 19	14	50	19	15	48				23	46	16
e 19	28	53	19	29	51	e 23	58	30	23	59	13

Continued on next page.

Nagoya.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 18	20	12	20	16	50	20	18	12
e 18	45	27	e 18	46	58	e 20	24	55	e 20	26	23
e 18	50	18	e 18	51	48	e 21	7	25	21	8	54
e 19	12	1	e 19	13	3	e 21	23	26	e 21	24	29
e 19	16	14	19	17	32	e 22	1	54	22	2	38
e 19	29	46	19	31	5	e 22	3	39	22	4	48
e 19	34	10	e 19	35	23	e 23	59	49	e 24	0	59
e 20	9	11									

Osaka.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
18	50	43	18	52	55	22	3	45	22	5	44
20	17	13	20	19	17						

Kobe.

P.			S.			P.			S.		
h.	m.	s.				h.	m.	s.	h.	m.	s.
e 18	42	15				e 18	51	10	e 18	52	17

March 2d. Readings also at 0h. (Berkeley, Branner, and Lick), 3h. (Lick), 4h. (Adelaide, Melbourne, Riverview, Wellington, Amboina, Manila, and Chiufeng), 11h. (Wellington and near Manila), 12h. (near Amboina), 15h. (Christchurch), 16h. (Lick), 17h. (Kobe), 18h. (La Paz, Florissant, Glenmuick, New Plymouth, near Christchurch, and Wellington), 20h. (La Paz), 21h. (Neuchatel and Tashkent), 22h. (Tucson, La Jolla, Riverside, Mount Wilson, Pasadena, Santa Barbara, Haiwee, Tinemaha, Florissant, Little Rock, Chicago, and Neuchatel), 23h. (near Batavia, Malabar, and Soengei Langka).

March 3d. 0h. 18m. 19s. Epicentre 39°·1N. 145°·2E. N.3.

The position is given by Tokyo for the shock at 16h.11m.

A = −·637, B = +·443, C = +·631; D = +·571, E = +·821; G = −·518, H = +·360, K = −·776.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Mizusawa	N.	3·1	271	0 46	+ 2	1 7	−13	—
Tyosi		4·8	227	e 1 9	+ 1	e 2 12	+ 9	2·7
Nagoya		7·6	242	e 1 47	− 1	3 9	− 5	—
Osaka		8·9	243	2 3	− 3	4 14	S*	5·9
Kobe		9·2	244	e 2 0	−10	e 3 58	+ 4	5·7
Sumoto		9·6	243	e 2 22	+ 8	4 28	+27	6·5
Koti		10·9	243	—	—	e 4 41?	+ 5	—
Keizyo		14·3	270	3 3	−16	6 51	+53	—
Nanking		22·5	260	e 4 47	− 9	—	—	—
Tinemaha	Z.	72·0	57	i 11 37	+14	—	—	—
Mount Wilson	Z.	73·8	59	i 11 39	+ 6	—	—	—
Pasadena	Z.	73·8	59	i 11 39	+ 6	—	—	—

Additional readings:—
Kobe eN = +2m.8s., eE = +2m.15s., eZ = +4m.15s.
Sumoto ePN = +2m.29s.
Long waves were also recorded at Chiufeng, Hong Kong, and other Russian and European stations.

March 3d. 2h. 19m. 33s. Epicentre 15°·0N. 120°·0E. N.2.

A = −·483, B = +·836, C = +·259 ; D = +·866, E = +·500 ;
G = −·129, H = +·224, K = −·966.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		1·0	114	i 0 27k	+13	0 42	+16	—	—
Hong Kong		9·2	324	2 16	+ 6	3 46	− 8	4·3	5·7
Taihoku		10·1	8	2 27	+ 5	—	—	—	—
Phu-Lien		13·9	297	2 27?	−47	—	—	—	—
Palau		16·1	117	3 45	+ 2	—	—	—	—
Zi-ka-wei		16·2	4	3 43	− 1	6 43	0	—	15·4
Nanking		17·1	356	i 3 59	+ 4	e 7 18	+14	—	—
Nagasaki		19·8	25	e 4 16	−11	6 48	?	—	—
Miyazaki		19·9	30	4 12	−17	7 15	−49	—	—
Amboina		20·4	156	e 5 1	+27	—	—	—	—
Hukuoka	B.	20·8	25	4 46	+ 8	8 19	− 3	—	—
Koti		22·2	31	e 4 53	0	e 8 48	− 2	—	—
Zinsen		23·2	14	e 4 54	− 9	e 9 4	− 4	—	—
Keizyo	N.	23·4	14	5 1	− 4	9 5	− 7	—	—
Sumoto		23·5	32	e 5 5	0	9 5	− 9	—	9·2
Kobe		23·9	32	5 8k	− 1	—	—	—	7·5
Medan		23·9	244	5 17	+ 8	9 22	+ 1	—	—
Osaka		24·1	33	4 59	−12	(10 11)	SS	10·2	—
Toyooka		24·4	30	5 14	0	—	—	—	—
Heizyo		24·5	11	5 17	+ 2	—	—	—	—
Batavia		24·9	213	e 5 33	+14	9 54	+15	—	—
Nagoya		25·2	34	4 6	−76	5 31	P	—	—
Chiufeng		25·3	353	e 5 20	− 3	9 40	− 6	—	—
Kohu		26·5	35	5 50	+16	—	—	—	—
Kodaikanal		41·8	268	7 51	+ 4	—	—	—	—
Bombay		45·2	282	e 8 27	+13	—	—	—	—
Almata		46·3	316	e 8 32	+ 9	—	—	—	—
Andijan		48·6	311	e 8 39	− 2	—	—	—	—
Tashkent		50·9	311	8 59	+ 1	i 16 11	− 2	e 25·7	33·9
Tchimkent		51·0	313	e 8 57	− 2	—	—	—	—
Samarkand		52·2	308	e 8 59	− 9	—	—	—	—
Ekaterinburg		60·9	327	i 10 9	− 2	i 18 20	− 8	27·4	—
Baku		65·3	308	i 10 41	0	i 19 21	− 3	33·4	39·4
Theodosia		75·7	314	11 43	− 1	—	—	—	—
Yalta		76·5	313	11 46	− 3	—	—	—	—
Simferopol		76·6	314	11 48	− 1	—	—	—	—
Pulkovo		76·9	329	11 47	− 4	e 21 24	−18	35·4	46·9
Sebastopol		77·0	313	11 52	0	—	—	—	—
Copenhagen		87·1	327	12 42	− 2	23 56	+28	46·4	—
Zagreb		88·7	317	e 12 49	− 2	—	—	—	—
Triest		90·2	318	e 22 7	?	(23 42)	[+ 8]	—	23·7
Chur		92·4	321	e 13 6	− 3	e 23 56	[+ 9]	—	—
Zurich		92·8	321	e 13 8	− 2	—	—	—	—
Tinemaha	Z.	104·4	45	i 17 52	PP	—	—	—	—
Pasadena	Z.	106·0	47	e 18 14	[+ 9]	—	—	—	—
Riverside	Z.	106·7	47	i 18 22	[+15]	—	—	—	—
La Paz	Z.	172·0	102	20 44	[+39]	—	—	—	—

Additional readings :—
Zi-ka-wei iZ = +4m.11s. and +9m.7s.
Amboina i = +5m.41s.
Zinsen e = +5m.0s. and +5m.30s.
Sumoto SNZ = +5m.28s., SE = +5m.37s.
Kobe iN = +5m.37s., eE = +5m.43s.
Chiufeng i = +5m.51s. = PP − 3s.
Long waves were also recorded at Taikyu and other European stations.

March 3d. 4h. 37m. 55s. Epicentre 39°·0N. 143°·5E. (as on 1929 March 27d.). X.

The Japanese stations give a very near position 39°·0N. 143°·6E.

A = −·625, B = +·462, C = +·629; D = +·595, E = +·804;
G = −·506, H = +·374, K = −·777.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	1·8	274	i 0 32	P_g	i 0 57	S_g	—	—
	N.	1·8	274	e 0 34	P_g	e 1 3	S_g	—	—
Tyosi		3·9	231	e 0 52	− 4	1 37	− 3	—	2·2
Nagoya		6·5	236	1 41	+ 9	2 57	+11	—	3·1
Toyooka		7·7	246	i 2 11	P*	i 3 53	S*	—	—
Osaka		7·8	238	1 49	− 2	—	—	3·7	5·1
Kobe		8·0	240	e 1 53	0	e 3 25	+ 1	—	5·1
Sumoto		8·3	239	e 2 1	+ 3	e 3 29	− 2	—	—
Koti		9·7	239	e 2 5?	−12	—	—	7·4	—
Taikyu		12·2	260	e 2 47	− 4	—	—	—	—
Nagasaki		12·7	245	e 1 57	−61	—	—	—	—
Keizyo		13·0	269	3 7	+ 5	—	—	e 7·0	—
Zinsen		13·4	269	3 10	+ 3	—	—	e 7·1	—
Zi-ka-wei	Z.	19·6	253	4 23	− 2	8 23	+25	12·0	13·9
Chiufeng		21·1	282	i 4 41a	0	8 35	+ 7	10·2	13·9
Nanking		21·2	259	4 45	+ 3	8 41	+11	13·2	—
Hong Kong		30·0	245	6 11	+ 6	11 9	+ 5	—	17 1
Phu-Lien		36·5	251	7 5?	+ 3	—	—	—	—
Almata		49·0	298	e 9 13	+29	—	—	—	—
Andijan		53·0	296	e 9 13	− 1	e 16 22	−20	—	—
Tchimkent		54·4	299	e 9 53	+29	—	—	—	—
Ekaterinburg		54·5	318	i 9 27	+ 2	17 12	+10	26·1	37·0
Tashkent		55·0	299	i 9 40	+11	—	—	e 30·1	33·9
Bombay		63·4	273	10 29	+ 1	19 8	+ 8	—	41·6
Pulkovo		67·1	330	e 10 46	− 6	—	—	—	40·4
Baku		68·3	305	e 11 29	+29	e 22 15	?	33·1	43·9
Mount Wilson	Z.	75·0	58	i 11 32	− 8	—	—	—	—
Pasadena		75·0	58	i 11 32	− 8	—	—	—	—
Riverside	Z.	75·5	58	e 11 37	− 6	—	—	—	—
Copenhagen		76·6	335	16 5?	PPP	—	—	40·1	—
Florence		86·7	328	e 11 35	−67	—	—	—	35·1

Additional readings:—
Tyosi S_g = +2m.3s.
Toyooka iPN = +2m.15s. = P* +6s.
Kobe eSZ = +3m.41s. = S* −15s.
Sumoto iN = +2m.36s., eZ = +2m.49s.
Zi-ka-wei iZ = +4m.41s.
Tashkent e = +14m.28s. and +23m.11s.
Long waves were also recorded at Medan, Ukiah, and other European stations.

March 3d. 9h. 12m. 57s. I. } Epicentre 39°·4N. 143°·2E. R.1.
9h. 38m. 48s. II. } (as on 2d. 19h.) R.2.

Probable error of shock I ±0°·18.

A = −·619, B = +·463, C = +·635; D = +·599, E = +·801;
G = −·508, H = +·380, K = −·773.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Mizusawa	1·6	261	i 0 24	+ 1	i 1 0	+19	—	—
II	1·6	261	i 0 25	+ 2	i 0 49	S_g	—	—
I Tyosi	4·1	207	i 0 58	0	1 58	S*	—	2·4
II	4·1	207	i 0 59	+ 1	1 56	S*	—	2·7
I Nagoya	6·5	232	1 42	P*	3 17	S*	—	3·7
II	6·5	232	1 24	− 8	3 7	S*	—	4·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Ootomari		7·3	357	e 1 43	− 1	—	—	5·8	—
I Osaka		7·7	235	1 43	− 6	—	—	3·6	5·0
II		7·7	235	1 52	+ 3	3 42	S*	—	4·8
I Toyooka		7·7	243	i 1 52	+ 3	i 3 26	+10	—	4·4
II	E.	7·7	243	i 2 2	P*	i 3 36	S*	—	—
II	N.	7·7	243	i 2 1	P*	i 3 28	+12	—	5·7
II	Z.	7·7	243	e 1 53	+ 4	—	—	—	—
I Kobe		8·0	237	1 54	+ 1	3 25	+ 1	4·4	4·6
II		8·0	237	e 1 53	0	e 3 38	+14	—	4·4
I Sumoto	E.Z.	8·3	236	1 58	0	4 4	S*	—	4·7
I	N.	8·3	236	2 11	+13	4 13	S*	—	4·6
II		8·3	236	2 0	+ 2	e 4 8	S*	—	4·8
I Koti	E.	9·7	236	e 2 17	0	—	—	e 4·5	—
II		9·7	236	2 24	+ 7	—	—	6·2	—
I Sikka		9·8	359	(1 48)	−30	(4 18)	+10	(4·3)	(6·4)
II		9·8	359	(1 45)	−33	(4 9)	+ 1	(4·2)	(7·9)
I Hukuoka		11·8	245	2 43	− 3	e 5 3	+ 5	6·2	8·0
II		11·8	245	2 49	+ 3	e 6 6	S*	—	8·4
I Taikyu		12·1	258	2 54	+ 4	5 34	+29	6·5	—
II		12·1	258	e 2 52	+ 2	e 5 30	+25	e 6·6	—
I Nagasaki		12·7	243	2 57	− 1	5 39	+19	—	—
II		12·7	243	2 59	+ 1	5 31	+11	—	—
I Keizyo		12·8	266	3 2	+ 3	5 46	+24	6·9	9·8
II		12·8	266	3 1	+ 2	5 38	+16	7·6	—
I Zinsen		13·1	267	3 4	+ 1	e 6 16	+47	—	—
II		13·1	267	3 7	+ 4	—	—	e 7·1	—
I Heizyo		13·5	275	3 11	+ 2	e 5 53	+14	7·1	—
II		13·5	275	3 10	+ 1	e 6 3	+24	7·2	—
I Zi-ka-wei	Z.	19·4	252	4 22	− 1	8 17	SS	11·5	13·1
II		19·4	252	e 4 24	+ 1	—	—	—	13·5
I Chiufeng		20·7	281	i 4 35a	− 2	i 8 16	− 4	i 10·3	11·9
II		20·7	281	4 35k	− 2	8 18	− 2	10·3	13·0
I Nanking		21·1	257	4 38	− 3	8 46	+18	e 12·2	—
II		21·1	257	i 4 37	− 4	8 47	+19	—	—
I Hong Kong		29·9	244	6 7	+ 3	11 13	+10	14·2	20·2
I Manila		31·6	224	6 16	− 3	11 35	+ 6	17·6	—
I Phu-Lien		36·3	251	e 7 2	+ 2	—	—	21·0	—
I Amboina		45·2	201	8 39	+25	14 57	+ 3	—	—
I Almata		48·6	298	e 8 47	+ 6	—	—	e 29·9	—
I Calcutta		49·1	267	5 27	?	12 42	?	23·5	—
I Andijan		52·7	296	e 9 13	+ 1	—	—	e 31·0	—
II		52·7	296	e 9 10	− 2	—	—	e 32·2	—
I Sitka		53·5	42	—	—	i 16 56	+ 7	22·7	—
I Medan		53·8	241	i 9 24	+ 4	i 17 3	+10	e 29·0	32·0
I Tchimkent		54·0	299	e 9 28	+ 7	—	—	e 31·0	—
I Ekaterinburg		54·1	318	9 23	+ 1	17 1	+ 4	33·9	35·5
II		54·1	318	—	—	16 59	+ 2	—	35·4
I Tashkent		54·6	299	e 10 10	+44	e 17 27	+23	—	37·4
I Agra	E.	54·7	278	9 23	− 3	e 16 56	− 9	—	—
I Batavia		56·6	224	—	—	i 17 53	+22	—	—
I Hyderabad		59·7	268	10 4	+ 2	18 12	0	30·5	40·1
I Bombay		63·2	273	10 22	− 5	19 2	+ 5	33·8	39·5
I Victoria	E.	63·6	48	19 10	S	(19 10)	+ 8	30·8	39·9
I Pulkovo		66·6	330	i 10 48	− 1	e 19 39	− 1	34·0	39·7
I Baku		67·8	305	10 57	0	19 58	+ 4	34·0	40·3
I Helsingfors		68·3	333	13 15	PP	e 21 0	(+ 8)	e 38·7	—
I Ukiah		68·7	56	—	—	e 20 9	+ 4	e 28·8	—
I Tiflis		70·3	308	e 11 21	+ 8	e 20 37	+12	e 38·7	46·1
II	E.	70·3	308	e 11 6	− 7	—	—	—	—
I Upsala		71·1	335	—	—	e 20 34	0	e 38·0	44·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Tinemaha	z.	73·1	56	e 11 29	0	—	—	—	—
II		73·1	56	i 11 26	− 3	—	—	—	—
I Riverview		73·6	173	—	—	e 20 51	−13	39·3	47·5
I Theodosia		73·6	316	e 11 32	0	e 21 5	+ 1	41·0	—
I Simferopol		74·3	316	e 11 30	− 6	—	—	—	—
I Adelaide		74·5	184	—	—	e 21 3	−11	e 33·5	42·8
I Mount Wilson	z.	74·9	58	e 11 38	− 2	—	—	—	—
II	z.	74·9	58	i 11 35	− 5	—	—	—	—
I Pasadena		74·9	58	e 11 40	0	—	—	e 31·0	—
II		74·9	58	i 11 35	− 5	—	—	—	—
I Riverside	z.	75·5	58	e 11 39	− 4	—	—	—	—
II	z.	75·5	58	i 11 38	− 5	—	—	—	—
I Copenhagen		76·1	335	i 11 47	0	21 18	−15	41·0	—
I Potsdam		78·6	332	e 11 51	− 9	i 21 55	− 5	e 41·0	—
I Hamburg		78·7	334	e 12 2	+ 1	—	—	40·5	50·0
I Budapest		79·9	325	e 12 3?	− 4	e 22 18	+ 3	e 43·0	52·0
I Göttingen		80·4	333	i 12 10	0	—	—	e 45·5	47·3
I Vienna		80·5	327	i 12 11k	+ 1	22 20	− 1	e 46·0	49·6
I Edinburgh		80·5	342	—	—	e 22 3?	−18	e 42·0	48·0
I Ksara		80·6	306	e 12 26	+15	22 32	+10	—	52·0
I Cheb		80·6	331	—	—	e 22 3?	−19	e 43·0	50·0
I De Bilt		81·5	336	12 16	0	22 30	− 2	e 41·0	47·7
II	z.	81·5	336	12 17	+ 1	—	—	—	—
I Stonyhurst		82·1	342	—	—	e 22 42	+ 4	42·0	—
I Zagreb		82·6	326	e 12 21	0	—	—	e 43·0	48·0
I Uccle		82·9	336	12 23	0	—	—	—	48·2
I Stuttgart		82·9	331	i 12 23a	0	e 22 45	− 1	e 42·0	47·0
I Strasbourg		83·6	332	i 12 25a	− 1	e 22 54	+ 1	e 42·0	—
I Triest		83·6	327	e 12 17	− 9	e 22 54	+ 1	—	45·0
I Oxford		83·7	339	12 43	+16	22 50	− 4	—	50·7
II Treviso		84·3	328	e 11 53	−37	(e 22 46)	[− 8]	e 22·8	—
I Zurich		84·4	332	e 12 30	0	—	—	—	—
I Paris		85·2	336	e 12 32	− 2	e 23 3?	− 7	45·0	49·0
I Piacenza		85·8	330	e 12 23	−14	23 13	− 3	—	53·4
I Florence		86·2	328	i 12 42	+ 3	i 23 3	[− 5]	41·0	48·0
I Florissant	E.	87·7	39	e 12 49	+ 3	e 23 28	− 6	—	—
I San Fernando		99·1	336	—	—	37 5	?	—	65·5

Additional readings and notes :—
Tyosi I $P_g = +1m.11s.$, II iP = +1m.4s. = P* − 3s., $P_g = +1m.23s.$, $S_g = +2m.9s.$
Toyooka I iSZ = +3m.34s., iSE = +3m.39s. = S* − 8s.
Kobe I iEN = +2m.2s., iPZ = +2m.5s., iE = +4m.8s.
Sumoto II eSZ = +4m.15s. = S* + 10s.
Sikka I and II readings have been *diminished* by 21m.
Kelzyo I PP = +3m.11s.
Zinsen I i = +3m.14s.
Zi-ka-wei I iZ = +4m.39s. = PP + 5s., +4m.58s., +8m.25s., +8m.37s., and +10m.29s.
Ekaterinburg I $L_Q = +27m.51s.$
Tashkent I e = +10m.49s., +18m.21s., +25m.21s., and +27m.45s.
Helsingfors I PPPN = +19m.28s. ; $T_0 = 9h.12m.45s.$
Adelaide I e = +26m.18s. = SS + 28s.
Copenhagen I +14m.36s. = PP + 5s.
Potsdam I iPZ = +12m.0s., ePPZ = +14m.57s., iZ = +17m.55s., iSN = +22m.0s., eZ = +22m.3s.?
Göttingen I eZ = +14m.57s. = PP − 10s., and +18m.3s.
Vienna I i = +13m.56s.
De Bilt I PPZ = +15m.23s.
Stuttgart I $eP_gPZ = +12m.40s.$, PP = +15m.33s. ; $T_0 = 9h.12m.40s.$
Strasbourg I PP? = +15m.34s.
Long waves were also recorded at I Kucino, Algiers, Ivigtut, Harvard, Pittsburgh, Wellington, Huancayo, and other European stations ; II at Hong Kong.

March 3d. 10h. These readings belong to a shock recorded as one of the principle aftershocks of the earthquake of March 2d., but do not afford a determination of epicentre. Tokyo gives 39°N. 144°E. as a rough position; the actual figures therefore are given below.

Mizusawa ePE = 4m.11s., ePN = 4m.19s., iSE = 4m.35s., eSN = 4m.42s.
Tyosi eP = 4m.11s., S = 4m.57s., SS = 4m.19s., M = 7m.28s.
Nagoya eP = 5m.46s., S = 7m.0s., M = 8m.14s.
Toyooka eP = 6m.10s., M = 9m.50s.
Osaka P = 6m.16s., S = 8m.18s., M = 10m.7s.
Kobe ePN = 6m.1s., ePZ = 6m.4s., ePE = 6m.15s., iE = 7m.10s., iN = 7m.28s., eL?N = 8m.52s., M = 9m.34s.
Sumoto P = 6m.48s., S = 8m.49s., M = 9m.38s.
Koti e = 7m.24s.
Taikyu eP = 7m.24s.
Nagasaki eP = 8m.13s., S = 10m.40s.
Keizyo P = 8m.0s., PP = 8m.6s., S = 10m.16s., M = 13m.4s.
Zinsen P = 7m.39s., e = 8m.9s., and 11m.11s.
Heizyo eSE? = 10m.7s., L = 11m.32s.
Nanking eP = 8m.42s., eL = 16m.46s.
Hong Kong M = 25m.0s.
Almata eP = 13m.46s.
Andijan eP = 13m.30s.
Ekaterinburg eP = 18m.33s., L = 34m., M = 40m.12s.
Pasadena iPZ = 15m.46s.
Mount Wilson ePZ = 15m.46s.

March 3d. 10h. 32m. 24s. Epicentre 39°·7N. 143°·0E. N.2.
(as given by the Japanese stations).

A = −·614, B = +·463, C = +·639; D = +·602, E = +·799;
G = −·510, H = +·384, K = −·769.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		1·6	249	0 24	+ 1	0 52	+11	—	—
Tyosi		4·3	203	e 0 57	− 4	1 43	− 7	—	2·3
Nagoya		6·6	228	1 36	+ 2	3 8	S*	—	3·7
Toyooka		7·7	240	i 1 49	0	—	—	—	—
Osaka		7·8	232	1 56	+ 5	3 52	S*	—	5·5
Kobe		8·0	233	e 1 43	−10	e 3 32	+ 8	—	4·8
Sumoto		8·4	232	e 2 0	+ 1	4 2	S*	—	4·7
Koti		9·7	233	—	—	e 4 36?	S*	—	—
Taikyu		12·0	256	2 48	0	—	—	—	—
Keizyo		12·6	265	3 3	+ 7	5 58	+41	7·9	—
Nagasaki		12·7	241	e 3 4	+ 6	—	—	—	—
Zinsen		13·0	265	2 47	−15	—	—	—	—
Chiufeng		20·5	280	e 4 35	0	8 13	− 3	—	13·0
Nanking		21·0	256	4 36	− 4	—	—	e 13·1	—
Andijan		52·3	296	e 9 10	+ 1	—	—	—	—
Ekaterinburg		53·7	318	i 9 22	+ 3	—	—	29·6	35·5
Mount Wilson	z.	74·9	58	i 11 38	− 2	—	—	—	—
Pasadena	z.	74·9	58	i 11 34	− 6	—	—	—	—
Riverside	z.	75·4	58	i 11 38	− 5	—	—	—	—

Additional readings:—
Mizusawa PN = +27s. = P_g +1s.
Tyosi S_g = +2m.9s.
Kobe iN = +1m.51s., iE = +2m.3s., eE = +3m.41s., iZ = +4m.37s.
Sumoto SE = +4m.8s. = S* +0s.

March 3d. 11h. 46m. 42s. Epicentre 35°·9N. 141°·1E. (as on 1932 June 22d.). X.

The Japanese stations give epicentre 35°·9N. 140°·9E.

$A = -·630$, $B = +·509$, $C = +·586$; $D = +·628$, $E = +·778$; $G = -·456$, $H = +·368$, $K = -·810$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		0·2	219	i 0 9	+ 6	0 16	+11	—	0·3
Tokyo		1·1	259	0 16	0	0 27	− 1	—	—
Mizusawa	E.	3·2	1	e 0 52	P*	i 1 31	S*	—	—
Nagoya		3·4	258	0 51	+ 2	1 39	S*	—	2·0
Osaka		4·7	256	0 59	− 8	2 6	+ 6	—	2·8
Kobe		5·0	258	1 10	− 1	2 16	+ 8	—	2·5
Toyooka		5·0	268	i 1 26	P*	i 2 28	S*	—	2·7
Sumoto		5·3	255	e 1 28	P*	i 2 31	S*	—	2·7
Koti		6·6	252	—	—	2 18?	P_g	—	—
Nanking		18·8	265	e 4 12	− 4	—	—	e 9·5	—

Additional readings:—
Mizusawa iSN = +1m.46s. = S_g +6s.
Kobe PE = +1m.19s. = P* −3s., PN = +1m.22s. = P* +0s., eSZ = +2m.29s. = S* +2s.
Toyooka iPZ = +1m.29s. = P_g −5s., eSE = +2m.39s. = S_g +0s.
Sumoto SN = +2m.34s. = S* −2s., SZ = +2m.40s. = S* +4s.

March 3d. 11h. 56m. 43s. Epicentre 38°·8N. 143°·8E. N.3.

As given by Tokyo for the shock at 18h.47m. For this shock Tokyo suggests 38°·2N. 145°·0E.

$A = -·629$, $B = +·460$, $C = +·627$; $D = +·591$, $E = +·807$; $G = -·506$, $H = +·370$, $K = -·779$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		2·1	279	0 27	− 3	i 0 51	− 3	—	—
Tyosi		3·9	217	e 0 58	+ 2	1 46	+ 6	—	2·3
Nagoya		6·6	238	1 40	+ 6	e 3 11	S*	—	3·9
Osaka		7·8	241	1 45	− 6	3 54	S*	—	4·7
Toyooka		7·9	248	i 1 59	+ 7	e 3 38	+17	—	3·7
Kobe		8·1	242	e 1 57	+ 2	3 59	S*	—	4·8
Sumoto		8·4	240	—	—	e 3 31	− 3	—	4·9
Taikyu		12·4	261	2 51	− 3	—	—	—	—
Keizyo		13·3	270	2 51	−15	5 38	+ 4	7·6	—
Chiufeng		21·3	282	e 4 34	− 9	8 26	− 6	—	12·9
Nanking		21·4	259	4 38	− 6	—	—	13·6	—
Ekaterinburg		54·9	318	i 9 22	− 6	17 0	− 8	27·3	35·4
Pulkovo		67·4	330	e 11 14	(− 9)	—	—	36·3	40·7
Tinemaha	z.	73·0	56	i 11 27	− 2	—	—	—	—
Pasadena	z.	74·8	58	i 11 36	− 3	—	—	—	—
Mount Wilson	z.	74·9	58	i 11 40	0	—	—	—	—

Additional readings:—
Kobe ePE = +2m.0s., iPZ = +2m.4s.
Sumoto eSZ = +4m.31s. = S_g +3s., eSN = +4m.40s. = S_g +9s.
Long waves were also recorded at Koti, Zinsen, Hong Kong, Tashkent, Baku, and European stations.

March 3d. 12h. 13m. 52s. Epicentre 39°·1N. 144°·7E. (as on 2d.). X.

A = −·633, B = +·448, C = +·631.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		2·8	271	i 0 41	+ 1	i 1 10	− 2	—	—
Tyosi		4·6	221	e 0 58	− 8	1 46	−12	—	—
Nagoya		7·3	240	1 44	0	3 7	+ 1	—	3·1
Toyooka		8·6	248	i 2 15	+13	—	—	—	—
Osaka		8·6	242	1 57	− 5	3 58	+19	—	5·6
Kobe		8·8	243	e 2 5	0	e 3 41	− 3	3·8	—
Sumoto		9·2	242	e 3 38	S	(e 3 38)	−16	—	—
Koti		10·6	242	—	—	e 4 8?	−20	—	—
Taikyu		13·1	261	3 2	− 1	—	—	e 9·8	—
Keizyo		13·9	269	3 14	0	6 26	+37	8·6	—
Zinsen		14·2	269	3 20	+ 2	—	—	e 7·9	—
Chiufeng		22·0	282	i 4 49a	− 2	8 37	− 9	—	14·2
Nanking		22·1	260	4 51	− 1	9 2	+14	e 13·5	—
Ekaterinburg		55·1	318	i 9 34	+ 4	i 17 47	+36	28·1	36·2
Tinemaha		72·3	56	i 11 27	+ 2	—	—	—	—
Pasadena	z.	74·1	58	i 11 35	0	—	—	—	—
Mount Wilson	z.	74·1	58	e 11 37	+ 2	—	—	—	—
Riverside	z.	74·6	58	e 11 40	+ 2	—	—	—	—

Additional readings :—
Kobe iE = +2m.34s.
Long waves were also recorded at Hong Kong.

March 3d. 15h. 2m. 17s. Epicentre 39°·7N. 143°·7E. (as on 2d.20h.). R.3.

A = −·620, B = +·455, C = +·639.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		2·1	254	i 0 31	+ 1	i 0 59	+ 5	—	—
Tyosi		4·6	210	e 1 4	− 2	1 59	+ 1	—	2·5
Nagoya		7·2	233	e 1 45	+ 3	2 59	− 5	—	4·0
Toyooka		8·2	242	i 2 4	+ 8	i 3 37	+ 8	—	—
Osaka		8·3	235	2 9	+11	4 15	S*	—	5·4
Kobe		8·5	237	e 2 14	+14	e 3 57	S*	—	4·7
Sumoto		8·8	235	2 21	+16	4 22	S*	—	4·9
Koti		10·2	236	3 43	+79	e 5 7	S*	—	—
Taikyu		12·8	257	e 2 56	− 3	—	—	—	—
Nagasaki		13·2	242	e 4 10	+65	—	—	—	—
Keizo		13·2	266	3 7	+ 2	6 1	+29	7·1	—
Zinsen		13·5	266	e 3 8	− 1	—	—	e 7·6	—
Chiufeng		21·1	280	e 4 36	− 5	e 8 26	− 2	i 10·1	13·0
Nanking		21·5	257	4 41	− 4	—	—	e 13·8	—
Almata		48·8	298	e 8 43	+ 1	—	—	—	—
Ekaterinburg		54·1	319	i 9 24	+ 2	i 16 33	−24	26·7	35·4
Tchimkent		54·2	299	e 9 9	−14	—	—	—	—
Pulkovo		66·5	330	e 10 44	− 5	e 19 49	PS	34·7	41·1
Tinemaha	z.	72·8	56	i 11 28	0	—	—	—	—
Pasadena	z.	74·4	58	i 11 39	+ 2	—	—	—	—
Riverside	z.	74·9	58	i 11 40	0	—	—	—	—
La Paz	N.	143·9	59	e 19 21	[−10]	—	—	—	—

Additional readings :—
Tyosi iP = +1m.16s. =P* +0s.
Kobe eP = +2m.17s., eE = +4m.18s. =S* +7s.
Taikyu ePP = +3m.7s.
Keizyo PP = +3m.15s.
Long waves were also recorded at Baku.

March 3d. 15h. 7m. 20s. Epicentre 39°·4N. 144°·0E. (as given by Tokyo). N.3.

A = −·625, B = +·454, C = +·635 ; D = +·588, E = +·809 :
G = −·513, H = +·373, K = −·773.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	2·3	263	0 20	−13	i 0 43	−16	—	—
Tyosi		4·4	215	e 1 5	+ 2	1 56	+ 3	—	2·4
Nagoya		7·0	236	e 1 44	+ 5	2 59	0	—	3·8
Toyooka		8·2	245	i 2 4	+ 8	3 36	+ 7	—	4·4
Osaka		8·3	238	i 2 4	+ 6	i 4 13	S*	—	5·0
Kobe		8·5	238	—	—	e 3 46	+10	—	4·9
Sumoto		8·9	239	—	—	4 10	S*	—	4·9
Koti		10·3	239	—	—	e 5 4	S*	—	—
Taikyu		12·7	259	e 2 53	− 5	e 5 25	+ 5	e 6·2	—
Nagasaki		13·2	244	e 3 38	+33	6 34	+62	—	—
Keizyo		13·4	268	3 5	− 2	5 44	+ 7	6·8	—
Zinsen		13·7	268	e 2 54	−17	—	—	e 6·7	—
Nanking		21·7	258	e 4 40	− 8	—	—	—	—
Phu-Lien		37·0	249	6 40?	−26	—	—	—	—
Andijan		53·2	296	e 13 8	?	e 18 15	?	—	—
Ekaterinburg		54·5	318	i 9 24	− 1	—	—	28·7	35·5
Tashkent		55·1	298	e 9 27	− 3	—	—	e 24·0	34·1
Tinemaha		72·6	56	i 11 26	0	—	—	—	—
Pasadena	Z.	74·4	58	i 11 37	0	—	—	—	—
Mount Wilson	Z.	74·4	58	i 11 38	+ 1	—	—	—	—
Riverside	Z.	75·0	58	i 11 38	− 2	—	—	—	—
Karlsruhe		83·2	333	23 60	S	(23 6)	+17	—	—
Triest		84·0	328	e 13 48	+80	e 24 32	?	—	42·7
Florence		86·5	328	e 12 10	−31	—	—	—	32·7

Additional readings :—
Mizusawa iSN = +46s.
Tyosi S_g = +2m.7s. = S* − 2s.
Taikyu ePP = +3m.5s.
Long waves were also recorded at Hong Kong, Bombay, and other European stations.

March 3d. 15h. 50m. 58s. Epicentre 39°·0N. 143°·5E. (as at 4h.). X.

Tokyo gives a near position 39°·0N. 143°·7E.

A = −·625, B = +·462, C = +·629 ; D = +·595, E = +·804 ;
G = −·506, H = +·374, K = −·777.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	1·8	274	−0 7	−33	0 23	−23	—	—
	N.	1·8	274	0 16	−10	0 42	− 4	—	—
Tyosi		3·9	213	e 0 56	0	1 54	S*	—	2·4
Nagoya		6·5	236	e 1 39	+ 7	3 1	+15	—	—
Osaka		7·8	238	2 5	P*	4 1	S_g	—	5·3
Kobe	E.	8·0	240	—	—	e 3 25	+ 1	e 4·3	5·2
Sumoto		8·3	239	—	—	e 3 48	+17	—	4·5
Koti		9·7	239	e 2 2?	−15	—	—	—	—
Taikyu		12·2	260	e 2 17	−34	—	—	—	—
Keizyo		13·0	269	3 13	+11	—	—	7·8	—
Chiufeng		21·1	282	e 4 33	− 8	—	—	—	13·3
Nanking		21·2	259	e 4 39	− 3	—	—	—	—
Ekaterinburg		54·5	318	e 9 29	+ 4	—	—	28·0	35·3

Additional readings :—
Tyosi S_g = +2m.16s.
Long waves were also recorded at Zinsen, Hong Kong, Phu-Lien, Tashkent, Pulkovo, Copenhagen, De Bilt, and Triest.

March 3d. 16h. 11m. 46s. Epicentre 39°·1N. 145°·2E. R.2.
(given by Tokyo and as at 0h.).

A = −·637, B = +·443, C = +·631 ; D = +·571, E = +·821 ;
G = −·518, H = +·360, K = −·776.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	3·1	271	0 43	− 1	1 18	− 2	—	—
	N.	3·1	271	i 0 46	+ 2	i 1 14	− 6	—	—
Tyosi		4·8	227	i 1 10	+ 2	i 2 4	+ 1	—	2·2
Nagoya		7·6	242	e 2 0	P*	3 18	+ 4	—	—
Osaka		8·9	243	2 8	+ 2	4 18	S*	—	4·7
Kobe		9·2	244	—	—	e 3 28	−26	—	5·6
Sumoto		9·5	243	e 2 27	+13	4 38	S*	—	5·5
Sikka		10·2	352	(2 37)	+13	—	—	—	—
Koti		10·9	243	—	—	4 14?	−22	—	—
Taikyu		13·5	261	e 3 5	− 4	—	—	—	—
Keizyo		14·3	270	3 19	0	6 19	+21	7·4	—
Zinsen		14·6	269	3 21	− 2	—	—	e 7·2	—
Chiufeng		22·3	282	e 4 49	− 5	8 43	− 9	—	13·9
Nanking		22·5	260	4 53	− 3	e 8 56	+ 1	—	—
Almata		50·1	298	e 16 14	S	(e 16 14)	+12	—	—
Andijan		54·1	296	e 18 26	?	—	—	—	—
Ekaterinburg		55·3	318	i 9 28	− 3	17 9	− 4	27·2	37·1
Tchimkent		55·4	299	e 17 26	S	(e 17 26)	+11	—	—
Tashkent		56·1	298	—	—	e 17 50	+26	e 29·1	35·4
Tinemaha	Z.	72·0	57	i 11 23	0	—	—	—	—
Pasadena	Z.	73·8	59	i 11 32	− 1	—	—	—	—
Mount Wilson	Z.	73·8	59	e 11 33	0	—	—	—	—
Karlsruhe		83·9	333	22 14?	S	(22 14?)	−42	—	—

Additional readings and note :—
Kobe eE = +4m.13s.
Sumoto eN = +2m.41s.
Sikka reading has been *diminished* by 21m. ; see note to 9h. shock.
Long waves were also recorded at Hong Kong, Bombay, Kucino, Pulkovo, Copenhagen, De Bilt, Florence, and San Fernando.

March 3d. 18h. 47m. 23s. Epicentre 38°·8N. 143°·8E. R.3.
(given by Tokyo and as at 11h.56m.).

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	2·1	279	i 0 32	+ 2	i 1 12	+18	—	—
	N.	2·1	279	e 0 34	+ 4	e 1 7	+13	—	—
Tyosi		3·9	217	e 1 5	P*	2 6	S_g	—	—
Nagoya		6·6	238	e 1 54	P*	3 18	S*	—	—
Osaka		7·8	241	2 12	P*	4 10	S_g	—	4·9
Sumoto	N.	8·4	240	—	—	e 3 25	− 9	—	5·6
Taikyu		12·4	261	e 2 55	+ 1	—	—	—	—
Chiufeng		21·3	282	e 4 39	− 4	e 8 26	− 6	—	13·4
Nanking		21·4	259	e 4 50	+ 6	e 8 11	−23	—	—
Ekaterinburg		54·9	318	e 9 29	+ 1	e 17 12	+ 4	27·6	35·5

Sumoto eE = +3m.29s., SEN = +4m.18s. =S* +10s.
Long waves were also recorded at Koti, Kobe, Hong Kong, Baku, Tashkent, Florence, Taranto, Trenta, Triest, Strasbourg, and Potsdam.

March 3d. 19h. 7m. 26s. Epicentre 39°·0N. 144°·4E. (as given by Tokyo). N.3.

A = −·632, B = +·452, C = +·629; D = +·582, E = +·813;
G = −·512, H = +·366, K = −·777.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	2·6	273	i 0 34	− 3	i 1 2	− 5	—	—
Tyosi	4·3	221	e 1 9	P*	1 56	+ 6	—	2·5
Nagoya	7·1	240	1 46	+ 5	3 16	+15	—	3·5
Osaka	8·3	241	2 7	+ 9	4 12	S*	—	5·0
Toyooka	8·4	248	i 1 59	0	i 3 44	+10	—	5·0
Kobe	8·6	243	e 2 19	+17	e 4 2	S*	—	4·8
Sumoto	8·9	241	e 2 27	+21	4 12	S*	—	5·0
Koti	10·3	242	3 34?	+69	4 58	S*	—	—
Taikyu	12·9	261	e 2 59	− 2	e 5 36	+11	e 6·6	—
Nagasaki	13·3	246	e 3 47	+41	e 6 48	+74	—	—
Keizyo	13·7	269	3 7	− 4	5 46	+ 2	7·7	—
Zinsen	14·1	268	2 53	−24	—	—	e 6·8	—
Chiufeng	21·8	282	4 41a	− 8	8 35	− 7	e 11·2	13·0
Nanking	21·9	259	e 4 45	− 5	e 8 48	+ 4	—	15·4
Ekaterinburg	54·3	318	i 9 29	+ 6	—	—	35·0	36·5
Tashkent	55·6	298	—	—	e 17 21	+ 4	e 28·6	34·1
Pulkovo	67·4	330	e 8 46	?	—	—	35·6	41·3
Copenhagen	76·9	335	19 4	?	—	—	40·6	—
Stuttgart	83·4	332	—	—	e 33 58	?	e 46·1	—

Additional readings:—
Tyosi S_g = +2m.0s. = S* − 6s.
Nagoya P_g = +1m.57s. = P* − 1s.
Kobe ePN = +2m.27s.
Sumoto SN = +4m.20s.
Ekaterinburg i = +9m.46s. and +11m.39s. = PP + 20s., L_q = +27·6m.
Pulkovo i = +11m.17s. = P_cP − 6s., e = +16m.54s.
Stuttgart e = +35m.34s.
Long waves were also recorded at Hong Kong, Phu-Lien, Bombay, Baku, and the European stations.

March 3d. 19h. 50m. 39s. (I) } Epicentre 39°·3N. 143°·5E. N.3.
20h. 20m. 31s. (II) } (given by Tokyo). X.

A = −·622, B = +·460, C = +·633; D = +·595, E = +·804;
G = −·509, H = +·377, K = −·774.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Mizusawa	1·9	265	i 0 25	− 3	i 0 53	S*	—	—
II	1·9	265	i 0 25	− 3	0 54	S*	—	—
I Tyosi	4·1	211	e 1 7	P*	1 52	+ 7	—	—
II	4·1	211	e 1 0	+ 2	1 51	+ 6	—	2·2
I Nagoya	6·6	234	e 1 41	+ 7	3 9	S*	—	—
II	6·6	234	e 1 47	P*	3 20	S*	—	—
I Osaka	7·9	237	1 50	− 2	3 47	S*	—	4·1
II	7·9	237	2 4	P*	4 2	S*	—	4·6
I Sumoto	8·5	237	e 4 8	S*	—	—	—	—
II	8·5	237	e 3 36	S	(e 3 36)	0	—	—
I Taikyu	12·3	258	e 2 54	+ 2	—	—	—	—
II	12·3	258	e 2 47	− 5	—	—	—	—
I Chiufeng	21·0	281	e 4 35	− 5	—	—	—	12·8
II	21·0	281	e 4 34	− 6	e 8 31	+ 5	—	13·2
I Nanking	21·3	258	e 4 38	− 5	—	—	—	—
II	21·3	258	e 4 38	− 5	—	—	—	—
I Ekaterinburg	54·3	318	e 9 23	0	—	—	27·4	36·2
II	54·3	318	i 9 21	− 2	—	—	27·5	37·4

Additional readings and notes:—
Mizusawa I iSE = +56s. = S_g − 1s., II SE = +1m.2s.
Tyosi I S_gE = +2m.8s. = S_g − 1s., S_gN = +2m.18s., II S_g = +2m.5s. = S_g − 4s.
Long waves were also recorded for Shock I at Kobe, Koti, and Tashkent, and for Shock II at Kobe, Koti, Hong Kong, Tashkent, Pulkovo, Copenhagen, and San Fernando.

March 3d. After-shocks from the neighbourhood of the great Sauriku earthquake of March 2d. were recorded at Japanese stations as follows. The list does not include those readings which belong to shocks already worked out in detail.

Mizusawa.

	P.			S.			P.			S.	
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 0	3	28	10	30	22?	10	30	48?
e 0	11	15	i 0	11	45	e 10	46	26	e 10	46	56
e 0	25	1	e 0	25	27	e 10	57	25	i 10	58	5
e 0	26	36	e 0	26	50	e 11	2	57	e 11	3	26
0	28	8	i 0	28	31	e 11	24	27	i 11	24	53
			e 0	39	41	e 11	38	12	e 11	38	39
i 0	43	57	i 0	44	23	e 11	52	0	i 11	52	23?
i 0	55	4	i 0	55	29	12	21	26?	12	21	49?
			1	5	36				12	31	38?
e 1	19	58	e 1	20	30	12	32	57?	12	33	27?
e 1	47	40	e 1	48	1	e 12	43	31	e 12	43	58
e 2	21	49	e 2	22	11	e 12	56	31	e 12	57	5
e 2	28	2	e 2	28	29	e 13	2	11	e 13	2	38
			e 2	49	20				e 13	13	40
e 2	51	6	e 2	51	20	e 13	16	39	e 13	17	5
			i 2	58	23				e 13	55	51
			e 2	59	54	e 14	14	15	e 14	14	46
i 3	15	21	e 3	15	41				e 14	20	44
e 3	30	34	e 3	30	50				e 14	27	35
i 3	34	36	i 3	35	19	e 14	56	37	e 14	57	13
e 3	43	40	i 3	44	6				15	18	6?
e 3	51	52	e 3	52	12	15	27	4?	15	27	50?
			e 4	10	10	15	45	15?	15	45	49?
e 4	32	37	i 4	33	9	15	58	17?	15	58	50?
i 4	50	36	e 4	50	55	e 16	32	20	i 16	32	48
			e 4	55	37	e 16	42	21	i 16	42	50
			e 4	59	4	i 17	1	39	17	2	3
e 5	2	41	i 5	3	14				e 17	13	30
e 5	11	42	i 5	12	9	e 17	16	7	e 17	16	32
e 5	19	15	e 5	19	35	e 17	22	4	e 17	22	42
			e 5	46	13				e 17	26	58
			e 6	9	51	e 17	50	19	17	50	56
e 6	12	20	i 6	12	46	e 18	1	18	e 18	1	22
			e 6	17	22	e 18	31	33	e 18	31	58
e 6	35	34	e 6	36	7				e 18	57	54
e 6	59	56	i 7	0	23	e 19	32	18	e 19	32	49
			e 7	13	34	i 20	11	14	i 20	11	41
e 7	19	33	i 7	20	7	e 20	41	48	i 20	42	13
e 7	39	43	i 7	40	10				e 21	12	35
e 7	52	29	i 7	52	59				e 21	26	12
i 8	15	18	i 8	15	44	e 21	54	55	i 21	55	32
e 8	21	38	e 8	22	3	e 22	19	36	e 22	20	5
e 8	26	6	e 8	26	33	i 22	31	35	e 22	31	57
			e 8	44	46				e 22	46	1
e 8	47	20	e 8	47	48	e 22	49	9	e 22	49	37
			i 8	57	24	e 22	54	0	e 22	54	27
e 9	26	26	i 9	26	49	e 23	4	25	e 23	5	3
i 9	29	10	e 9	29	34	i 23	11	28	i 23	11	47
e 9	53	4	i 9	53	45	i 23	18	50	i 23	19	17
e 10	22	34?	10	23	0?	i 23	45	42	23	46	14
			10	28	12?				e 23	53	44

Tyosi.

	P.			S.			P.			S.	
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 0	3	47	0	4	34	e 8	15	51	8	16	43
			i 0	25	42	e 8	26	39	8	27	37
e 0	26	48	0	27	33				9	28	15
e 0	29	17	0	30	0	e 9	30	12	9	31	5
e 0	32	51				e 9	39	19			
e 0	45	19	0	46	4	e 9	53	48			
			3	33	35				11	53	5
e 3	34	55	e 3	35	51	e 12	21	48	12	22	33
e 3	52	17	3	53	4	e 20	12	34			
			4	10	52	e 22	32	7	23	47	10
e 4	45	20									

Nagoya.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 0	4	50	e 0	6	8	e 9	54	41	9	56	12
e 0	27	39	0	28	59	e 12	22	51	12	23	57
			e 0	31	17	e 21	56	42	e 21	57	59
e 0	45	24	e 0	46	50	e 22	32	44	22	34	15
e 3	35	45	e 3	36	55	e 23	13	13	23	14	19
e 4	33	49	e 4	34	49	e 23	19	55	e 23	21	23
e 8	16	44	e 8	18	5	e 23	47	43	e 23	48	44

Osaka.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	28	2	0	30	2	12	22	50	12	24	51

Sumoto.

P.		
h.	m.	s.
e 12	24	45

March 3d. Readings also at 0h. (Mount Wilson, Pasadena, Riverside, and Tinemaha), 1h. (Ekaterinburg, Tashkent, Strasbourg, Keizyo, near Husan, Nagasaki, Taikyu, and Zinsen), 2h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Paris, and near Osaka (4)), 4h. (Mount Wilson (2), Pasadena (2), Riverside (2), and Tinemaha), 5h. (Zinsen), 6h. (Andijan, Almata, Tashkent, Chiufeng, Ekaterinburg, Tiflis, and near Balboa Heights), 7h. (Belgrade), 8h. (near Balboa Heights), 9h. (Mount Wilson, Pasadena, Riverside, Tinemaha, La Jolla, Haiwee, Sucre, and near La Paz (2)), 10h. (Mount Wilson, Pasadena, Riverside, Tinemaha), 12h. (Mount Wilson, Pasadena, Riverside, Andijan, Wellington, and near Glenmuick), 14h. (Branner, near Osaka, and Sumoto), 15h. (Branner, Sucre, Montezuma, and La Paz), 16h. (near Calcutta), 17h. (near Tyosi), 19h. (near Athens), 20h. (near Santiago), 21h. (Huancayo), 22h. (Ekaterinburg), 23h. (near Nagoya).

March 4d. 6h. 44m. 21s. (I)
6h. 45m. 5s. (II)
12h. 40m. 10s. (III)
20h. 27m. 40s. (IV)
} Epicentre 39°·1N. 144°·7E. (as on 3d.) X. X. X. X.

A = −·633, B = +·448, C = +·631.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Mizusawa	2·8	271	i 0 41	+ 1	e 1 10	− 2	—	—
III		2·8	271	i 0 43	+ 3	i 1 12	0	—	—
IV		2·8	271	0 43	+ 3	e 1 9	− 3	—	—
II	Tyosi	4·6	221	e 1 8	+ 2	2 1	+ 3	—	—
III		4·6	221	i 1 6	0	i 1 56	− 2	—	2·1
IV		4·6	221	e 1 3	− 3	1 57	− 1	—	—
II	Nagoya	7·3	240	1 37	− 7	3 8	+ 2	—	—
III		7·3	240	1 44	0	3 11	+ 5	—	—
IV		7·3	240	e 1 48	+ 4	e 3 12	+ 6	—	—
I	Osaka	8·6	242	2 16	+14	—	—	—	—
II		8·6	242	—	—	3 33	− 6	—	4·7
III		8·6	242	1 29	−33	3 36	− 3	—	4·0
I	Kobe	8·8	243	e 2 29	+24	e 4 2	+16	—	4·5
I	Sumoto N.	9·2	242	e 3 46	S	(e 3 46)	− 8	—	—
I	Chiufeng	22·0	282	e 4 41	−10	e 8 45	− 1	—	13·3
IV		22·0	282	—	—	e 8 47	+ 1	—	—
I	Nanking	22·1	260	e 3 48	−64	—	—	—	—
IV		22·1	260	e 4 51	− 1	—	—	—	—
I	Ekaterinburg	55·1	318	i 9 24	− 6	—	—	28·6	35·6
II		55·1	318	—	—	i 17 17	+ 6	—	—
III		55·1	318	i 9 29	− 1	i 21 42	?	28·8	—
IV		55·1	318	9 28	− 2	—	—	28·8	—

Additional readings :—
Mizusawa I iSE = +1m.14s. IV iSE = +1m.12s.
Nagoya III P_g = +1m.58s. = P* −4s.
Sumoto I ePE = +3m.54s.
Long waves were also recorded for Shock I at Hong Kong, Baku, Tashkent, Pulkovo, Kucino, Copenhagen, and Stuttgart, and for Shock III at Baku and Tashkent.

March 4d. Local shocks apparently connected with the great shock of 2d. were recorded by Japanese stations as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 0	0	14	e 0	0	38				e 10	2	24
e 0	1	43	e 0	2	12	i 10	19	13	e 10	19	36
e 0	18	34	e 0	19	2	i 10	45	59	i 10	46	24
i 0	23	52	e 0	24	18				e 10	56	36
e 0	47	54	e 0	48	37				e 11	30	8
e 0	59	21	e 0	59	52	e 11	51	26	e 11	51	53
			e 1	56	14	e 12	13	50	e 12	14	26
e 2	2	13	e 2	2	40	e 12	19	50	e 12	20	24
e 2	21	46	e 2	22	18	e 13	49	23	e 13	49	50
e 2	25	33	e 2	25	59				e 14	7	0
e 2	36	2	e 2	36	44				e 14	9	18
			e 3	17	15				e 14	20	30
e 3	32	28	i 3	33	6				e 14	46	17
e 3	48	45	i 3	49	15	i 15	29	54	e 15	30	20
e 3	52	6	e 3	52	34				e 15	48	20
			e 4	39	25	e 17	17	28	e 17	17	50
e 4	41	47	e 4	42	27	e 17	26	54	i 17	27	39
e 5	4	38	e 5	5	7	e 17	58	5	e 17	58	33
e 5	22	2	e 5	22	29	e 18	11	26	e 18	12	0
e 5	54	5	e 5	54	32				e 18	29	46
e 6	3	10	e 6	3	40	e 19	44	31	e 19	45	6
			e 6	56	55	e 19	56	59	e 19	57	30
e 7	5	39	e 7	6	0				e 20	20	27
			e 7	14	18				e 20	53	40
e 8	9	39	e 8	10	16				e 22	3	14
i 8	22	36	i 8	23	1	i 22	14	33	i 22	15	2
			e 8	49	37	e 22	44	45	e 22	45	38
			e 9	44	41				e 23	8	13

Tyosi.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 8	22	50	8	23	39				i 15	31	24
			e 10	20	18	e 16	5	45			
i 13	54	57	13	55	3				22	15	34

Nagoya

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 0	25	4	e 0	25	57	e 10	47	39	e 10	48	47
e 7	8	6	e 7	9	5	e 17	29	55			
e 8	23	40	8	24	53	e 22	16	7	e 22	17	11
e 10	20	27	e 10	21	49						

March 4d. Readings also at 7h. (Koti), 8h. (Chiufeng and Wellington), 9h. (Wellington), 10h. (Takaka and near Wellington), 11h. (Takaka and near Wellington), 12h. (Athens and New Plymouth), 14h. (Athens, Hohenheim, Stuttgart, La Paz, Montezuma, and Sucre), 15h. (Branner, Hohenheim, Stuttgart, near Chur, Neuchatel, Zurich, and near La Paz), 16h. (Wellington and Nanking), 18h. (Almata, Andijan, Tchimkent, Tashkent, Chiufeng, Tiflis, Baku, and Ekaterinburg), 21h. (Baku, Ekaterinburg, Tiflis, Kucino, Pulkovo, Florence, Triest, Strasbourg, Taranto, Trenta, Stuttgart, near Athens, and near Santiago), 22h. (Baku, Ekaterinburg, and Chiufeng).

March 5d. 8h. 19m. 54s. Epicentre 2°·0S. 128°·5E. (as on 1925 June 9d.). R.2.

$A = -\cdot622$, $B = +\cdot782$, $C = -\cdot035$; $D = +\cdot783$, $E = +\cdot622$; $G = +\cdot022$, $H = -\cdot027$, $K = -\cdot999$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	1·7	188	i 0 39	+15	1 10	+26	—	—
Manila	18·2	336	i 4 7a	− 2	7 23	− 6	—	10·8
Malabar	21·5	255	i 4 53	+ 8	i 9 48	+72	—	—
Batavia	22·0	258	4 49k	− 2	10 7	L	(10·1)	—
Hong Kong	28·1	331	5 45	− 3	8 42	−112	—	11·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Medan		30·3	281	6 32	+24	12 0	+51	—	—
Phu-Lien		31·3	319	6 6?	−11	—	—	—	—
Perth		32·2	200	10 6	S	(10 6)	−92	—	23·1
Adelaide		34·3	166	—	—	e 12 6	− 5	i 17·4	20·9
Nanking		35·3	346	e 6 48	− 4	(12 34)	+ 8	12·6	—
Nagoya		38·0	12	e 6 48	−27	—	—	—	—
Riverview		38·2	148	—	—	e 16 6	?	23·8	25·8
Sydney		38·2	148	e 12 24	S	(e 12 24)	−45	25·7	26·8
Melbourne		38·8	159	—	—	e 13 21	+ 3	26·1?	27·4
Chiufeng		43·6	347	7 57k	− 5	—	—	—	—
Calcutta		46·2	305	6 20	−122	10 20	PP	13·1	—
Hyderabad		53·0	294	9 12	− 2	12 23	PPP	14·2	20·7
Bombay		58·5	294	e 10 6	+12	—	—	—	—
Almata		64·6	322	e 10 46	+10	—	—	—	—
Andijan		66·4	317	e 10 48	0	19 38	+ 1	—	—
Tashkent		68·8	317	e 11 24	(− 4)	e 20 6?	− 1	—	39·4
Tchimkent		69·0	318	e 10 55	−10	e 20 4	− 5	—	—
Ekaterinburg		79·8	330	i 12 4	− 3	—	—	32·1	—
Baku		82·7	311	e 12 21	− 1	—	—	33·1	—
Tiflis	E.	86·7	312	e 12 40	− 2	e 23 8	[− 3]	e 44·1	—
Ksara		93·3	303	e 13 32?	+19	e 24 55?	+28	—	—
Pulkovo		95·9	330	—	—	e 23 52	[−13]	48·1	—

Additional readings :—
Amboina i = +46s.
Batavia PZ = +4m.54s.
Adelaide e = +13m.32s.
Sydney eS = +19m.24s.
Melbourne i = +20m.35s. and +22m.38s.
Chiufeng i = +9m.40s. =PP +3s.
Tashkent e = +24m.24s. =SS +0s. and +31m.24s.
Ekaterinburg i = +13m.11s., iPP = +15m.12s., iPPP = +16m.59s., iPS = +23m.2s., i = +23m.20s., SS = +27m.54s.
Tiflis ePSE = +24m.1s., eSSE = +28m.41s., eSSSE = +33m.16s.
Ksara ePP = +17m.21s. ?
Long waves were also recorded at Huancayo, Kucino, and European stations.

March 5d. Local shocks connected with the great shock of 2d. were recorded by Japanese stations as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
i 1	26	5	i 1	26	27	e 16	23	26	e 16	23	59
			e 3	9	52	e 16	28	21	e 16	28	51
e 4	3	9	e 4	3	33				e 17	12	27
e 5	37	45	i 5	38	15				e 17	27	36
e 5	48	51	i 5	49	9	e 17	42	55	e 17	43	29
e 6	38	50	i 6	39	8				e 17	52	38
e 7	1	25	e 7	1	56				e 18	7	19
			e 7	48	11				e 19	28	12
			e 10	39	29	e 19	44	19	i 19	44	45
			e 11	22	6				e 20	45	58
			e 11	53	54	e 20	47	44	i 20	48	6
			e 11	58	59				e 20	55	58
			e 12	15	41				e 21	36	15
e 13	17	53	i 13	18	14				e 22	9	40
e 14	52	24	e 14	52	42				e 22	58	19

Tyosi.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 1	27	19	1	28	4	e 20	48	8	20	49	6

Nagoya.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
1	27	38	1	28	55	e 20	48	57	20	50	9

March 5d. Readings also at 0h. (near Manila), 1h. (Chiufeng, Ekaterinburg, Tiflis, and La Paz), 2h. (Baku), 5h. (Uccle), 6h. (La Plata), 7h. (La Paz and near Amboina (2)), 11h. (Berkeley, Branner, Lick, San Francisco, and Tortosa), 14h. (near Amboina), 18h. (Suva), 19h. (Ekaterinburg, Baku, Strasbourg, and near Amboina), 20h. (Chiufeng), 21h. (Baku, Ekaterinburg, Tashkent, Tiflis, and Messina), 22h. (Berkeley, near Branner, and Lick).

March 6d. 1h. 56m. 55s. Epicentre 48°·3N. 9°·0E. (as at 1d. 2h.). X.

A = +·657, B = +·104, C = +·747.

	Δ	P.	O−C.	S.	O−C.
	°	m. s.	s.	m. s.	s.
Stuttgart	0·4	—	—	e 0 10	0
Hohenheim	0·5	e 0 5	− 2	e 0 10	− 3
Zurich	1·0	e 0 14	0	e 0 27	+ 1
Chur	1·5	—	—	e 0 41	+ 2
Neuchatel	1·9	e 0 30	+ 2	e 0 53	+ 4

Stuttgart e = +16s.

March 6d. 13h. 5m. 38s. Epicentre 25°·7N. 90°·5E. N.2.

A = −·008, B = +·901, C = +·434 ; D = +1·000, E = +·009 ;
G = −·004, H = +·434, K = −·901.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta		3·7	211	0 6	−47	0 52	−43	1·2	1·5
Agra	N.	11·3	280	e 2 25	−14	4 24	−21	5·6	—
Dehra Dun		11·9	296	2 42	− 5	4 42	−18	6·4	7·4
Hyderabad		13·9	236	3 11	− 3	5 37	−12	—	10·3
Phu-Lien		15·6	105	3 22?	−14	—	—	—	—
Bombay		17·7	251	4 4	+ 1	7 16	− 1	8·9	9·5
Almata		20·8	332	4 40	+ 2	8 27	+ 5	—	—
Andijan		21·2	320	4 43	+ 1	8 36	+ 6	—	—
Hong Kong		21·8	94	4 47	− 2	8 50	+ 8	—	14·1
Medan		23·4	159	5 21	+16	9 28	+16	—	—
Tashkent		23·4	317	i 5 5	0	i 9 12	0	—	—
Tchimkent		23·9	319	5 13	+ 4	—	—	—	—
Samarkand		24·0	311	5 11	+ 1	—	—	—	—
Nanking		25·4	69	5 23	− 1	10 6	+18	14·0	—
Chiufeng		25·7	50	5 25	− 1	i 10 2	+ 9	i 13·0	16·1
Manila		30·5	105	6 13k	+ 4	11 30	+18	—	19·4
Ekaterinburg		37·7	334	i 7 11	− 1	i 12 57	− 5	23·7	—
Kobe		39·3	66	e 7 24	− 2	—	—	—	—
Tiflis		40·7	305	7 37	− 1	e 13 46	− 1	24·4	33·0
Nagoya		40·8	65	e 7 49	+10	—	—	—	—
Ksara		47·5	292	e 8 36	+ 4	e 15 30	+ 4	—	—
Helwan		51·9	288	e 9 4	− 2	e 16 25	− 2	—	35·8
Pulkovo		53·1	327	9 12	− 3	e 16 36	− 7	24·4	33·2
Vienna	Z.	60·8	313	i 10 5k	− 5	—	—	—	—
Potsdam		62·4	318	e 10 20	− 1	—	—	e 30·4	39·4
La Paz	N.	158·1	291	e 19 58	[+ 7]	—	—	—	—

Additional readings :—
Agra PE = +2m.33s.
Medan i = +5m.26s. =PP − 3s., SN = +9m.44s. =SS − 6s.
Nanking iN = +12m.39s.
Chiufeng i = +5m.37s. and +10m.29s.
Tiflis eEN = +7m.46s., ePPEN = +9m.10s., eSSE = +16m.56s., eE = +21m.18s
Long waves were also recorded at other European stations.

March 6d. 22h. 45m. 2s. Epicentre 34°·2N. 135°·2E. (as on 1930 Oct. 29d.). X.

A = −·587, B = +·583, C = +·562 ; D = +·705, E = +·710 ;
G = −·399, H = +·396, K = −·827.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sumoto	0·3	300	−i 0 1k	− 5	i 0 2	− 6	—	0·1
Kobe	0·5	358	0 5	− 2	i 0 13	0	—	0·3
Osaka	0·6	32	0 5	− 4	0 15	0	—	0·9
Toyooka	1·4	347	i 0 21a	+ 1	i 0 41	+ 5	—	0·7
Koti	1·5	245	0 22	+ 1	0 41	+ 2	0·8	—
Nagoya	1·7	56	0 28	+ 4	0 54	S_g	—	1·0
Hukuoka	4·0	262	1 7	P*	2 0	S*	—	—
Nagasaki	4·7	254	e 1 21	P*	2 11	S*	—	—
Nanking	13·9	265	4 47	+93	6 18	+29	i 7·1	—

Osaka gives also i = +9s. = P_g − 2s. and +37s.
Long waves were also recorded at Chiufeng.

March 6d. Local shocks connected with the shock of 2d. were recorded at Japanese stations as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 1	49	53				e 10	42	7
			e 3	1	29	e 11	31	19	e 11	31	45
e 3	10	23	e 3	11	17				e 11	51	16
e 4	3	2	4	3	35				e 13	10	20
			e 5	0	11				e 13	13	45
e 5	36	32	e 5	36	58				e 15	55	49
e 6	12	53	6	13	21	e 16	19	47	e 16	20	20
			e 6	18	0	e 17	7	8	e 17	7	41
e 6	57	57	e 6	58	27	e 17	23	14	e 17	23	40
i 7	53	27	i 7	53	56	e 17	41	30	e 17	41	55
			e 8	10	10				e 19	19	20
e 8	22	31	e 8	23	4	e 21	15	4	i 21	15	40
e 8	27	37	e 8	28	5	e 21	30	28	e 21	30	55
			e 8	38	58	e 22	2	0	e 22	2	29
i 8	57	58	i 8	58	25				e 23	4	43
e 9	10	30	e 9	10	51	e 23	18	44	e 23	19	14

Tyosi.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			i 3	0	32	i 7	53	54	7	54	35
			i 4	3	26	e 8	58	15	8	58	57
i 5	0	13									

Nagoya.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 7	54	36	e 7	55	34	e 8	59	43	e 9	0	34

March 6d. Readings also at 0h. (near Manila and near Santiago (2)), 1h. (Reykjavik), 2h. (Mount Wilson, Pasadena, and Tinemaha), 3h. (near Tiflis), 4h. (near Tananarive), 6h. (near Santiago), 7h. (Alicante), 15h. (Andijan), 17h. (Kobe and near Sumoto), 18h. (near La Paz), 20h. (near Tiflis), 22h. (near Sumoto and near Taihoku).

March 7d. 14h. 40m. 16s. Epicentre 41°·1N. 15°·4E. (as on 1930 Sept. 5d.). R.2.

A = +·726, B = +·200, C = +·657 ; D = +·266, E = −·964 ;
G = +·634, H = +·175, K = −·754.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Benevento		0·8	272	i − 0 30	−41	—	—	—	−0·4
Naples	N.	0·9	253	i 0 8	− 5	e 0 18	− 5	4·4	—
Bari		1·1	88	0 9	− 7	—	—	—	—
Taranto		1·6	114	0 22	− 1	—	—	—	—
Trenta		2·0	159	i 0 29	0	e 0 54	+ 3	—	—
Rome		2·3	290	0 35	+ 2	1 18	S_g	—	2·1
Camerino		2·7	322	0 44	+ 5	—	—	—	—
Messina		2·9	178	0 41	0	1 21	S*	—	—
Catania		3·6	184	1 45	+54	2 21	+49	2·5	2·9
Siena		3·7	308	1 14	+21	2 14	+39	—	—
Florence		4·1	313	0 56	− 2	2 2	S*	—	2·7
Prato		4·2	313	e 1 7	P*	i 2 5	S*	—	2·4
Triest		4·7	346	1 7	0	i 2 2	+ 2	—	3·1
Zagreb		4·7	5	e 1 5	− 2	i 2 30	S_g	—	2·7
Venice		4·9	333	0 54	−16	3 3	?	3·8	4·2
Padova		5·0	331	1 6	− 5	2 31	S_g	—	—
Laibach		5·0	353	e 1 30	P_g	e 2 5	− 3	—	2·9
Treviso		5·1	333	e 1 12	− 1	3 10	+60	—	—
Belgrade		5·2	43	e 1 39	P_g	e 2 54	S_g	—	4·6
Piacenza		5·7	316	e 1 44	P_g	2 41	S*	3·3	4·4
Budapest		6·9	21	e 2 21	P_g	3 48	S_g	4·7	—
Athens		7·1	113	1 41	0	2 59	− 2	3·4	5·1
Vienna		7·2	6	2 3	P*	3 5	+ 1	—	4·3
Chur		7·2	325	e 1 39	− 3	e 2 53	−11	—	—
Zurich		7·9	324	e 1 47	− 5	—	—	—	—
Ravensburg		7·9	330	e 1 50	− 2	—	—	e 4·5	—
Neuchatel		8·4	316	e 1 55	− 4	—	—	—	—
Stuttgart		8·8	332	e 2 14	+ 9	e 3 55	+11	e 5·4	6·7
Prague		9·0	356	e 2 48	+41	e 3 58	+ 9	—	4·7
Strasbourg		9·2	327	2 53	?	e 4 1	+ 7	e 5·7	—
Cheb		9·2	348	—	—	e 3 44?	−10	—	5·4
Göttingen		11·1	342	—	—	e 4 44	+ 3	—	6·5
Potsdam		11·4	353	—	—	e 5 14	S*	—	6·7
Ksara		17·8	107	e 4 12	+ 8	—	—	—	—
Pulkovo		20·8	22	4 35	− 3	—	—	10·7	11·0
Tiflis	E.	21·9	79	4 54	+ 4	9 1	+17	e 14·7	—
Baku		26·0	80	—	—	e 11 44	SSS	e 15·7	—
Ekaterinburg		32·8	45	e 6 33	+ 3	e 13 56	SS	16·2	—

Additional readings :—
Triest e = +1m.18s. = P* − 1s., iPP = +1m.28s. = P_g − 2s., i = +1m.57s. and +2m.7s., iSS = +2m.37s., iSSS = +2m.48s., i = +3m.5s.
Zagreb e = +1m.14s. = P* − 3s., eP_g = +1m.25s., iPPS = +2m.15s. = S* − 3s., iPPSS = +2m.20s. = S_g − 9s.
Treviso PP = +1m.42s., SS = +3m.48s., SSS = +5m.44s.
Belgrade e = +2m.20s. = P* − 6s. and +2m.23s., eNE = +2m.35s. = P_g − 3s.
Vienna iN = +2m.13s., iE = +2m.17s., P_g = +2m.19s., iN = +2m.51s., iE = +3m.15s. and +3m.26s., S* = +3m.35s., iE = +3m.39s., SS = +3m.56s., iN = +3m.58s.
Stuttgart eN = +4m.58s., eEZ = +5m.10s.
Long waves were also recorded at Tashkent and other European stations.

March 7d. 22h. 21m. 29s. Epicentre 39°·5N. 145°·0E. (as on 1932 July 10d.). X.

A = − ·632, B = + ·443, C = + ·636; D = + ·574, E = + ·819;
G = − ·521, H = + ·365, K = − ·772.

		△	Az.	P.	O − C.	S.	O − C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		3·0	263	i 0 39	− 4	i 1 9	− 8	—	—
Tyosi		5·0	222	e 1 10	− 1	2 2	− 6	—	—
Nagoya		7·7	239	e 1 54	+ 5	3 15	− 1	—	—
Osaka		9·0	241	2 17	+10	4 16	S*	—	5·2
Ekaterinburg		55·0	318	e 10 26	(− 8)	e 21 20	SS	28·5	—
Berkeley		68·9	57	e 24 1	SS	—	—	—	—
Tinemaha		71·9	56	i 11 23	+ 1	—	—	—	—
Mount Wilson	z.	73·7	58	e 11 32	− 1	—	—	—	—
Pasadena	z.	73·8	58	e 11 32	− 1	—	—	—	—

Long waves were also recorded at Baku and Tiflis.

March 7d. Local shocks connected with the shock of 2d. were recorded at Japanese stations as follows:—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 0	53	34	e 17	26	5	e 17	26	27
			e 3	46	24	i 17	39	55	e 17	40	22
e 7	24	56	7	25	20	e 18	1	57	i 18	2	26
e 10	1	0	e 10	1	23	e 19	58	5	e 19	58	42
e 11	3	5	e 11	3	30	i 20	5	55	i 20	6	22
			e 11	59	3	i 22	48	17	i 22	48	47
e 16	57	25	e 16	57	53				e 23	24	58
i 17	3	31	e 17	4	1	e 23	29	16	e 23	29	45
						e 23	33	39	e 23	34	11

Tyosi.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			i 6	15	58	e 17	4	2	17	4	57
e 7	25	21	7	26	2	e 17	40	54	17	41	47

Nagoya.

P.			S.		
h.	m.	s.	h.	m.	s.
e 17	41	57	e 17	43	16

March 7d. Readings also at 2h. (near Nagasaki), 3h. (near Sumoto), 11h. (near La Paz), 12h. (near Taikyu), 14h. (Alicante and near Tananarive), 18h. (Ekaterinburg and Tashkent), 20h. (Sucre and near La Paz), 21h. (near Naples (2)), 22h. (near Lick), 23h. (near Athens).

March 8d. 1h. 35m. 44s. Epicentre 39°·6N. 144°·0E. N.2.
(as given by Tokyo and the Japanese stations).

A = − ·623, B = + ·453, C = + ·637; D = + ·588, E = + ·809;
G = − ·516, H = + ·375, K = − ·771.

	△	Az.	P.	O − C.	S.	O − C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	2·3	258	i 0 28	− 5	i 0 50	− 9	—	—
Tyosi	4·6	213	i 1 8	+ 2	2 1	+ 3	—	2·5
Nagoya	7·1	234	1 45	+ 4	3 8	+ 7	—	3·6
Toyooka	8·3	244	e 1 55k	− 3	i 3 31	0	—	—
Osaka	8·3	237	1 52	− 6	3 56	S*	—	4·8
Kobe	8·6	238	2 1	− 1	e 3 48	+ 9	—	4·6
Sumoto	8·9	237	2 12	+ 6	4 8	S*	—	4·5
Koti	10·3	238	2 26	+ 1	4 30	+ 9	5·1	—
Keizyo	13·4	267	3 4	− 3	5 24	−13	6·4	—
Zinsen	13·7	266	3 6	− 5	5 50	+ 6	e 6·6	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Heizyo	E.	14·1	275	3 12	− 5	—	—	e 7·0	—
Nanking		21·7	258	e 4 41	− 7	e 9 33	+50	12·6	—
Almata		49·0	298	i 8 52	+ 8	—	—	—	—
Andijan		53·1	296	9 11	− 4	e 16 36	− 7	—	—
Ekaterinburg		54·4	318	i 9 21	− 3	16 56	− 5	34·3	35·1
Tashkent		55·0	298	e 9 32	+ 3	e 17 18	+ 9	e 28·6	34·0
Pulkovo		66·7	330	e 10 51	+ 1	e 19 32	− 9	34·3	42·6
Baku		68·2	305	e 11 2	+ 3	—	—	33·3	43·3
Tiflis		70·6	309	e 10 53	−21	e 19 47	−41	38·3	45·7
Tinemaha		72·5	56	i 11 28	+ 2	—	—	—	—
Santa Barbara		73·1	59	i 11 30	+ 1	—	—	—	—
Haiwee		73·2	56	i 11 32	+ 2	—	—	—	—
Mount Wilson		74·3	58	i 11 38	+ 2	—	—	—	—
Pasadena		74·3	58	i 11 39	+ 3	—	—	—	—
Ksara		81·0	307	e 12 24	+11	e 22 19	− 7	—	—
Neuchatel		85·3	332	e 12 31	− 4	—	—	—	—
La Paz	N.	143·8	60	e 20 9	[+39]	—	—	—	—

Additional readings :—
Tyosi $S_g = +2$m.23s. $= S_g - 3$s.
Nagoya $P_g = +1$m.53s. $= P^* - 5$s.
Toyooka iPEN $= +1$m.58s., iSN $= +3$m.35s.
Long waves were also recorded at Hong Kong, Phu-Lien, and several European stations.

March 8d. 10h. 27m. 30s. Epicentre 33°·8N. 132°·5E. R.2.
(as on 1930 March 26d. and very near the position given by the Japanese stations, 33°·7N. 132°·4E.).

A = −·561, B = +·613, C = +·556 ; D = +·737, E = +·676 ;
G = −·376, H = +·410, K = −·831.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Matuyama		0·2	81	0 4	+ 1	0 11	+ 6	—
Kure		0·4	7	0 11	+ 5	0 20	+10	—
Hirosima		0·6	356	0 14	+ 5	0 26	+11	—
Koti		0·9	106	i 0 7	− 6	e 0 18	− 5	—
Hamada		1·1	342	0 19	+ 3	0 37	+ 9	—
Simidu		1·1	159	0 10	− 6	0 22	− 6	—
Tadotu		1·2	65	0 15	− 2	0 31	0	—
Simonoseki		1·3	277	0 19	+ 1	0 35	+ 2	—
Hukuoka		1·7	263	0 24	0	0 43	− 1	0·8
	B.	1·7	263	0 25	+ 1	0 47	+ 3	—
Miyazaki		2·0	205	0 29	0	0 54	+ 3	—
Sumoto		2·1	74	0 32	+ 2	1 0	+ 6	1·1
Wakayama		2·3	79	0 33	0	0 54	− 5	—
Nagasaki		2·4	244	e 0 34	0	1 12	S_g	—
Kobe		2·4	68	e 0 35	+ 1	1 7	S*	1·3
Toyooka		2·7	48	i 0 45	P*	i 1 15	S*	1·4
Osaka		2·7	71	0 42	+ 3	1 23	S_g	1·8
Siomisaki		2·8	97	0 36	− 4	1 18	+ 6	—
Husan		3·1	294	e 0 56	P*	e 1 43	S_g	—
Kameyama		3·5	72	0 47	− 3	1 53	S_g	—
Ibukisan		3·6	62	0 51	0	1 46	S*	—
Gihu		3·9	65	0 55	− 1	—	—	—
Nagoya		3·9	68	0 56	0	2 34	+54	—

Additional readings :—
Sumoto eZ $= +45$s.
Kobe iN $= +45$s. $= P_g + 3$s., i $= +51$s., SE $= +1$m.11s. $= S_g - 2$s.
Toyooka iPZ $= +49$s. $= P_g + 1$s.

March 8d. Local shocks apparently connected with the shock of 2d. were recorded at Japanese stations as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 1	53	32				e 11	46	41
			e 2	48	53	e 12	26	31	e 12	27	3
3	30	46	e 3	31	6	12	42	56	12	43	23
			e 8	9	30				e 13	4	18
e 8	22	46	e 8	23	12				e 13	13	11
e 8	44	5	e 8	44	30	e 13	24	18	i 13	24	47
e 8	52	5	e 8	52	35	i 13	48	47	e 13	49	8
e 10	20	39	e 10	21	7	e 14	33	49	e 14	34	25
			e 10	32	35	e 15	13	42	e 15	14	8
e 11	7	41	11	8	12	e 21	25	2	e 21	25	37
e 11	36	52	e 11	37	23	e 23	3	29	e 23	4	0

Tyosi.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 3	31	52	3	32	40	e 13	49	9	13	49	50
e 12	43	13	12	44	19				15	14	51
			13	25	28				20	18	36

Nagoya.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 3	32	14	3	33	48	e 13	49	56	13	51	4
e 12	44	4	12	45	8						

March 8d. Readings also at 2h., 3h., and 5h. (near Athens), 8h. (Lick, Christchurch, near New Plymouth, and Wellington (2)), 10h. (Amboina), 11h. (Lick), 14h. (Ekaterinburg, Tashkent, Andijan, Tchimkent, and Samarkand), 18h. (near Santiago), 19h. (Kobe and near Sumoto), 21h. (Huancayo).

March 9d. 4h. 23m. 5s. Epicentre 33°·0N. 137°·0E. N.3.

A = −·613, B = +·572, C = +·545.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Osaka		2·0	324	0 28	− 1	0 56	S*	1·3
Nagoya		2·2	359	0 31	0	0 57	0	—
Sumoto		2·2	307	0 33	+ 2	0 58	+ 1	1·0
Kobe		2·3	318	0 32k	− 1	i 1 1	+ 2	1·0
Koti	z.	2·9	281	i 0 42	+ 1	—	—	—
Toyooka		3·1	325	e 0 46	+ 2	i 1 20	0	1·4

Osaka gives also i = +32s. =P* +1s.
Toyooka iPZ = +49s.

March 9d. 19h. 36m. 55s. Epicentre 36°·3N. 136°·3E. (as on 1930 Oct. 20d.). X.

A = −·583, B = +·557, C = +·592.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Nagoya	1·2	155	i 0 20	+ 3	0 38	+ 7	—
Toyooka	1·4	238	i 0 17	− 3	i 0 33	− 3	0·6
Osaka	1·7	200	0 25	+ 1	0 49	S*	0·8
Kobe	1·9	209	e 0 21	− 7	0 49	0	0·9
Sumoto	2·2	210	e 0 38	P_g	1 2	S*	1·1
Koti	3·5	221	1 5?	P_g	—	—	—

Osaka gives also i = +28s. =P_g +0s.

March 9d. Local shocks apparently connected with the shock of March 2d. were recorded at Japanese stations as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 0	24	25				e 10	43	6
e 3	8	54	e 3	9	23	e 14	5	58	i 14	6	40
e 5	35	0	i 5	35	33				e 15	46	50
			e 7	16	25	e 16	2	58	e 16	3	22
			e 7	31	55	e 16	6	46	i 16	7	10
			e 8	51	58	e 17	5	49	e 17	6	18
9	55	43	i 9	56	8	e 17	45	13	i 17	45	30
			e 10	40	38	e 19	16	0	i 19	16	29

Tyosi.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 5	35	25	5	36	14	e 9	56	34	9	57	27

Nagoya.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 5	36	18	5	37	28	e 9	57	9	9	58	11
e 6	41	25	6	42	12						

March 9d. Readings also at 3h. (near Taikyu), 4h. (Sebastopol and Yalta), 5h. (La Paz), 6h. (Berkeley, Lick, Mizusawa, and near Tyosi), 8h. (Andijan), 9h. (Riverside, Mount Wilson, Pasadena, Tinemaha, and Wellington), 10h. (Riverside, Mount Wilson, Pasadena, and Tinemaha), 13h. (Zagreb), 14h. (Lick), 16h. (near Amboina (2)), 17h. (Andijan, New Plymouth, Takaka, and near Wellington), 20h. (Adelaide, Melbourne, Riverview, Sydney, Suva, Wellington, Mount Wilson, Pasadena, and near St. Louis, Tiflis, Pulkovo, Copenhagen, De Bilt, Stuttgart, and near Athens), 21h. (Baku, Ekaterinburg, Tiflis, Perth, and Huancayo), 22h. (De Bilt, Uccle, Paris, Strasbourg, Stuttgart, Florence, Granada, and San Fernando), 23h. (Florence).

March 10d. Local shocks from the neighbourhood of the great earthquake of March 2d. were recorded by Japanese stations as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 1	22	59	e 11	59	41	i 12	0	12
			e 1	27	2	e 12	16	56	e 12	17	30
e 2	49	7	e 2	49	42	e 13	44	10	e 13	44	29
e 3	34	10	e 3	34	40	e 14	50	28	e 14	50	59
e 5	8	27	e 5	8	57	e 15	8	39	e 15	9	1
i 7	35	39	i 7	36	8	i 19	51	17	i 19	51	46
			e 7	47	53				e 20	1	51
e 8	0	8	e 8	0	39	e 21	29	30	e 21	29	59
i 8	4	17	i 8	4	46	e 22	33	55	22	34	45
			e 9	3	46	e 23	16	21	e 23	16	45
			e 9	51	3	e 23	22	57	e 23	23	27

Tyosi.
iP =7h.36m.13s. S =7h.37m,0s.

Nagoya.
eP =7h.36m.32s. S =7h.37m.57s.

Osaka.
P =7h.37m.20s. S =7h.39m.23s.

March 10d. Readings also at 0h. (Wellington, Ekaterinburg, Tashkent, near Andijan, and Samarkand), 1h. (near Andijan), 6h. (Baku, Ekaterinburg, Tiflis, Pulkovo, Copenhagen, Cheb, De Bilt, Uccle, Strasbourg, Stuttgart, Kew, Triest, near Athens, and near Tananarive), 7h. (Chiufeng, Hong Kong, and Pulkovo), 8h. (Baku, Ekaterinburg (2), and Tiflis), 10h. (Lick), 11h. (Lick (2), Tyosi, and near Hukuoka), 12h. (Lick, Tyosi, and near Hukuoka), 14h. (Granada), 15h. (Nanking, Hastings, Alicante, and near Tyosi), 16h. (near Granada and Malaga), 18h. (Tchimkent, New Plymouth, Trenta, and near Wellington), 19h. (Perth), 20h. (Baku, Ekaterinburg, and La Paz) 23h. (Andijan).

March 11d. 1h. 54m. 14s. Epicentre 33°·6N. 118°·0W. N.1.
(as given by H. O. Wood, see Bull. Seis. Soc., Amer. Vol., XXIII, No. 2).

Probable error ±0°·18.

A = −·391, B = −·735, C = +·553; D = −·883, E = +·469;
G = −·260, H = −·489, K = −·833.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Pasadena	0·6	346	i 0 5	− 4	—	—	—	—
Mount Wilson	0·6	356	i 0 7	− 2	—	—	—	—
Riverside	0·7	53	i 0 7	− 3	—	—	—	—
La Jolla	1·0	139	i 0 10	− 4	—	—	—	—
Santa Barbara	1·7	301	i 0 23	− 1	—	—	—	—
Haiwee	2·6	0	i 0 36	− 1	—	—	—	—
Tinemaha	3·5	358	i 0 50	0	—	—	—	—
Lick	4·8	323	e 1 7	− 1	—	—	—	—
Branner	5·1	320	i 1 12	− 1	—	—	—	—
Berkeley	5·5	322	e 1 17k	− 1	—	—	—	—
San Francisco	5·5	320	e 1 15	− 3	—	—	—	—
Tucson	6·2	100	i 1 27	1	i 2 54	+16	—	—
Ukiah	7·0	324	e 1 34	− 5	2 49	−10	i 3·1	—
Denver	12·1	56	e 2 57	+ 7	i 5 5	0	—	6·3
Bozeman	13·2	22	i 3 7	+ 2	i 5 47	+15	6·8	—
Spokane	14·0	2	i 3 16	+ 1	i 6 2	+11	—	7·4
Seattle	14·4	348	e 3 30	+ 9	6 17	+16	—	—
Saskatoon	20·2	20	4 36	+ 4	8 21	+11	10·8	—
Little Rock	21·2	80	i 4 42	0	i 8 40	+10	e 11·4	—
St. Louis	22·9	69	i 5 0	0	i 9 21	+18	i 11·2	12·1
Madison	24·2	58	i 5 13	+ 1	i 9 31	+ 4	11·7	—
Chicago	25·3	62	i 5 23	0	9 49	+ 3	12·9	—
Sitka	26·3	338	5 34	+ 2	i 10 8	+ 5	e 11·7	—
Ann Arbor	28·2	62	e 5 46	− 3	e 10 46	+11	i 14·6	15·6
Columbia	30·5	78	—	—	e 11 16	+ 4	e 13·9	—
Pittsburgh	30·9	65	i 6 14	+ 1	i 11 25	+ 7	i 15·6	—
Toronto	31·5	59	e 6 15	− 3	i 11 24	− 4	i 15·6	17·9
Buffalo	31·8	61	i 6 23	+ 2	i 11 39	+ 7	—	—
Charlottesville	32·1	70	e 6 16	− 8	11 54	+17	e 15·9	—
Georgetown	33·1	68	i 6 32	− 1	i 11 53	+ 1	e 17·3	—
Ottawa	34·2	56	e 6 44	+ 2	e 12 10	+ 1	e 16·8	—
Fordham	35·5	65	i 6 52	− 1	i 12 31	+ 2	e 17·8	19·3
Honolulu T.H.	37·1	261	e 7 46	+39	—	—	e 15·4	—
Harvard	37·5	62	e 7 11	0	e 13 2	+ 3	e 18·3	—
East Machias	40·1	59	7 38	+ 5	e 13 42	+ 4	19·0	—
San Juan	48·5	95	i 8 43	+ 3	15 36	− 4	25·0	—
Ivigtut	51·4	36	8 58	− 4	20 28	?	29·8	—
Huancayo	61·2	131	i 10 12	− 1	18 33	+ 1	e 31·0	—
La Paz	69·0	128	11 11	+ 6	20 11	+ 2	35·2	37·4
Sucre	72·8	128	i 11 29	+ 1	—	—	—	—
Edinburgh	74·8	32	e 11 52	+13	21 26	+ 8	39·8	45·7
Durham	76·2	32	21 32	S	(21 32)	− 2	—	41·3
Bidston	76·4	34	i 21 38	S	(i 21 38)	+ 2	—	—
Liverpool	76·4	34	e 21 36	S	(e 21 36)	0	38·8	—
Stonyhurst	76·4	33	e 11 50	+ 2	e 21 43	+ 7	40·3	46·5
Oxford	78·3	35	12 8	+ 9	21 59	+ 2	e 39·9	51·0
Kew	78·9	35	e 12 1	− 1	e 22 4	0	e 31·8	43·3
Upsala	79·7	21	e 12 3	− 3	e 22 8	− 4	e 38·8	48·8
Suva	80·2	240	—	—	e 22 46?	+28	—	—
De Bilt	81·0	31	12 15a	+ 2	22 27	+ 1	e 38·8	45·5
Copenhagen	81·3	26	12 16	+ 1	22 29	− 1	38·8	—
Helsingfors	81·4	17	—	—	i 22 20	−11	e 39·5	—
Uccle	81·5	33	12 17a	+ 1	i 22 33	+ 1	e 38·8	45·1
Paris	82·1	35	i 12 19	0	—	—	34·8	45·8
Hamburg	82·2	28	e 12 18	− 1	22 37	− 2	e 38·8	43·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Pulkovo		83·0	15	12 24	+ 1	i 22 45	− 2	39·8	48·5
Göttingen		83·4	30	—	—	e 22 46	− 5	e 39·8	43·8
Sumoto		83·6	307	e 17 28	PPP	(e 22 1)	−52	—	—
Potsdam		84·0	28	i 12 30	+ 2	e 22 46	−12	e 39·8	45·8
Jena		84·5	29	e 12 16	−15	e 22 46	−17	e 45·8	48·3
Toledo		84·6	45	e 12 31	0	e 22 58	− 6	e 38·1	44·0
Strasbourg		84·7	32	i 12 32a	0	e 23 6	+ 1	35·8	52·8
Stuttgart		85·2	32	e 12 35a	+ 1	e 23 7	− 3	e 40·8	49·0
San Fernando		85·4	49	—	—	22 50	−22	41·2	48·8
Cheb		85·5	29	—	—	e 23 16	+ 3	e 43·8	48·8
Neuchatel		85·5	34	e 12 38	+ 2	e 23 17	+ 4	—	—
Zurich		85·9	33	e 12 36	− 2	e 23 13	− 4	—	—
Malaga		86·3	47	12 32	− 8	23 7	[− 1]	39·6	43·7
Tortosa	N.	86·5	42	e 12 41	0	e 23 26	+ 4	e 38·8	57·2
Granada		86·5	47	i 12 30a	−11	22 48	[−22]	42·6	49·9
Chur		86·7	33	e 12 43	+ 1	—	—	e 44·3	—
Almeria		87·4	47	—	—	e 22 38	[−38]	e 42·7	—
Alicante		87·6	44	e 12 24	−22	e 23 16	[− 1]	e 44·3	—
Piacenza		88·1	34	e 13 0	+12	23 38	0	38·8	58·8
Kucino		88·3	14	—	—	e 24 12	PS	e 44·3	50·4
Treviso		88·8	32	—	—	e 23 41	− 4	i 45·8	51·4
Venice		89·1	32	e 13 1	+ 8	e 23 13	[−14]	—	56·1
Ekaterinburg		89·5	1	i 12 57	+ 2	i 23 48	− 3	43·7	57·4
Triest		89·5	31	e 12 53	− 2	i 23 0	[−30]	e 35·8	46·3
Prato		89·7	33	e 12 59	+ 3	24 29	PS	42·8	50·8
Florence		89·8	34	12 59	+ 3	24 29	PS	39·3	50·3
Budapest		90·3	28	—	—	e 23 46?	−13	49·8	53·8
Algiers		90·7	44	e 12 19	−42	e 23 17	−46	43·8	—
Chiufeng		91·0	321	13 2a	0	23 38	[− 1]	e 45·3	63·5
Nanking		95·4	315	e 13 44	+22	23 58	[− 5]	—	58·2
Wellington		97·1	225	—	—	25 3	+ 2	45·8	—
Yalta		97·9	20	13 42	+ 8	—	—	53·8	—
Tiflis		103·1	14	19 17	PP	28 27	PS	48·8	65·9
Tashkent		104·8	354	e 16 19	?	e 24 53	[+ 4]	e 49·8	65·3
Baku		105·2	10	e 14 20	+12	e 24 56	[+ 5]	48·8	65·7
Hong Kong		105·2	311	—	—	24 55	[+ 4]	—	65·5
Manila		106·0	300	e 21 15	?	25 2	[+ 7]	49·8	57·8
Ksara		108·2	23	e 18 56	PP	28 21?	PS	59·8	—
Sydney		108·5	241	—	—	e 30 4	?	54·0	59·3
Melbourne		114·8	240	—	—	e 25 23	[−10]	53·3	66·8
Bombay	E.	126·5	347	e 18 46	[−14]	—	—	—	—
Batavia		130·3	293	e 22 4	?	—	—	—	—

Additional readings and note :—

Branner i = +1m.15s.
Berkeley iN = +1m.20s.
Tucson eP* = +1m.41s., iP_g = +2m.0s., iS* = +3m.8s.
Ukiah e = +1m.47s., iP* = +1m.52s., eP_g = +2m.6s., e = +2m.13s.
Denver iE = +3m.54s. and +5m.23s.
Bozeman eP* = +3m.50s.
St. Louis iPPEN = +5m.29s., iPPPEN = +5m.37s., iPPPPEN = +5m.40s., eP_gPEN = +8m.48s., eSSEN = +10m.22s., iSSSEN = +10m.39s., eSSSSEN? = +10m.50s. ; T_o = 1h.54m.8s. ?
Chicago iS = +10m.3s.
Sitka SS = +11m.11s.
Ann Arbor ePPE = +6m.28s., eN = +11m.28s., eSS = +12m.46s., eN = +13m.10s. ; T_o = 1h.53m.54s.
Toronto ePN = +6m.19s., PP = +7m.13s., iSS = +13m.27s., iSSSS = +14m.7s.
Charlottesville e = +11m.34s. and +15m.23s.
Ottawa ePPE = +7m.46s., eSE = +12m.22s., eN = +13m.26s., eSSSE = +15m.22s. ; T_o = 1h.54m.12s.
Fordham ePP = +8m.9s., e = +12m.43s., iSS = +14m.53s.
Harvard ePP = +7m.55s., eSS = +16m.43s.
East Machias e = +10m.13s., eS = +13m.57s., eSS = +16m.39s.
San Juan e = +10m.38s. = PP +12s. and +19m.31s.
Huancayo e = +20m.53s., eSS = +23m.4s.

Continued on next page.

Edinburgh PPP = +16m.15s., SSS = +30m.3s.
Liverpool eS = +32m.6s.
Stonyhurst PS? = +22m.17s., SSS? = +30m.31s.
Upsala ePS = +22m.57s., eSSS = +30m.54s.
De Bilt eSS = +27m.47s.
Copenhagen +15m.28s. =PP +13s., e = +23m.26s., +27m.52s. =SS +10s.
Helsingfors eSKSE = +22m.36s., eSSN = +28m.45s.
Uccle eSSE = +28m.5s.
Paris ePPE = +15m.52s.
Pulkovo PP = +15m.37s., SS = +28m.15s.
Göttingen eEN = +28m.4s. =SS +1s.
Sumoto S is given as ePE.
Potsdam ePEN = +12m.22s., e = +15m.46s. =PP +8s., eSS = +28m.46s. ?
Toledo P_cP = +13m.6s., PS = +24m.1s.
Strasbourg PS = +24m.7s., eSSS = +32m.49s.
Stuttgart ePS = +24m.9s., eSS = +28m.46s., eSSS = +32m.46s.
San Fernando SN = +23m.11s. =S −1s.
Malaga PP = +15m.41s., PS = +24m.7s.
Granada P_cP = +12m.48s., PP = +15m.51s.
Kucino e = +29m.13s. =SS −3s., +34m.17s., and +38m.4s.
Ekaterinburg iPP = +16m.42s., eSKS = +23m.22s., PS = +24m.56s., SS = +29m.58s.
Prato e = +22m.46s.
Florence PP = +16m.46s., SKS = +23m.40s., PS = +25m.46s., SS = +30m.34s., SSS = +34m.51s.
Chiufeng PS = +26m.14s.
Nanking SS = +35m.44s.
Wellington SS = +30m.46s. ?
Tiflis eSSZ = +34m.18s.
Tashkent e = +18m.30s. =PP +11s., +33m.58s., +37m.28s., and +42m.58s.
Baku PP = +18m.30s., PS = +27m.53s., SS = +33m.58s.
Hong Kong SS = +33m.11s.
Melbourne e = +36m.6s.
Bombay eN = +20m.46s. =PP −8s.
Long waves were also recorded at Koti, Phu-Lien, Hyderabad, Helwan, Belgrade, Vienna, Zagreb, and Barcelona.

March 11d. 14h. 22m. 4s. Epicentre 43°·0N. 148°·5E. (as on 1926 Mar. 8d.). R.2.

A = −·624, B = +·382, C = +·682 ; D = +·522, E = +·853 ;
G = −·582, H = +·356, K = −·731.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		5·5	313	1 19	+ 1	3 20	+60	—	4·0
Mizusawa		6·8	303	e 1 32	− 5	2 33	−20	—	—
Sikka		7·2	330	1 35	− 7	—	—	3·7	6·5
Nagoya		11·9	233	e 3 21	+34	—	—	8·5	—
Vladivostok		12·1	276	i 2 36	−14	4 58	− 7	5·8	7·4
Toyooka	E.	12·9	239	e 3 10	+ 9	—	—	e 8·5	11·7
	N.	12·9	239	e 2 24	−37	—	—	e 8·6	9·9
Osaka		13·1	235	2 43	−20	5 0	−29	—	10·5
Kobe		13·3	236	—	—	5 29	− 5	—	11·0
Sumoto	N.	13·7	235	2 25	−46	6 55	+71	9·8	11·1
Koti		15·0	236	e 3 20	− 8	—	—	e 7·1	—
Keizyo		17·2	259	e 3 53	− 4	e 6 58	− 8	8·4	10·3
Zinsen	N.	17·5	259	—	—	e 7 35	+22	—	—
Nagasaki		17·9	241	e 4 3	− 2	e 7 11	−11	10·0	14·6
Chiufeng		24·3	274	i 5 13a	0	9 25	− 3	11·3	18·8
Zi-ka-wei	Z.	24·5	250	i 5 16a	+ 1	9 28	− 4	14·6	19·4
Nanking		25·8	256	5 27	0	i 10 3	+ 8	13·5	15·2
Hong Kong		35·1	245	7 25	+35	12 18	− 5	16·1	23·4
Phu-Lien		41·3	251	e 8 46	+63	—	—	21·9	—
Sitka		48·1	45	—	—	15 51	+17	e 21·1	—
Calcutta		53·3	267	9 2	−14	16 34	−12	28·3	—
Ekaterinburg		54·2	318	i 9 24	+ 1	i 17 0	+ 2	33·6	35·4
Andijan		54·7	295	e 8 42	−44	16 29	−36	29·9	—
Tchimkent		55·8	298	e 9 38	+ 4	—	—	—	—
Tashkent		56·5	297	9 36	− 3	i 17 27	− 3	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Agra	E.	58·2	278	9 51	− 1	17 51	− 1	30·1	—
Medan		59·1	242	e 10 20	+22	e 20 41	(+55)	32·9	—
Hyderabad		63·8	269	10 28	− 3	19 6	+ 1	33·1	46·7
Pulkovo		65·5	330	10 40	− 2	19 29	+ 3	34·9	42·6
Bombay		66·9	275	e 10 45	− 6	i 19 46	+ 3	—	43·0
Helsingfors	N.	67·0	334	—	—	i 19 42	− 3	e 35·0	—
Suva		67·1	149	—	—	27 56?	?	—	—
Baku		69·0	307	11 6	+ 1	20 14	+ 5	35·9	45·5
Kodaikanal		69·2	266	11 5	− 1	20 17	+ 6	42·1	—
Upsala		69·6	336	—	—	e 20 12	− 4	e 39·9	46·6
Tiflis		71·1	309	i 11 19	+ 2	i 20 37	+ 3	37·9	50·8
Theodosia		73·8	317	e 11 47	+14	e 21 1	− 5	43·9	—
Copenhagen		74·5	336	11 38	+ 1	21 12	− 2	37·9	—
Riverview		76·9	177	—	—	e 35 20	?	e 42·6	45·4
Hamburg		77·2	336	e 11 59	+ 6	e 21 37	− 8	e 36·9	47·9
Potsdam		77·2	334	i 11 56?	+ 3	21 32	−13	e 40·9	47·9
Edinburgh		78·2	344	—	—	e 21 56?	0	44·9	—
Prague		78·7	332	—	—	e 20 56?	−66	—	47·9
Göttingen		78·9	335	e 11 50	−12	e 21 44	−20	e 41·9	45·1
Jena		78·9	333	e 12 26	+24	e 21 56	− 8	e 38·9	49·9
Durham		79·0	342	—	—	22 0	− 5	—	48·2
Budapest		79·2	328	e 12 56?	+52	21 56?	−11	e 36·9	52·9
Cheb		79·4	333	e 22 14	S	(e 22 14)	+ 5	e 41·9	48·9
Vienna		79·5	330	12 6	+ 1	—	—	e 44·9	55·9
De Bilt		79·8	338	12 8	+ 1	22 14	0	e 38·9	43·5
Stonyhurst		80·0	344	—	—	i 22 17	+ 1	43·9	—
Melbourne		80·8	182	—	—	i 22 20	− 4	40·9	—
Uccle		81·2	338	e 12 16	+ 2	e 22 27	− 1	e 39·9	—
Ksara		81·6	308	e 12 22?	+ 6	22 40	+ 7	—	—
Stuttgart		81·6	335	e 12 16	0	e 22 24	− 9	e 43·9	53·5
Zagreb		81·7	328	e 11 56?	−21	e 22 12?	−22	43·9	48·9
Kew		81·7	340	e 12 20	+ 3	e 23 23	PS	e 43·9	46·7
Oxford		81·8	341	—	—	22 31	− 4	—	56·4
Strasbourg		82·2	335	e 12 26?	+ 7	e 22 34	− 5	e 31·9	53·4
Triest		82·7	330	e 12 8	−14	i 23 23	PS	—	47·9
Zurich		83·0	334	e 12 40	+17	—	—	—	—
Chur		83·1	334	e 12 21	− 3	—	—	e 44·1	—
Treviso		83·2	331	—	—	e 36 46	?	e 47·9	55·4
Venice		83·4	331	13 29	+64	23 50	PS	—	53·1
Paris		83·5	339	e 12 26	0	e 20 56?	?	44·9	54·9
Neuchatel		83·8	334	e 12 25	− 2	e 22 45	−10	—	—
Piacenza		84·6	332	e 11 32	−59	23 4	0	44·9	53·5
Cincinnati	Z.	84·9	38	—	—	i 26 46	?	i 49·6	—
Florence		85·2	330	12 21	−13	23 41	PS	26·9	44·9
Puy de Dôme		86·2	337	—	—	e 32 24	SSS	e 51·9	—
Wellington		87·5	160	—	—	e 29 56?	SS	52·9	—
Algiers		94·3	332	—	—	e 39 56?	?	e 57·9	—
Granada		95·9	339	—	—	e 26 5	PS	e 52·0	64·1
San Fernando		97·1	340	—	—	24 1	[−11]	—	64·9
La Paz		139·1	61	e 23 34	PKS	—	—	78·4	79·9

Additional readings :—
Kobe eN = +5m.36s.
Sumoto eZ = +3m.43s., SEZ = +6m.58s.
Chiufeng i = +5m.37s. = PP − 4s. and +7m.31s.
Zi-ka-wei PPZ = +5m.52s., iZ = +6m.10s., and +10m.10s. = SS − 7s., SSZ = +10m.34s.
Nanking iZ = +5m.51s. = PP − 10s.
Sitka SS = +19m.39s.
Ekaterinburg L_q = +29m.32s.
Tiflis ePPPZ = +15m.56s., eSSSE = +29m.51s.
Potsdam iSN = +21m.42s.
Cheb eS = +31m.38s.
Stuttgart e = +12m.37s.
Kew ePPN = +16m.4s., eSKS = +22m.15s.
Strasbourg ePS = +23m.3s., eSS = +26m.56s.?
Cincinnati iZ = +32m.19s.
San Fernando SN = +24m.14s.
Long waves were also recorded at Honolulu T.H., Huancayo, San Juan, Taikyu, Tyosi, Almata, Yalta, and other European and American stations.

March 11d. 19h. 32m. 46s. Epicentre 26°·2N. 141°·0E. (as on 1931 Aug. 15d.). R.1.

A = −·697, B = +·565, C = +·442 ; D = +·629, E = +·777 ;
G = −·343, H = +·278, K = −·897.

A *depth* of focus 0·080 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Titizima		+3·0	1·4	50	1 3	0	1 54	+ 1	—	—
Hatidyozima		+0·2	6·9	351	1 42	+ 1	2 55	− 6	—	—
Siomisaki		−0·3	8·5	329	1 52	− 4	3 23	− 6	—	—
Mera		−0·4	8·7	354	1 49	− 9	3 30	− 1	—	—
Omaesaki		−0·4	8·7	345	1 58	0	3 29	− 2	—	—
Misima		−0·5	9·0	349	1 59	− 1	3 35	− 1	—	—
Hamamatu		−0·5	9·0	342	2 5	+ 5	3 26	−10	—	—
Numadu		−0·5	9·1	349	2 2	0	3 34	− 5	—	—
Yokohama		−0·6	9·3	353	2 2	− 1	3 41	0	—	—
Kameyama		−0·6	9·4	337	2 4	− 1	3 42	− 2	—	—
Tyosi		−0·7	9·5	359	i 2 5	0	i 3 43	− 1	—	3·8
Wakayama		−0·7	9·5	329	2 30	+25	4 3	+19	—	—
Tokyo		−0·7	9·5	354	2 5a	0	3 43	− 1	—	3·8
Hunatu		−0·7	9·5	349	2 1	− 4	3 39	− 5	—	—
Simidu		−0·7	9·6	315	2 3	− 3	3 41	− 5	—	—
Nagoya		−0·7	9·6	340	i 2 5	− 1	3 44	− 2	—	4·2
Kohu		−0·7	9·6	348	2 5	− 1	3 46	0	—	—
Sumoto		−0·7	9·6	328	i 2 4k	− 2	i 3 45	− 1	—	3·9
Osaka		−0·8	9·7	332	2 6	0	3 41	− 5	—	4·0
Osaka	B.	−0·8	9·7	332	2 7	+ 1	3 45	− 1	—	—
Gihu		−0·8	9·8	339	2 9	+ 2	3 45	− 4	—	—
Koti		−0·8	9·8	320	i 2 6k	− 1	e 3 44	− 5	—	—
Kobe		−0·8	9·8	331	i 2 7k	0	3 43	− 6	—	3·9
Hikone		−0·9	9·9	337	2 10	+ 3	3 46	− 3	—	—
Kyoto		−0·9	9·9	334	2 10	+ 3	3 45	− 4	—	—
Kakioka		−0·9	10·0	356	2 10	+ 1	3 50	− 1	—	—
Kumagaya		−0·9	10·0	352	2 8	− 1	3 50	− 1	—	—
Miyazaki		−0·9	10·1	306	2 10	0	3 53	− 1	—	—
Mito		−1·0	10·2	357	2 14	+ 4	3 53	− 1	—	—
Maebasi		−1·0	10·3	351	2 11	0	3 53	− 3	—	—
Matuyama		−1·0	10·4	319	2 13	0	4 3	+ 4	—	—
Nake		−1·0	10·4	284	2 16	+ 3	4 6	+ 7	—	—
Nagano		−1·1	10·7	348	2 16	0	4 5	+ 2	—	—
Toyooka		−1·1	10·7	332	i 2 16k	0	i 4 4	+ 1	—	4·2
Toyama		−1·2	10·9	343	2 19	+ 2	4 10	+ 4	—	—
Kumamoto		−1·2	11·1	309	2 19	0	4 13	+ 2	—	—
Hamada		−1·3	11·5	321	2 24	0	4 13	− 5	—	—
Wazima		−1·3	11·7	344	3 28	+62	5 22	+59	—	—
Nagasaki		−1·3	11·7	306	i 2 26	0	i 4 25	+ 2	—	4·5
Hukuoka		−1·3	11·7	311	i 2 26k	0	i 4 24	+ 1	—	4·5
Naha		−1·4	11·9	273	2 32	+ 4	4 30	+ 4	—	—
Tomie		−1·6	12·6	304	2 41	+ 6	4 43	+ 5	—	—
Mizusawa		−1·7	12·9	0	i 2 40	+ 3	i 4 52	+ 9	—	—
Morioka		−1·8	13·5	0	2 47	+ 3	5 3	+ 8	—	—
Akita		−1·8	13·5	357	2 47	+ 3	5 4	+ 9	—	—
Husan		−1·8	13·6	314	2 43	− 3	e 3 26	?	—	—
Taikyu		−2·0	14·3	315	1 28	−84	3 49	−81	—	—
Isigakizima		−2·3	15·3	267	3 6	+ 4	5 39	+12	—	—
Keizyo		−2·5	16·4	317	3 11	− 3	5 45	− 4	—	—
Zinsen		−2·5	16·6	317	3 13	− 4	5 43	−10	—	—

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Sapporo		−2·6	16·8	1	3 23	+ 5	6 5	+ 9	—	—
Taihoku		−2·7	17·5	270	3 30	+ 4	i 6 17	+ 7	—	—
Nemuro		−2·7	17·5	11	3 30	+ 4	6 11	+ 1	—	—
Zi-ka-wei		−2·8	17·8	291	i 3 28k	0	6 16	+ 1	—	10·0
Heizyo		−2·8	18·1	319	i 3 31	− 1	i 6 22	0	—	—
Vladivostok		−2·9	18·4	339	i 3 27	− 8	5 26	−61	6·4	6·5
Hokoto		−3·1	19·6	267	e 3 41	− 7	e 6 49	− 1	—	—
Palau		−3·2	19·9	199	4 1	+11	7 15	+20	—	—
Nanking		−3·2	20·2	292	i 3 50k	− 4	i 6 58	− 4	11·3	12·2
Dairen		−3·2	20·6	313	3 56	− 3	7 11	0	—	—
Manila		−3·5	22·0	242	4 14a	+ 1	7 40	+ 4	—	—
Sikka		−3·7	23·0	3	4 14	− 8	—	—	6·6	9·4
Hong Kong		−4·0	24·7	267	4 31	− 6	8 14	− 6	—	11·0
Chiufeng	E.	−4·0	24·9	310	4 44	+ 5	e 7 10	−74	8·8	—
Phu-Lien		−5·1	31·9	268	i 5 38	+ 2	10 4	− 8	12·7	—
Amboina		−5·1	32·3	205	i 5 32	− 8	i 10 11	− 7	—	—
Medan		−6·8	46·4	249	i 7 30	+ 1	i 13 33	+ 3	—	—
Batavia		−6·8	46·4	232	i 7 37k	+ 8	13 51	+21	—	—
Malabar		−6·8	46·6	231	i 7 38	+ 8	i 13 57	+24	—	—
Calcutta		−6·9	47·7	279	8 2	+23	12 3	−105	14·6	—
Almata		−7·5	53·9	307	e 8 33	+ 9	—	—	—	—
Agra	E.	−7·6	55·7	287	8 40	+ 3	e 15 36	+ 2	—	—
Honolulu T.H.		−7·6	55·8	81	i 8 52	+14	i 16 6	+30	—	—
Suva		−7·7	57·4	138	—	—	17 14?	+77	—	—
Andijan		−7·8	57·5	304	i 8 55	+ 6	16 9	+12	38·2	—
Hyderabad		−7·8	58·2	276	8 51	− 3	16 16	+10	27·1	35·6
Tchimkent		−7·9	59·4	307	—	—	i 16 43	+21	—	—
Tashkent		−7·9	59·8	306	i 9 10	+ 4	e 15 8	−79	—	—
Riverview		−7·9	60·9	171	i 17 2	S	(i 17 2)	+20	e 29·0	31·2
Colombo		−7·9	61·1	264	9 19	+ 4	16 57	+12	—	31·3
Adelaide		−7·9	61·2	183	i 9 23	+ 7	i 17 3	+17	—	—
Kodaikanal		−8·0	61·8	269	i 9 23	+ 3	20 29	(+24)	—	—
Samarkand		−8·0	61·8	304	e 10 22	+62	e 17 54	+61	—	—
Bombay		−8·0	62·6	280	9 29	+ 3	i 17 15	+11	—	31·7
Ekaterinburg		−8·0	63·1	325	i 9 32	+ 2	17 18	+ 7	43·3	—
Melbourne		−8·1	64·2	177	—	—	i 17 47	+23	i 32·2	—
Sitka		−8·1	64·9	37	i 9 49	+ 7	i 17 51	+17	—	—
Baku		−8·7	74·1	309	i 10 42	+ 1	i 19 30	+ 5	31·2	47·5
Victoria	E.	−8·8	74·3	44	10 48	+ 6	(19 40)	+14	19·7	—
Wellington		−8·8	74·5	155	—	—	i 19 41	+12	—	—
Seattle		−8·8	75·2	45	e 12 50	pP	i 19 50	+13	—	—
Tiflis		−9·0	77·2	312	i 10 57	− 2	i 19 58	− 1	e 38·2	50·8
Ukiah		−9·0	78·0	53	—	—	i 20 19	+10	e 36·2	—
Berkeley		−9·1	79·2	54	i 11 13a	+ 2	i 20 31	+ 9	—	—
Helsingfors		−9·1	79·2	335	e 11 3	− 8	i 20 16	− 6	e 27·4	—
Branner		−9·2	79·4	54	e 11 14	+ 2	—	—	—	—
Lick		−9·2	79·9	54	e 11 16	+ 1	—	—	—	—
Theodosia		−9·3	81·8	318	i 11 21	− 5	i 20 46	− 5	42·2	—
Upsala		−9·3	82·3	337	i 11 21	− 8	i 20 47	−10	e 33·2	45·5
Tinemaha		−9·3	82·4	53	i 11 30	+ 1	i 21 1	+ 3	—	—
Santa Barbara		−9·3	82·5	55	i 11 24	− 6	i 20 54	− 5	—	—
Yalta		−9·3	82·8	318	e 11 27	− 5	e 20 56	− 7	—	—
Haiwee		−9·3	83·0	53	i 11 40	+ 7	i 21 11	+ 6	—	—
Bozeman		−9·3	83·0	42	—	—	i 21 5	0	—	—
Sebastopol		−9·3	83·2	319	12 10	+36	21 40	+33	—	—
Pasadena		−9·4	83·8	55	—	—	i 21 8	− 5	—	—
Mount Wilson		−9·4	83·9	55	i 13 24	?	i 21 14	0	—	—
Riverside		−9·4	84·5	55	i 13 25	?	i 21 13	− 8	—	—
La Jolla		−9·4	85·1	56	i 11 42	− 2	i 21 18	−10	—	—
Bergen		−9·5	86·2	342	—	—	i 23 24	?	—	—

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Ksara		−9·5	87·0	307	e 11 45?	−10	21 24	−24	—	—
Copenhagen		−9·5	87·1	336	i 11 46	− 9	e 21 22	−27	—	—
Potsdam		−9·7	89·2	333	e 11 55	−10	i 21 53	−17	—	—
Hamburg		−9·7	89·6	336	i 11 58k	− 9	e 21 40	−35	e 39·2	52·2
Budapest		−9·7	89·7	326	11 54	−14	21 39	−37	e 46·2	—
Prague		−9·7	90·0	330	e 12 3	− 6	e 22 5	−14	—	49·2
Tucson		−9·7	90·0	54	e 12 14	+ 5	i 22 15	− 4	—	—
Vienna		−9·7	90·5	328	i 12 2	−10	21 44	−40	—	54·2
Jena		−9·7	90·9	331	e 12 1	−13	e 22 5	−23	e 37·2	—
Cheb		−9·7	91·2	331	e 15 49	?	e 25 28	PS	e 47·2	50·2
Gottingen		−9·7	91·2	333	i 12 3	−13	e 21 44	−48	e 46·2	53·2
Edinburgh		−9·7	92·4	342	—	—	i 22 22	−22	—	—
Helwan		−9·7	92·4	306	—	—	i 21 52	−52	—	—
Zagreb		−9·7	92·4	326	e 12 11	−11	e 21 54	−50	e 46·2	—
De Bilt		−9·8	92·7	336	i 12 12k	−11	i 21 58	−48	—	49·5
Durham		−9·8	92·9	340	—	—	22 25	−23	—	57·2
Stuttgart		−9·8	93·6	332	12 16k	−11	e 21 59	−56	—	—
Triest		−9·8	93·6	327	e 12 14k	−13	i 21 58	−57	—	—
Stonyhurst		−9·8	93·8	341	—	—	i 22 1	−57	—	—
Uccle		−9·8	94·0	336	i 12 18k	−11	i 22 4	−56	—	—
Treviso		−9·8	94·4	328	i 11 59	−32	e 22 9	−55	52·2	67·2
Liverpool		−9·8	94·4	341	—	—	i 22 4	−60	—	—
Strasbourg		−9·8	94·4	332	i 12 19k	−12	i 22 39	−25	e 35·2	—
Bidston		−9·8	94·5	341	16 24	?	26 11	PS	—	—
Venice		−9·8	94·5	328	11 14?	−78	22 8	−57	—	—
Chur		−9·8	94·7	331	e 11 21	−72	e 22 5	−62	—	—
Padova		−9·8	94·7	328	e 12 31	− 2	e 22 16	−51	—	—
Zurich		−9·8	94·9	331	e 12 22	−12	e 22 42	−27	—	—
Kew		−9·8	95·2	338	i 12 21	−14	i 22 45	−27	—	—
Oxford		−9·8	95·3	339	e 12 16	−20	22 42	−31	—	—
Neuchatel		−9·8	95·8	332	e 12 26	−12	e 22 11	−67	—	—
Piacenza		−9·8	96·0	330	e 12 14	−25	22 14	−65	37·2	57·7
Florence		−9·8	96·2	327	12 29	−11	22 56	−25	26·2	—
Paris		−9·8	96·3	335	i 12 25	−16	22 15	−67	26·2	54·2
Trenta		−9·8	96·6	321	e 9 54	?	—	—	—	—
Madison		−9·8	96·7	35	i 16 39	PP	i 22 19	−67	—	—
Naples	E.	−9·8	96·7	324	e 13 52	+69	e 24 14	+48	—	—
Rome		−9·8	96·9	325	e 12 7	−37	—	—	—	—
Chicago		−9·9	98·4	36	—	—	i 22 29	−73	—	—
Ann Arbor		−9·9	100·0	32	17 2	PP	i 23 8	−49	—	—
Little Rock		−9·9	100·8	43	e 17 10	PP	i 22 42	−82	—	—
Ottawa		−9·9	101·0	26	e 17 9	PP	i 22 40	−86	e 30·2	—
Cincinnati		—	102·1	35	i 15 45	?	i 24 6	[−30]	e 40·6	—
Pittsburgh		—	103·2	31	—	—	i 24 2	[−39]	—	—
Tortosa	N.	—	103·5	331	e 17 23	PP	e 26 24	PS	—	55·5
East Machias		—	104·4	21	—	—	i 24 12	[−35]	—	—
Algiers		—	105·6	327	i 17 40	PP	i 31 52	?	—	—
Charlottesville		—	105·8	33	e 17 44	PP	e 23 3	[−111]	—	—
Georgetown		—	105·8	30	e 17 40	PP	i 27 7	?	e 38·2	—
Alicante		—	106·0	331	e 17 48	PP	e 27 31	?	e 36·5	—
Toledo		—	106·3	334	17 28	PP	23 5	[−111]	e 42·4	—
Columbia		—	107·8	36	—	—	e 23 14	[−109]	—	—
Almeria		—	108·1	331	—	—	e 32 19	SS	—	—
Granada		—	108·4	332	i 17 44k	PP	e 26 57	PS	40·8	71·2
Malaga		—	109·1	332	17 58	PP	26 43	?	41·6	46·3
San Fernando	N.	—	110·1	334	—	—	27 19	PS	—	65·2
San Juan		—	128·2	34	i 20 20	PP	i 26 20	?	—	—
Huancayo		—	143·1	76	i 18 34	[−53]	e 27 37	?	—	—
La Paz		—	151·3	76	e 18 50	[−53]	i 28 41	?	44·7	51·4
Sucre		—	154·8	79	i 18 19	[−89]	i 28 7	?	—	—
La Plata		—	161·6	123	—	—	(29 38)	?	29·6	—

For Notes see next page.

NOTES TO MARCH 11d. 19h. 32m. 46s.

Additional readings :—
Koti iS = +3m.50s., S_cS = +13m.52s. ; T_0 = 19h.32m.45s.
Kobe iE = +3m.49s. = SS − 1s., iE = S_cS? = +13m.50s.
Taikyu P_cS = +12m.31s.
Keizyo i = +4m.16s., e = +5m.23s., P_cS = +14m.4s.
Zinsen i = +3m.17s. = PP − 3s., iE = +5m.53s. = SS − 7s., iN = +5m.56s., P_cS = +14m.5s.
Zi-ka-wei iSE = +6m.24s., iE = +6m.28s. = SS + 6s.
Nanking iSNZ = +7m.3s., iZ = +10m.35s.
Hong Kong ? = +5m.51s., PP? = +6m.53s.
Amboina i = +7m.14s. = SS + 2s.
Medan i = +14m.46s.
Riverview iPPE = +18m.25s., iE = +20m.12s. = SS − 2s.
Adelaide iPP = +11m.8s., i = +20m.4s. and +24m.4s.
Bombay PS? = +18m.41s.
Melbourne i = +18m.51s. and +20m.47s.
Sitka i = +12m.18s., e = +14m.44s. and +18m.43s., i = +18m.54s. = PS − 35s. and +20m.50s.
Tiflis PPEZ = +12m.19s., eEZ = +13m.41s., ePPPE = +16m.31s., eE = +23m.11s. and +30m.2s.
Helsingfors ePPPN = +15m.52s., eN = +23m.30s., eSSN = +25m.30s.
Upsala iPP = +14m.36s., i = +24m.7s., and +26m.16s.
Tinemaha iZ = +14m.47s.
Copenhagen i = +13m.39s., +15m.16s., iS = +21m.35s.
Potsdam iP_cPEZ = +12m.5s., i_sPZ = +13m.48s., eNZ = +14m.44s. = PP − 17s., iPP = +15m.36s., eE = +16m.2s. = PPP − 39s., iPPPEZ = +17m.35s. = PPPP − 9s., ipPPPEZ = +19m.13s., iSKSEN = +21m.37s., eE = +21m.50s., iSN = +21m.56s., iSPEN = +22m.11s., epSEN = +22m.56s., iPSN = +23m.33s., eN = +24m.8s., e = +25m.2s., i_sSPEN = +25m.21s., eEN = +27m.32s., iSSEN = +28m.3s.
Hamburg iN = +21m.59s.
Prague PP = +15m.43s., eSS = +25m.38s.
Tucson ipP = +14m.0s., iPP = +15m.49s., iS = +21m.52s.
Vienna P_cP = +12m.29s., iN = +14m.53s. = PP − 18s., PP = +15m.43s., PPP = +17m.31s. = PPPP − 36s., iE = +18m.30s., S_cS = +22m.27s., PS = +22m.45s., i = +25m.14s., PKKP = +31m.2s.
Jena eN = +21m.41s., eE = +21m.44s., eN = +25m.14s., and +28m.14s.
Cheb e = +21m.47s. and +28m.34s.
Göttingen iZ = +13m.56s. and +15m.48s., eEN = +25m.32s., e = +28m.20s.
Georgetown iP = +17m.47s., i = +18m.3s., and +23m.51s.
Edinburgh i = +22m.30s., +25m.49s., and +34m.50s.
Helwan i = +25m.30s.
De Bilt iZ = +14m.6s. and +16m.2s., eEN = +22m.24s.
Durham ? = +25m.54s. and +28m.54s.
Stuttgart sP = +14m.10s., ipPP = +16m.6s., e = +17m.20s. and +19m.48s., ePS = +22m.30s., e = +26m.3s., eEN = +29m.1s.
Triest i = +16m.7s., iPS = +22m.33s., iSS = +26m.57s.
Uccle iZ = +14m.12s. and +16m.12s., iPS = +22m.35s., iZ = +23m.56s., e = +25m.14s. ?
Strasbourg ipP = +14m.14s., iPP = +16m.17s., PPP = +18m.20s., iSKS = +22m.5s., esS = +26m.14s., SS = +29m.17s.
Bidston i = +22m.49s., +24m.7s., and +29m.20s.
Kew iZ = +14m.16s., iPP = +16m.19s., eSKSEN = +22m.7s., iZ = +24m.9s., eE = +26m.11s., iSSE = +29m.27s.
Oxford S = +22m.46s.
Florence PS = +23m.54s.
Paris PP = +16m.27s.
Madison isS = +23m.2s. = SKS − 67s., eSS = +24m.21s.
Chicago iSP = +24m.53s.
Ann Arbor i = +22m.32s., e = +25m.8s., eE = +26m.8s. = PS − 37s.
Ottawa e = +23m.16s., eE = +23m.40s. = SKS − 51s., e = +25m.16s.
Cincinnati iZ = +15m.51s., iE = +15m.58s., iZ = +16m.7s. = PP − 36s., iEN = +21m.27s., iE = +22m.7s., iN = +22m.11s., iEN = +22m.35s., iZ = +24m.14s. and +27m.29s.
Pittsburgh eSS = +31m.20s., e = +36m.16s.
Tortosa ePE = +17m.26s.
East Machias iSKS = +22m.57s., esS = +29m.14s.?
Algiers e = +36m.17s.
Charlottesville e = +23m.53s., eSS = +32m.14s.
Georgetown iP = +17m.47s., i = +18m.4s. and +23m.51s.
Columbia e = +24m.8s., eSP = +26m.8s.
Malaga PP = +20m.8s., PPP = +22m.4s., i = +24m.37s., PS = +27m.33s., SS = +32m.35s.
San Juan e = +24m.59s., +29m.26s., +32m.54s., and +36m.59s.
Huancayo e = +21m.8s., i = +21m.27s.
La Paz sP = +21m.8s., PPN = +21m.59s., PPP = +23m.26s., SPN = +29m.10s., sS = +32m.8s., L_q = +42·1m.
Long waves were recorded at Kucino.

March 11d. Local shocks from the neighbourhood of the epicentre of the large earthquake of 2d. were recorded at Mizusawa as follows :—

P.			S.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.
e 4	18	56	e 4	19	27	e 14	0	47
			e 10	28	19	e 16	47	43
e 11	52	33	e 11	52	58	e 23	20	29
			e 13	42	37			

March 11d. Readings also at 2h. (Branner (3) and Lick (4)), 3h. (Ann Arbor, Tucson (2), St. Louis, Berkeley (2), Branner (4), and Lick (6)), 4h. (Ann Arbor (2), Tucson, Chicago, Berkeley, Branner, and Lick), 5h. (Ann Arbor (2), Chicago (2), St. Louis (2), Charlottesville, Tucson (2), Ukiah (2), Bozeman (2), Berkeley (2), Branner (2), Lick (3), Pasadena (2), near Soengei Langka, Batavia, and Malabar), 6h. (Ekaterinburg, Pasadena, Tucson (3), Berkeley (3), Branner (2), and Lick (4)), 7h. (Bozeman, Charlottesville, Ann Arbor, Pittsburgh, Chicago, St. Louis, Ukiah, Lick, Seattle, Tucson, Ekaterinburg, Chiufeng, Tashkent, Copenhagen, Adelaide, Melbourne, and Nagoya), 8h. (Pasadena, Berkeley, Branner (3), Lick (5), Tucson (4), Ukiah, St. Louis, Baku, Tiflis, De Bilt, Paris, Montezuma, and La Paz), 9h. (Berkeley, Branner, Lick (2), Ukiah, Tucson, Charlottesville, Chicago (2), Bozeman (2), Pittsburgh, and near Algiers), 10h. (Lick (3)), 11h. (Branner (2), Lick (5), Tucson (5), Seatoun, and Wellington), 12h. (Berkeley, Branner, Lick, Tucson, Edinburgh, Almata, near Andijan, and Tchimkent), 13h. (Berkeley, Branner, Lick (2), and Tucson), 14h. (Berkeley (2), Branner (2), Lick (3), Ukiah, and Tucson (3)), 15h. (Berkeley, Branner, Lick, and Tucson), 16h. (Branner (2), Lick, Tucson, and San Juan), 17h. (Bozeman, Seatoun, and near Wellington (2)), 18h. (Baku, Ekaterinburg, Tashkent, Tiflis, Almata, Andijan, Tchimkent, Samarkand, and Ksara), 19h. (Tyosi), 21h. (Andijan), 22h. (Lick (3), Tucson (3), and Samarkand), 23h. (Lick and Tucson).

March 12d. 4h. 25m. 50s. Epicentre 15°·0N. 87°·5W. N.3.

A = + ·042, B = − ·965, C = + ·259 ; D = − ·999, E = − ·044 ;
G = + ·011, H = − ·259, K = − ·966.

	Δ	Az.	P.	O − C.	S.	O − C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Columbia	19·9	16	e 4 16	−13	e 8 10	+ 6	—
Little Rock	20·2	348	e 4 33	+ 1	e 8 10	0	—
San Juan	20·7	78	e 4 33	− 4	e 8 12	− 8	10·5
Florissant	23·9	354	e 5 11	+ 2	e 9 26	+ 5	—
Georgetown	25·6	21	i 5 29	+ 4	9 47	− 4	e 11·2
Tucson	27·4	313	e 6 28	PP	e 10 53	+31	e 16·9

Long waves were also recorded at Pittsburgh and East Machias.

March 12d. 5h. 6m. 0s. Epicentre 39°·7N. 143°·7E. (as on 3d. 15h.). X.

A = − ·620, B = + ·455, C = + ·639 ; D = + ·592, E = + ·806 ;
G = − ·515, H = + ·378, K = − ·769.

	Δ	Az.	P.	O − C.	S.	O − C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	2·1	254	0 31	+ 1	e 1 9	S_e	—	—
Tyosi	4·6	210	e 1 5	− 1	1 53	− 5	—	3·2
Nagoya	7·2	233	e 1 46	+ 4	3 13	+ 9	—	3·8
Osaka	8·3	235	1 39	−19	3 32	+ 1	—	5·4
Kobe	8·5	237	—	—	e 3 13	−23	—	5·4
Sumoto	8·8	235	e 1 13	−52	e 4 27	S*	—	—
Vladivostok	9·4	295	i 2 6	− 7	4 0	+ 1	4·7	6·0
Keizyo	13·2	266	e 3 8	+ 3	e 5 35	+ 3	e 6·7	—
Chiufeng	21·1	280	e 4 29	−12	e 8 31	+ 3	—	13·1
Ekaterinburg	54·1	319	9 25	+ 3	e 17 5	+ 8	28·4	35·7
Baku	68·0	306	—	—	e 22 39	?	e 34·0	43·7

Additional readings :—
Kobe eE = +3m.51s., eZ = +3m.54s.
Sumoto eN = +1m.20s., e = +4m.51s. = S_e +6s.
Long waves were also recorded at Zinsen, Tucson, Hong Kong, Tashkent, Tiflis, and other European stations.

March 12d. 7h. 38m. 8s. Epicentre 33°·8N. 132°·5E. (as on 8d.). X.

A = −·561, B = +·613, C = +·556; D = +·737, E = +·676; G = −·376, H = +·410, K = −·831.

	△	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Koti	0·9	106	i 0 7a	− 6	0 19	− 4	—
Sumoto	2·1	74	e 0 25	− 5	e 0 53	− 1	1·0
Kobe	2·4	68	e 0 35	+ 1	1 6	+ 5	1·3
Nagasaki	2·4	244	0 33	− 1	—	—	—
Osaka	2·7	71	0 43	+ 4	1 19	S*	2·1
Toyooka	2·7	48	i 0 39	0	i 1 7	− 2	1·3
Nagoya	4·0	69	e 0 57	0	2 1	S*	—

Additional readings :—
Sumoto SEZ? = +37s. = P_g +1s., SN? = +41s.
Kobe iN = +48s. = P_g +6s.

March 12d. 20h. 44m. 15s. Epicentre 33°·6N. 118°·0W. (as on 11d.). X.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Lick	N.	4·8	323	e 1 6	− 2	i 1 57	− 6
Branner		5·1	320	e 1 13	0	—	—
Berkeley		5·5	322	e 1 17	− 1	e 2 3	−17
San Francisco		5·5	320	e 1 21	+ 3	—	—
Tucson		6·2	100	—	—	e 3 15	S_g
Ukiah		7·0	324	e 2 27	S	e 2 44	−15

Additional readings :—
Lick iN = +1m.15s. = P* −4s.
Tucson e = +3m.58s., i = +4m.53s., and +5m.6s.

March 12d. Shocks presumably from the neighbourhood of the epicentre of 2d. were recorded at Japanese stations as follows :—

Mizusawa.											
P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 0	38	39	e 10	20	0	e 10	20	29
			0	42	23				e 13	43	42
e 0	41	53							e 14	8	47
e 2	36	19	e 2	36	46	e 14	8	28	e 16	19	17
e 3	27	52	e 3	28	29				e 16	20	40
			e 4	38	44				e 17	45	51
e 5	54	28	e 5	55	1				e 22	27	2
e 8	45	22	e 8	45	43						
Tyosi.											
e 0	42	25	0	43	16				8	47	10
			3	29	18				22	26	2

March 12d. Readings also at 0h. (Branner, Lick (2), Tucson, Vladivostok, Chiufeng, Hong Kong, Phu-Lien, Tashkent, Calcutta, Medan, Baku, Tiflis, Ekaterinburg, and Copenhagen), 5h. (Lick, Stuttgart, Hohenheim, and near Malabar), 6h. (Lick (2) and Tucson (2), 7h. (near Balboa Heights), 8h. (Tucson and near Tyosi), 12h. (New Plymouth), 13h. (La Paz and near Sumoto) 14h. (Tchimkent, Andijan, and near Samarkand), 15h. (De Bilt, Stuttgart, Tiflis, Lick, and near Athens), 22h. (near Nagoya, Kobe, and Osaka), 23h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Lick, Tucson, and La Paz).

March 13d. 7h. 15m. 5s. Epicentre 35°·5N. 142°·5E. (as on 1932 June 24d.). X.

A = −·646, B = +·496, C = +·581 ; D = +·609, E = +·793 ;
G = −·461, H = +·354, K = −·814.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		1·3	280	i 0 17	− 1	0 33	0	—	0·9
Mizusawa		3·8	338	e 0 55	+ 1	e 1 34	− 3	—	—
Nagoya		4·5	267	e 1 18	P*	2 14	S*	—	3·0
Osaka		5·8	263	1 23	+ 1	2 32	+ 4	—	3·9
Kobe		6·1	264	—	—	e 3 18	S_g	—	4·4
Sumoto		6·3	261	1 46	P*	e 3 46	?	—	4·8
Koti	E.	7·6	258	—	—	(2 55?)	−19	2·9?	—
Vladivostok		11·1	316	2 23	−13	e 4 32	− 9	5·1	7·3
Zi-ka-wei	Z.	18·1	262	e 4 5	− 3	7 31	+ 4	11·3	14·0
Nanking		20·0	267	e 4 53	+23	—	—	e 14·2	—
Chiufeng		21·2	290	e 4 39	− 3	e 8 28	− 2	—	14·0
Tashkent		56·0	300	e 8 55?	−41	e 20 55?	SS	—	37·5
Ekaterinburg		56·7	320	—	—	e 17 36	+ 4	28·9	—
Wellington		82·3	157	17 55?	?	—	—	—	—

Additional readings :—
Tyosi P_g = +22s.
Mizusawa eSN = +1m.41s.
Sumoto eZ = +2m.41s. =S −2s., eN = +2m.49s.
Tashkent e = +27m.7s.
Long waves were also recorded at Hong Kong, Tiflis, Baku, Pulkovo, and other European stations.

March 13d. 13h. 17m. 57s. Epicentre 36°·5N. 118°·0W. (as on 1921 Nov. 17d.). X.

A = −·377, B = −·710, C = +·595 ; D = −·883, E = +·470 ;
G = −·279, H = −·525, K = −·804.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Pasadena		2·4	183	i 0 42	P_g	—	—	—
Lick	N.	3·0	287	e 0 45	+ 2	—	—	—
Branner		3·5	288	e 0 51	+ 1	—	—	—
Berkeley		3·7	294	e 0 57	+ 4	—	—	—
Tucson		7·3	123	e 1 41	− 3	i 2 57	− 9	—
Florissant		21·9	75	e 4 36	−14	e 8 22	−22	13·6
St. Louis	E.	22·0	76	e 3 52	−59	e 8 5	−41	—

Additional readings :—
Berkeley eP = +1m.19s.
Tucson e = +2m.21s. =P_g −1s. and +2m.44s.
Long waves were also recorded at De Bilt, Edinburgh, and other American stations.

March 13d. 15h. 57m. 4s. Epicentre 39°·1N. 145°·2E. (as on 3d.). X.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Mizusawa	3·1	271	i 0 45	+ 1	i 1 15	− 5	—
Tyosi	4·7	227	e 1 8	0	1 56	− 7	—
Nagoya	7·6	242	e 1 54	+ 6	e 3 44	S*	—
Vladivostok	10·8	296	2 22	−10	e 3 22	−71	4·1
Chiufeng	22·3	282	—	—	e 8 33	−19	—

Additional readings :—
Mizusawa ePN = +48s. =P* −2s.
Long waves were also recorded at Baku and Ekaterinburg.

March 13d.
Shocks from the neighbourhood of the great earthquake of March 2d. 17h. were recorded at Mizusawa and Tyosi as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 2	48	38	e 16	57	28	e 16	57	59
			e 6	56	22	e 13	37	42	e 17	38	8
e 9	29	41	e 9	30	12				e 18	42	45
e 12	32	23	i 12	32	52	i 21	3	59	e 21	4	12
e 12	38	51	i 12	39	20				e 23	18	37
			e 13	21	44						
Tyosi.											
e 17	38	27	17	39	14	e 23	17	49	23	18	27
			21	5	19						

March 13d. Readings also at 1h. (near Mizusawa), 4h. (Lick and Tucson), 6h. (Lick and near Almeria), 7h. (La Paz), 9h. (Kobe and near Sumoto), 11h. (Nagoya), 13h. (Florissant and Camerino), 14h. (near Athens), 16h. (Adelaide, Melbourne, Riverview, Sydney, Suva, New Plymouth, Arapuni, Wellington, St. Louis, Little Rock, Ekaterinburg, Pulkovo, Tiflis, Strasbourg, Chur, Neuchatel, Zurich, near Marseilles, and Puy de Dôme), 17h. (Perth, Huancayo, East Machias, Baku, Ekaterinburg, and Tashkent (2), 18h. (Ekaterinburg, Tashkent, Ksara, De Bilt, Paris, Strasbourg, Stuttgart, and Granada), 19h. (Lick), 20h. (La Paz), 21h. (Huancayo and near Algiers), 22h. (Wellington and near Christchurch), 23h. (near Tananarive).

March 14d. 1h. 19m. 39s. Epicentre 38°·4N. 25°·3E. N.1.

Probable error of epicentre ±0°·19.

A = +·708, B = +·335, C = +·621 ; D = +·427, E = −·904 ;
G = +·562, H = +·265, K = −·784.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		1·3	251	i 0 24a	P_g	—	—	i 0·7	0·8
Trenta		7·0	280	e 1 41	+ 2	2 31	−28	—	—
Bari		7·1	296	2 55	+74	4 4	+63	5·3	—
Belgrade		7·4	333	e 1 42a	− 3	e 3 42	S*	—	5·4
Catania		8·1	267	e 4 19	S_g	—	—	—	—
Naples	N.	8·8	290	e 2 14	+ 9	e 5 34	?	—	10·9
Yalta		9·0	45	2 3	− 4	—	—	—	—
Simferopol		9·3	43	2 5	− 6	(3 39)	−17	3·7	—
Ksara		9·7	114	e 2 33?	+16	—	—	—	7·9
Helwan		9·9	148	e 1 41	−38	i 4 4	− 7	—	12·3
Theodosia		10·0	45	2 23	+ 2	—	—	—	—
Budapest		10·1	335	2 23	+ 1	5 0	S*	5·3	—
Zagreb		10·1	320	e 1 41	−41	e 4 54	S*	—	5·9
Rome		10·4	294	e 2 27	+ 1	—	—	—	—
Laibach		11·0	317	e 2 40	+ 5	e 5 56	S_g	—	7·1
Triest		11·2	314	2 34	− 3	e 4 44	+ 1	—	7·0
Lemberg		11·5	356	2 39	− 3	—	—	—	8·1
Florence		11·8	302	i 2 47	+ 1	4 57	− 1	—	6·8
Vienna		11·8	330	e 2 40	− 6	i 4 46	−12	—	8·9
Venice		11·9	310	e 2 41?	− 6	6 34	S_g	—	9·4
Prato		12·0	302	e 2 45	− 3	5 37	S*	7·0	8·4
Treviso		12·1	311	e 2 25	−25	i 6 40	S_g	—	6·9
Padova		12·2	309	e 2 59	+ 8	e 6 53	S_g	—	—
Piacenza		13·4	305	3 15	+ 8	6 1	+24	8·0	9·7
Chur		14·3	313	e 3 17	− 2	—	—	—	—
Cheb		14·8	326	e 3 24	− 2	e 6 27	+17	e 7·3	8·3
Tiflis		15·2	71	3 36	+ 5	e 6 41	+21	8·5	11·1
Zurich		15·4	312	e 3 29	− 5	—	—	—	—
Stuttgart		15·6	317	e 3 31	− 5	e 6 21	− 8	e 7·9	10·0
Jena		15·8	327	i 3 40	+ 1	—	—	e 7·4	8·9

Continued on next page.

	Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Neuchatel	15·9	309	e 3 38	− 2	e 6 33	− 3	—	—
Karlsruhe	16·1	316	3 43	0	—	—	e 8·7	—
Strasbourg	16·2	315	i 3 46a	+ 2	e 7 1	+18	e 8·9	10·2
Potsdam	16·3	332	3 45	0	i 6 49	+ 4	e 7·8	9·6
Göttingen	16·9	326	i 3 52	− 1	—	—	e 8·4	10·4
Algiers	17·7	273	i 4 2	− 1	—	—	—	—
Barcelona	18·0	287	e 4 5	− 2	e 14 11	?	—	—
Puy de Dôme	18·1	301	4 4	− 4	—	—	e 10·3	—
Hamburg	18·4	330	i 4 10a	− 1	e 7 21?	−12	—	14·8
Baku	19·0	76	i 4 24	+ 5	i 8 6	SS	9·9	12·4
Tortosa	19·2	285	i 4 22	+ 1	12 18	?	—	—
Copenhagen	19·3	338	4 20	− 2	7 55	+ 3	9·3	—
Uccle	19·3	317	i 4 20k	− 2	7 59	+ 7	—	—
Paris	19·4	310	i 4 22	− 1	—	—	10·4	10·4
De Bilt	19·5	321	i 4 24	0	8 4	+ 8	e 9·4	11·2
Alicante	20·2	278	e 4 34	+ 2	e 13 32	L	(e 13·5)	—
Pulkovo	21·6	9	i 4 43	− 3	8 36	− 2	11·4	13·1
Helsingfors	21·8	359	e 4 44	− 5	i 8 47	+ 5	—	—
Upsala	22·0	350	i 4 49	− 2	8 39	− 7	e 11·4	13·4
Kew	22·1	315	e 4 51	− 1	e 8 55	+ 7	10·4	12·8
Toledo	22·7	283	e 4 59	+ 1	e 13 3	L	(e 13·1)	—
Granada	22·8	276	i 4 54	− 5	e 9 4	+ 3	10·9	16·5
Oxford	22·8	315	4 57	− 2	9 7	+ 6	e 11·8	14·6
Malaga	23·5	275	i 4 55	−10	e 9 11	− 3	13·5	15·7
Stonyhurst	24·4	318	e 9 43	S	(e 9 43)	+13	(i 14·3)	—
Bidston	24·5	317	—	—	i 9 41	+ 9	e 12·6	14·0
San Fernando	25·0	275	5 47	PP	14 29	L	(14·5)	—
Bergen	25·3	333	—	—	e 10 51	SS	e 14·4	—
Edinburgh	25·8	322	e 5 47	+20	—	—	—	15·0
Ekaterinburg	29·6	40	e 6 1	0	10 54	− 4	14·4	19·4
Tashkent	33·5	70	e 8 8	?	e 11 54	− 4	e 17·4	20·9
Chiufeng	66·9	55	—	—	e 24 11	SS	—	—
Georgetown	74·9	308	20 50	?	30 4	?	e 41·3	—
Cincinnati	79·3	312	e 22 22	S	(e 22 22)	+14	46·2	—
San Juan	79·8	285	—	—	e 20 8	?	e 36·1	—
Sucre	102·1	255	e 19 51	?	27 33	PS	—	—
La Paz	102·8	259	i 20 10k	PPP	i 28 3	?	36·1	39·0
Huancayo	105·8	267	—	—	e 24 42	[−12]	e 41·8	—

Additional readings and note :—
Belgrade eNW = +1m.47s., eZ = +2m.14s., eNW = +3m.9s. =S +0s.
Triest i = +2m.42s., +2m.57s., +3m.46s., and +5m.16s., iSS = +5m.57s., iSSS = +6m.3s., i = +6m.14s.
Lemberg ePE = +2m.53s.
Vienna iE = +3m.44s. and +5m.15s., S = +6m.9s., SS = +6m.31s., SSS = +6m.39s.
Treviso PP = +5m.35s., SS = +8m.30s.
Tiflis eE = +7m.42s.
Zurich i = +3m.35s. =PP −3s.
Stuttgart iPP = +3m.40s., eSS = +6m.57s.
Potsdam iN = +3m.57s. =PP +6s., iE = +4m.8s. and +6m.43s., iE = +7m.45s., iN = +8m.2s.
Copenhagen +8m.8s.
Helsingfors eSSSN = +10m.10s. ; T_e = 1h.19m.7s.
Kew e = +9m.3s.
Malaga PP = +5m.30s., SS = +9m.59s.
Stonyhurst S is recorded as eP? and L as iS?
Tashkent e = +11m.41s. and +15m.33s.
Cincinnati i = +22m.36s. and +23m.37s.
San Juan iSS = +27m.51s., eSSS = +31m.11s.
Huancayo e = +29m.20s., eSS = +33m.31s., e = +35m.50s., eSSS = +37m.48s.
La Paz sP = +21m.26s., PP = +23m.8s., S_cS = +28m.35s., sS = +30m.53s., SS = +32m.32s.
Long waves were also recorded at Almeria, Durham, Kucino, Cape Town, La Plata, East Machias, Harvard, and Sitka.

March 14d. 1h. 30m. 22s. Epicentre 0°·5N. 16°·0W. N.3.

A = + ·961, B = − ·276, C = + ·009 ; D = − ·276, E = − ·961 ;
G = + ·008, H = − ·002, K = − 1·000.

		Δ	Az.	P.	O − C.	S.	O − C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Almeria		38·5	18	e 7 9	−10	—	—	e 19·5	20·7
Toledo		40·8	15	i 7 44	+ 5	(e 16 44)	SS	e 16·7	26·0
Tortosa	N.	43·0	19	e 9 39	PP	—	—	e 19·6	25·0
Neuchatel		50·6	21	e 8 53	− 3	—	—	—	—
Chur		51·5	22	e 8 59	− 4	e 11 56	?	—	—
Triest		52·2	27	i 9 4*k*	− 4	—	—	e 27·3	—
Kew		52·7	13	—	—	e 16 38?	0	e 19·6	—
Uccle		53·2	15	—	—	i 16 53	+ 8	e 21·6	—
De Bilt		54·6	16	i 9 29	+ 3	17 15	+11	e 24·6	30·1
Cheb		55·2	23	e 9 38?	+ 8	—	—	e 25·6	30·1
Edinburgh		56·4	9	—	—	e 22 38?	?	—	30·6
Tiflis		68·3	45	10 59	− 1	19 53	− 8	e 35·2	—
Ekaterinburg		82·3	33	i 15 23	PP	e 22 38	− 2	38·6	44·7

Additional readings :—
Toledo i = +9m.15s. = PP + 7s.
Triest i = +9m.27s. and +11m.47s. = PPP − 10s.
Ekaterinburg e = +23m.18s. = PS + 0s.
Long waves were also recorded at Algiers, Helwan, Pulkovo, Vladivostok, and other European stations.

March 14d. 12h. 59m. 1s. Epicentre 37°·5N. 145°·0E. (as on 1930 May 23d.). X.

A = − ·650, B = + ·455, C = + ·609 ; D = + ·574, E = + ·819 ;
G = − ·499, H = + ·349, K = − ·793.

	Δ	Az.	P.	O − C.	S.	O − C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	3·4	299	e 0 51	+ 2	1 16	−11	—	—
Tyosi	3·7	242	e 0 50	− 3	1 38	+ 3	—	—
Nagoya	6·9	253	e 1 37	− 1	2 53	− 3	—	—
Osaka	8·2	252	2 1	+ 5	4 0	S*	—	5·0
Vladivostok	11·4	303	e 2 30	−10	—	—	5·5	6·7
Suva	63·9	144	—	—	e 18 23?	−43	—	—
Wellington	83·4	158	—	—	28 59?	SS	—	—

Additional readings :—
Tyosi iP = +1m.6s. = P_g − 2s.
Vladivostok e = +2m.47s. and +3m.17s.
Long waves were also recorded at Kobe, Chiufeng, Ekaterinburg, Baku, Tiflis, and Stuttgart.

March 14d. 16h. 4m. 50s. Epicentre 39°·1N. 144°·7E. (as on 4d.). X.

A = − ·633, B = + ·448, C = + ·631 ; D = + ·578, E = + ·816 ;
G = − ·515, H = + ·364, K = − ·776.

	Δ	Az.	P.	O − C.	S.	O − C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	2·8	271	i 0 38	− 2	i 1 6	− 6	—	—
Tyosi	4·6	221	i 1 7	+ 1	2 1	+ 3	—	—
Nagoya	7·3	240	e 1 57	+13	e 3 30	S*	—	—
Vladivostok	10·4	297	i 1 51	−35	e 4 4	−19	4·7	5·8
Chiufeng	22·0	282	e 8 45	S	(e 8 45)	− 1	12·4	—
Ekaterinburg	55·1	318	e 9 24	− 6	e 21 10	SS	28·2	—

Additional readings :—
Tyosi P_g = +1m.20s., S_g = +2m.20s.
Long waves were also recorded at Tashkent, Baku, and Tiflis.

March 14d. 19h. 1m. 55s. Epicentre 33°·6N. 118°·0W. R.2.
(given by Pasadena as 33°·37′N. 118°1′W., as on 12d.).

A = −·391, B = −·735, C = +·553 ; D = −·883, E = +·469 ; G = −·260, H = −·489, K = −·833.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Pasadena	0·6	346	i 0 6	− 3	—	—
Mount Wilson	0·6	356	i 0 8	− 1	—	—
Riverside	0·7	53	i 0 9	− 1	—	—
La Jolla	1·0	139	i 0 17	+ 3	—	—
Santa Barbara	1·7	301	i 0 26	+ 2	—	—
Haiwee	2·6	0	i 0 36	− 1	—	—
Lick	4·8	323	e 1 10	+ 2	—	—
Branner	5·1	320	e 1 15	+ 2	—	—
Berkeley	5·5	322	e 1 19	+ 1	—	—
Tucson	6·2	100	e 2 3	P_g	e 3 10	S*
Ukiah	7·0	324	—	—	e 3 35	S*

Tucson gives also i = +3m.17s. = S_g +2s.
Long waves were also recorded at Bozeman, Chicago, Ann Arbor, Cincinnati, Charlottesville, Pittsburgh, and East Machias.

March 14d. After-shocks from the neighbourhood of the great earthquake of March 2d. were recorded as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 1	23	35	e 1	24	12	e 14	26	52	e 14	27	22
e 4	4	13	e 4	4	47	e 22	50	31	i 22	51	6
4	28	16	4	28	38	e 23	35	51	e 23	36	21
e 7	18	52	e 7	19	23						

Tyosi eP 4 28 40, S 4 30 5.

March 14d. Readings also at 0h. (Lick and Tucson), 2h. (Calcutta), 5h. (Cincinnati and near Mizusawa), 6h. (near Algiers), 8h. (near Osaka, Kobe, and Sumoto), 11h. (near Tyosi), 12h. (Berkeley, Branner, Lick, and Tucson), 13h. (Vladivostok), 15h. (Tucson), 16h. (near Osaka, Kobe, and Sumoto), 17h. (Tyosi and near Mizusawa), 22h. (Lick), 23h. (Cincinnati, Huancayo, and La Paz).

March 15d. 4h. 58m. 39s. Epicentre 21°·5S. 170°·5W. (as on 1929 Oct. 7d.). X.

A = −·918, B = −·154, C = −·367 ; D = −·165, E = +·986 ; G = +·361, H = +·060, K = −·930.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		7·8	351	e 1 48	− 3	3 22	+ 3	—	4·9
Suva		11·0	286	3 21?	+46	5 41	+63	6·3	—
Wellington		23·4	209	e 7 15	+130	9 26	+14	10·9	—
Riverview		35·9	243	e 8 27	+90	—	—	e 13·5	17·0
Sydney		35·9	243	e 4 39	?	e 11 15	−80	16·6	17·3
Melbourne		41·6	238	—	—	e 16 51?	SS	i 20·0	23·2
Adelaide		46·3	243	e 13 56	?	i 17 54	SS	19·0	23·0
Berkeley		74·7	38	—	—	e 20 57	−20	—	—
Pasadena	z.	74·7	43	i 11 47	+ 8	—	—	—	—
Mount Wilson	z.	74·8	43	i 11 39	0	—	—	—	—
Ukiah		75·0	36	—	—	e 21 27	+ 7	e 31·3	—
Riverside	z.	75·1	43	i 11 41	0	—	—	—	—
Mizusawa		75·7	323	(e 11 16)	−28	e 11 16	P	—	—
Osaka		76·1	316	11 8	−39	—	—	—	—
Haiwee		76·1	42	i 11 46	− 1	—	—	—	—

Continued on next page.

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Tinemaha		76·5	41	i 11 51	+ 2	—	—	—	—
Sitka		84·0	19	—	—	e 22 57	− 1	e 49·0	—
Hong Kong		85·6	298	—	—	22 25	−49	—	44·8
Bozeman		86·2	38	—	—	e 22 21?	−58	—	—
Nanking		86·3	306	e 12 9	−31	e 21 45	?	—	—
Huancayo		90·4	104	e 23 23	SKS	(e 23 23)	[−12]	e 40·1	—
Phu-Lien		91·2	292	—	—	22 21?	?	—	—
Chiufeng		91·9	313	i 12 36a	−30	23 33	[−11]	—	—
Florissant		96·0	51	—	—	e 24 5	[− 1]	—	51·6
Ottawa		108·3	47	—	—	e 26 47	{+52}	e 57·3	—
Bombay		120·9	280	e 18 21	[−27]	e 29 21	SKSP	—	—
Tashkent		126·4	307	e 22 51	PPP	—	—	e 52·5	75·6
Ekaterinburg		128·8	327	e 18 44	[−21]	e 28 56	{+42}	52·3	72·2
Pulkovo		139·0	344	—	—	e 34 6	?	73·3	79·4
Baku		141·0	309	e 21 55	PP	e 30 7	{+37}	65·3	97·5
Tiflis	E.	144·2	313	e 22 0	PP	e 29 12	{−37}	e 56·4	—
Hamburg		147·9	0	e 19 21	[−18]	—	—	e 84·3	—
Potsdam		149·0	356	e 19 21	[−19]	—	—	e 84·3	94·3
Simferopol		149·1	324	e 19 23	[−17]	—	—	—	—
De Bilt		149·2	5	e 19 31	[− 9]	—	—	e 82·3	91·6
Yalta		149·3	324	19 24	[−17]	—	—	—	—
Sebastopol		149·6	326	e 19 26	[−15]	—	—	—	—
Uccle		150·4	7	e 19 35	[− 7]	—	—	—	91·3
Paris		152·1	10	e 20 21?	[+37]	—	—	81·4	100·4
Vienna	Z.	152·7	350	e 19 35	[−10]	—	—	—	—
Stuttgart		152·8	1	e 19 27	[−19]	—	—	e 85·3	93·3
Strasbourg		152·9	3	e 20 51?	[+65]	—	—	e 55·4	—
Triest		155·6	353	e 19 26	[−23]	e 30 32	{−22}	e 69·3	89·3
Piacenza		156·4	0	—	—	e 38 21	?	—	102·0
Florence		157·7	357	—	—	43 51	SS	85·3	89·3
Toledo		158·3	29	(e 26 51?)	PPP	—	—	e 26·8	—
Granada		160·7	33	e 20 39	{− 8}	—	—	83·7	90·3

Additional readings :—
Osaka e = +13m.16s.
Huancayo P = +23m.39s., e = +26m.24s., +30m.5s., +30m.44s., and +37m.24s.
Ottawa eE = +28m.21s. = PS + 10s., eN = +34m.33s., eE = +41m.21s., eN = +50m.45s.
Ekaterinburg e = +20m.24s., +22m.2s., +25m.58s. = SKS − 18s., and +27m.40s.
Pulkovo e = +40m.41s. = SS + 11s.
Baku e = +35m.39s., +43m.48s., and +47m.45s.
Tiflis ePKSE = +22m.56s., ePPPE = +24m.45s., ePSE = +33m.37s.
Potsdam eEN = +19m.39s. = PKP − 1s.
Stuttgart e = +24m.39s., +43m.51s., and +48m.21s. ?
Strasbourg ePP = +24m.36s. ?
Triest iPP? = +23m.33s.
Long waves were also recorded at Perth, Honolulu T.H., Vladivostok, Kucino, La Plata, San Juan, and other American and European stations.

March 15d. After-shocks apparently from origins near that of the great shock of March 2nd were recorded at Japanese stations as follows :—

Mizusawa.

P. h.	m.	s.	S. h.	m.	s.	P. h.	m.	s.	S. h.	m.	s.
e 0	42	0	e 0	42	31	i 17	32	2	e 17	32	28
			e 1	52	50				e 20	7	57
			e 2	28	21	e 22	59	6	i 22	59	42
			e 8	17	1						

Tyosi.

P.			S.			S.		
			2	13	24	23	0	35
e 17	32	27	17	33	27			

Nagoya.

P. h.	m.	s.	S. h.	m.	s.
e 17	33	17	e 17	34	46

March 15d. Readings also at 0h. and 2h. (Lick), 5h. (La Paz, Sucre, Vladivostok, and near Granada), 6h. (Mizusawa), 7h. (La Paz, Sucre, and Montezuma), 11h. (Berkeley, Branner, Lick, Bozeman, Ukiah, Pasadena, Tucson, Florissant, St. Louis, and Chicago), 12h. (Camerino), 15h. (La Plata and Wellington), 16h. (Chiufeng, Berkeley, Branner, Lick, Ukiah, and Tucson), 17h. (Ekaterinburg, Tiflis, Tashkent, Phu-Lien, Hong Kong, and Manila), 18h. (Stuttgart), 19h. (Granada, Mizusawa, near Nagoya, and Tyosi), 20h. (near Samarkand), 23h. (Pittsburgh, St. Louis, Tucson, Mount Wilson, Pasadena, Riverside, Tinemaha, and Haiwee).

March 16d. After-shocks of the 2d. shock were recorded at Japanese stations as follows :—

Mizusawa.

P.			S.		
h.	m.	s.	h.	m.	s.
			e 1	32	51
e 3	28	33	e 3	28	57
i 8	52	26	i 8	52	57
e 9	5	11	e 9	5	36

P.			S.		
h.	m.	s.	h.	m.	s.
e 9	16	23	e 9	16	45
e 10	15	22	e 10	15	55
			13	54	36

Tyosi.

P.			S.		
h.	m.	s.	h.	m.	s.
e 9	5	57	9	7	0

Nagoya.

P.			S.		
h.	m.	s.	h.	m.	s.
e 9	6	46	9	8	15

March 16d. Readings also at 0h. and 1h. (Lick), 5h. (Arapuni), 7h. (Chatham Islands), 9h. (Tyosi, Chiufeng, Vladivostok, Ekaterinburg, Baku, and Tashkent), 11h. (Florence, Camerino, Rome, near Prato, and near Amboina), 13h. and 15h. (Lick), 16h. (Berkeley and Lick), 19h. (New Plymouth (2), Arapuni, and near Wellington (2)), 20h. (2) and 21h. (Wellington), 22h. (near Algiers).

March 17d. 15h. 55m. 30s. Epicentre 54°·8N. 161°·7E. N.1.

Probable error of epicentre ±0°·22.

A = −·547, B = +·181, C = +·817 ; D = +·314, E = +·949 ;
G = −·776, H = +·257, K = −·576.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sikka		12·7	252	i 4 15	S	(i 4 15)	−65	7·8	9·2
Ootomari		14·4	243	3 26	+ 5	6 20	+19	9·5	—
Aomori		19·7	233	4 29	+ 3	7 59	− 1	—	—
Morioka		20·4	231	4 30	− 4	8 24	+10	—	—
Mizusawa		20·9	230	4 38	− 1	e 8 32	+ 8	10·8	—
Sendai		21·8	229	4 48	− 1	8 48	+ 6	—	—
Vladivostok		22·5	251	i 4 54	− 2	9 20	SS	10·7	13·5
Kakioka		23·7	227	5 6	− 1	9 17	− 1	—	—
Tyosi		23·9	226	e 5 9	0	(9 28)	+ 7	9·5	—
Maebasi		24·2	229	5 10	− 2	9 29	+ 2	—	—
Misima		25·2	228	5 23	+ 1	9 45	+ 1	—	—
Omaesaki		25·9	228	5 31	+ 3	10 2	+ 5	—	—
Nagoya		26·0	231	5 30	+ 1	10 19	+21	—	—
Kyoto		26·7	233	5 35	0	10 20	+10	—	—
Toyooka	E.	26·7	235	i 5 43	+ 8	e 10 20	+10	i 15·1	—
	N.	26·7	235	i 5 45	+10	i 11 7	+57	e 13·9	—
	Z.	26·7	235	i 5 36	+ 1	—	—	—	—
Osaka		27·1	233	5 38	− 1	10 33	+16	14·8	—
Kobe		27·3	233	e 5 40	− 1	e 10 17	− 3	e 12·5	16·4
Sumoto		27·7	233	5 43	− 1	10 26	− 1	15·1	16·7
Heizyo		28·7	252	e 5 59	+ 6	e 10 53	+10	15·8	—
Koti		28·9	234	e 5 55	0	e 9 43	−64	—	—
Keizyo		29·1	248	5 53	− 4	10 48	− 2	12·6	22·0
Zinsen		29·3	248	6 11	+12	11 12	+19	13·0	—

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taikyu		29·5	244	e 7 53	?	—	—	17·4	—
Hukuoka		30·5	239	e 5 48	−21	11 8	− 4	—	—
Hukuoka	B.	30·5	239	6 11	+ 2	11 7	− 5	—	—
Dairen		31·1	256	6 24	+ 9	—	—	—	—
Miyazaki		31·3	235	6 17	0	11 19	− 5	—	—
Nagasaki		31·4	238	6 18	+ 1	11 25	− 1	14·8	—
Chiufeng		33·4	264	i 6 31a	− 4	i 13 15	?	e 17·2	21·7
Sitka		34·1	60	i 6 44	+ 3	i 12 12	+ 4	16·5	—
Zi-ka-wei	Z.	36·9	247	i 7 2a	− 4	13 10	+20	19·2	21·7
Nanking		37·7	251	e 7 10	− 2	13 1	− 1	18·3	22·6
Naha		37·9	235	7 14	0	12 58	− 7	—	—
Victoria		44·7	65	8 14	+ 4	14 48	+ 2	22·7	23·9
Honolulu T.H.		45·2	121	e 8 32	+18	i 14 53	− 1	e 19·5	—
Seattle		45·8	66	e 7 42	−37	e 15 10	+ 8	—	—
Hong Kong		47·9	247	8 32	− 3	15 26	− 5	23·0	30·3
Ukiah		50·9	75	e 9 0	+ 2	16 19	+ 6	e 21·5	—
Manila		51·1	234	9 18	+18	16 29	+13	25·5	29·5
Ekaterinburg		51·4	317	i 9 4	+ 2	i 16 21	+ 1	30·7	32·7
Palau		52·2	215	9 5	− 3	16 25	− 6	—	—
Berkeley		52·3	76	e 9 9	0	i 16 37	+ 4	—	—
Bozeman		52·8	61	e 9 6	− 6	i 16 45	+ 6	24·4	—
Lick		53·0	76	e 9 15	+ 1	—	—	—	—
Phu-Lien		53·2	253	e 9 14	− 1	16 38	− 7	25·5	—
Almata		53·3	295	e 9 21	+ 5	—	—	29·5	—
Tinemaha		55·1	74	i 9 29	− 1	—	—	—	—
Haiwee		55·9	74	i 9 37	+ 2	i 17 26	+ 5	—	—
Santa Barbara		56·2	77	i 9 40	+ 3	—	—	—	—
Pasadena		57·3	76	i 9 44	− 1	i 17 42	+ 2	e 27·2	—
Mount Wilson		57·3	76	i 9 44	− 1	e 17 41	+ 1	—	—
Andijan		57·4	296	e 9 39	− 7	18 3	+21	29·5	—
Tchimkent		57·7	299	e 10 2	+14	—	—	31·5	—
Riverside		57·9	76	i 9 48	− 2	e 17 49	+ 1	—	—
Tashkent		58·6	298	i 9 54	− 1	—	—	—	42·4
La Jolla		58·7	76	i 9 57	+ 2	i 18 3	+ 4	—	—
Pulkovo		59·1	334	i 9 58	0	18 2	− 2	28·5	38·7
Helsingfors	E.	60·0	337	e 9 59	− 5	i 18 16	0	e 25·0	—
	N.	60·0	337	e 10 3	− 1	e 18 13	− 3	e 25·0	—
Kucino		60·3	327	i 10 3	− 4	18 16	− 4	29·1	38·3
Ivigtut		61·6	16	i 10 16	0	18 36	− 1	28·5	—
Upsala		61·8	341	i 10 17	0	18 35	− 4	e 29·5	39·6
Dehra Dun		62·1	283	10 20	+ 1	19 20	+37	33·3	39·5
Calcutta		62·2	270	10 7	−13	19 7	+22	35·6	40·5
Tucson		62·7	72	e 10 26	+ 3	i 18 56	+ 5	e 28·2	—
Bergen		63·3	347	—	—	e 17 44	−75	31·5	—
Agra	E.	64·6	281	10 29	− 7	19 4	−11	33·1	—
	N.	64·6	281	e 10 31	− 5	e 19 28	+13	—	—
Amboina		64·8	217	i 10 32	− 5	i 19 8	− 9	—	—
Madison		65·1	50	i 10 47	+ 8	i 19 18	− 3	—	—
Copenhagen		66·7	342	10 48	− 2	19 41	0	—	—
Chicago		66·8	50	10 46	− 5	19 38	− 4	e 31·5	—
Florissant		68·0	53	i 10 59	+ 1	i 19 57	0	e 31·6	36·1
Ann Arbor		68·1	47	e 10 54	− 5	i 20 6	+ 8	e 35·3	46·2
St. Louis		68·3	53	e 10 55	− 5	i 20 59	+58	e 33·0	39·5
Edinburgh		68·6	351	—	—	i 20 26	PS	—	—
Toronto		68·7	43	i 11 4	+ 1	i 20 1	− 4	32·5	—
Ottawa		68·7	39	e 11 0	− 3	e 19 59	− 6	e 32·5	—
Hamburg		69·1	343	i 11 6a	+ 1	e 20 12	+ 2	e 34·5	41·5
Buffalo		69·6	43	i 11 4	− 4	—	—	36·5	—
Tiflis		69·6	315	i 10 57	−11	i 20 14	− 2	35·8	46·9
Potsdam		69·7	340	i 11 7	− 2	20 17	− 1	34·5	42·5
Theodosia		70·3	322	11 12	− 1	20 25	0	30·5	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Stonyhurst		70·5	350	—	—	i 20 25	− 2	30·5	—
Simferopol		70·8	324	11 14	− 2	—	—	26·9	—
Bidston		71·0	351	—	—	i 20 36	+ 3	e 25·5	50·5
Liverpool		71·0	351	—	—	e 20 40	+ 7	—	—
Göttingen		71·1	342	i 11 16	− 1	e 20 24	−10	e 31·5	41·7
Yalta		71·2	323	11 16	− 2	20 33	− 2	29·5	—
Pittsburgh		71·2	45	—	—	i 20 30	− 5	e 28·5	—
Sebastopol		71·3	324	e 11 18	− 1	—	—	—	—
De Bilt		71·3	345	i 11 19	0	20 37	0	e 30·5	42·4
Jena		71·4	340	i 11 16	− 3	e 20 30	− 8	e 34·5	40·0
Prague		71·6	339	11 21	+ 1	e 20 44	+ 4	e 37·5	45·5
Medan		71·8	249	i 11 16	− 6	i 20 29	−14	e 39·5	—
Hyderabad		71·9	274	11 25	+ 3	20 40	− 4	33·3	46·7
Cheb		72·0	339	e 11 25	+ 2	e 20 44	− 1	e 35·5	45·5
East Machias		72·1	35	11 22	− 1	i 20 42	− 4	—	—
Feldberg	E.	72·6	342	e 11 29	+ 3	—	—	e 40·0	54·0
Kew		72·7	349	i 11 28	+ 1	e 21 6	+13	e 29·5	43·2
Uccle		72·7	346	e 11 26a	− 1	21 45	PS	34·5	—
Vienna		72·9	337	e 11 26a	− 2	20 59	+ 3	e 35·5	41·5
Budapest		73·0	334	11 28	− 1	20 53	− 4	e 35·5	44·5
Fordham		73·3	41	e 11 28	− 3	e 20 52	− 8	35·5	—
Georgetown		73·7	43	i 11 31	− 2	i 21 15	+10	e 33·5	—
Karlsruhe		73·8	343	11 30?	− 3	—	—	—	—
Stuttgart		73·9	342	i 11 34a	0	21 2	− 5	e 35·5	44·0
Charlottesville		73·9	45	e 11 32	− 2	21 4	− 3	e 36·5	—
Bombay		74·0	280	11 30	− 5	20 57	−11	37·8	47·5
Strasbourg		74·3	343	i 11 36a	0	e 22 15	?	e 34·5	—
Suva		74·4	164	—	—	19 30?	?	—	—
Paris		74·9	346	i 11 40	0	e 21 17	− 2	30·5	42·5
Belgrade		75·1	332	e 11 39a	− 2	e 21 14	− 7	e 31·6	—
Zurich		75·3	342	e 11 40	− 2	—	—	—	—
Zagreb		75·3	336	e 11 40	− 2	e 21 3	−21	e 36·5	—
Chur		75·6	341	e 11 45	+ 1	—	—	—	—
Triest		75·9	338	i 11 44a	− 1	i 21 22	− 8	e 36·8	44·4
Batavia		76·0	237	—	—	e 21 42	+10	—	—
Neuchatel		76·0	342	e 11 14	−32	—	—	—	—
Columbia		76·2	49	—	—	21 28	− 6	e 37·3	—
Treviso		76·3	339	i 11 48	0	21 34	− 1	43·5	51·5
Venice		76·5	339	i 11 52	+ 3	e 21 49	+12	—	—
Padova		76·6	339	e 11 54	+ 5	e 21 40	+ 2	—	—
Piacenza		77·3	340	11 58	+ 4	21 46	0	31·7	52·5
Pavia		77·4	341	11 59	+ 5	—	—	—	—
Prato		78·2	338	i 11 54	− 4	i 21 52	− 4	e 37·2	44·5
Florence		78·3	338	i 11 33	−26	22 13	PS	34·5	42·2
Kodaikanal		78·3	271	i 11 54	− 5	21 38	−19	35·7	50·7
Camerino		78·4	337	12 0	+ 1	—	—	—	—
Colombo		79·7	267	12 5	− 1	22 0	−12	36·9	47·2
Rome		79·8	337	i 12 7	0	e 22 12	− 2	—	—
Ksara		79·9	316	11 45	−22	21 55	−20	—	—
Athens		80·5	327	i 12 7k	− 3	22 10	−11	39·8	51·8
Trenta		81·4	333	i 12 5	−10	e 22 25	− 6	e 46·5	—
Barcelona		82·2	345	e 12 17	− 2	e 22 56	+17	e 38·0	48·2
Messina		82·6	334	12 20	− 1	21 20	−83	—	—
Tortosa		83·0	346	12 21	− 2	22 33	−14	39·5	47·6
Catania		83·3	334	e 12 23	− 2	—	—	e 47·8	56·0
Toledo		84·6	350	i 12 31	0	23 5	+ 1	e 39·9	53·4
Helwan		85·2	318	i 12 34	0	i 23 5	− 5	57·2	57·9
Tunis		85·2	337	i 12 35	+ 1	—	—	—	—
Alicante		85·6	346	e 12 34	− 2	e 23 8	− 6	e 45·6	—
Algiers		86·6	342	e 12 41	0	i 23 17	− 6	42·4	58·0

Continued on next page.

	Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Granada	87·2	348	i 12 38a	− 6	i 23 36	+ 7	41·3	62·1
Almeria	87·3	348	e 12 51	+ 6	e 23 25	− 5	e 49·9	—
Malaga	87·7	349	12 39	− 7	23 7	[−11]	43·0	44·3
San Fernando	88·2	351	12 33	−16	23 33	− 6	42·5	56·0
Riverview	89·1	189	e 12 42	−11	i 23 15	[−12]	e 36·5	49·5
Sydney	89·1	189	i 23 18	SKS	(i 23 18)	[− 9]	52·7	55·0
Adelaide	91·9	199	e 14 30	?	i 24 0	−14	37·2?	48·9
Arapuni	93·7	169	—	—	i 24 12	−18	46·5	49·5
Melbourne	93·7	193	—	—	i 24 17	−13	42·5	64·5
San Juan	96·3	45	e 13 36	+10	i 23 59	[− 9]	e 49·2	—
Wellington	96·8	170	—	—	e 23 51	[−19]	44·5	—
Huancayo	118·5	69	e 20 6	PP	e 25 38	[− 8]	e 50·3	—
La Paz	126·0	65	i 18 58	[− 1]	26 12	[+ 4]	65·7	78·5
Sucre	129·6	64	19 9	[+ 3]	—	—	68·5	—
La Plata	146·2	70	19 35	[− 1]	—	—	71·5	—

Additional readings :—
Vladivostok PP = +5m.34s., i = +7m.16s. and +7m.56s., SS = +9m.48s.
Kobe PPN = +6m.48s., PPP = +7m.12s.
Sumoto eSZ = +10m.39s.
Zinsen P_cP = +9m.13s., P_cS = +12m.10s., S_cS = +15m.43s.
Chiufeng i = +7m.57s., iPP = +8m.13s., i = +14m.40s.
Sitka iPP = +8m.14s., i = +8m.39s., e = +11m.55s., iSS = +14m.40s.
Zi-ka-wei iZ = +9m.28s. = P_cP − 4s., SSZ = +16m.10s.
Nanking iZ = +8m.46s. = PP +13s., iN = +17m.19s. = S_cS − 9s.
Victoria SN = +14m.51s. ; T_0 = 15h.55m.43s.
Honolulu T.H. e = +18m.18s. = S_cS + 5s.
Seattle eSS = +18m.30s. = S_cS + 13s.
Ekaterinburg L_q = +27m.0s.
Bozeman SS = +20m.28s.
Pasadena iPKP, PKP = +39m.37s.
Helsingfors ePPPE = +14m.0s., ePPPN = +14m.3s., eS_cSN = +19m.57s., iSKSE = +20m.8s., eSSN = +22m.2s., eSSE = +22m.16s. ; T_0 = 15h.55m.9s.
Upsala SSN = +22m.53s.
Tucson SS = +23m.12s.
Madison iPS = +19m.36s., iS_cS = +20m.48s., iSS = +23m.54s. ; T_0 = 15h.55m.33s.
Copenhagen +13m.30s. = PP + 21s. and +20m.24s. = S_cS − 17s.
Chicago S = +19m.55s. = PS + 0s., eSS = +24m.26s.
Florissant iPEN = +11m.11s., iEN = +20m.14s. = PS + 3s., and +21m.10s. = S_cS + 20s. ; T_0 = 15h.55m.33s.
Ann Arbor eSS?E = +24m.24s., eSSS = +27m.48s. ; T_0 = 15h.55m.0s.
St. Louis iP = +11m.0s., eP_cPEN? = +11m.30s., ePPEN = +13m.24s., iPSEN = +21m.20s. = S_cS + 28s., ePPPSEN = +21m.36s., iEN = +21m.58s., eEN = +22m.13s., iS_cSN = +22m.27s., eE = +22m.47s., iE = +25m.21s., iSSEN = +25m.42s. ; T_0 = 15h.55m.31s.
Toronto iPPPPE = +16m.40s., SSN = +24m.46s., iSSSE = +28m.2s.
Ottawa ePPPN = +15m.16s., e = +24m.24s. = SS + 1s., eSSS = +27m.49s.
Hamburg ePPPNZ = +15m.30s., iPSN = +21m.0s.
Tiflis ePPZ = +13m.55s., PPPZ = +15m.26s., eSKKSE = +21m.47s., eSSE = +25m.5s.
Potsdam iP_cP = +11m.50s., iZ = +13m.14s., ePP = +13m.30s.?, iPPPZ = +15m.30s., iE = +15m.49s., iN = +16m.9s., iZ = +16m.16s., iN = +20m.31s. = PS − 3s., iE = +21m.24s., eEN = +25m.0s., eZ = +25m.30s.?, eSSSNZ = +28m.6s., iN = +29m.0s., eNZ = +31m.6s.
Bidston i = +24m.30s. = SS + 28s.
Göttingen eSSEN = +25m.24s.
Pittsburgh e = +24m.31s. = SS − 30s.
Jena iPEN = +11m.19s., eN = +21m.0s. = PS + 3s. and +25m.30s. = SS + 26s.
Medan i = +12m.36s., iN = +20m.50s. = PS − 12s.
East Machias i = +21m.1s. = PS − 5s., iSS = +25m.23s., e = +28m.30s. ?
Kew iSKSN = +21m.43s., eSPEZ = +21m.51s., eSSN = +25m.28s.
Vienna P_cP = +12m.5s., iN = +12m.39s., PP? = +15m.7s., PPP = +16m.10s.
Fordham e = +16m.2s. and +25m.32s. = SS + 0s.
Stuttgart iP_cPZ = +11m.52s., ePP = +14m.18s., ePPPN = +16m.12s., eS_cS = +21m.21s. = PS − 9s., eSKKS = +22m.8s., eSSN = +25m.42s., eZ = +27m.10s., eEZ = +30m.0s.
Belgrade e = +14m.48s. = PP + 27s.
Triest i = +21m.41s., iPS = +21m.54s., e = +27m.31s.
Batavia e = +19m.30s., i = +31m.20s. = SSSS + 12s.
Treviso PP = +12m.16s., PPP = +13m.2s., PPPP = +14m.0s.
Florence i = +11m.59s. and +14m.13s., SKS = +21m.52s. = S − 5s., PS = +23m.7s., iN = +27m.36s., iE = +29m.25s., iN = +30m.43s., iE = +31m.10s. and +33m.10s.

Continned on next page.

Toledo SKS = +22m.45s., PS = +23m.58s.
Helwan i = +24m.19s. =PS +25s.
Granada P_cP = +12m.54s., PP = +16m.21s., PPP = +18m.20s.
Malaga PP = +16m.37s., PS = +24m.2s., SSS = +33m.27s.
San Fernando PE = +12m.43s., PN = +12m.48s., SE = +23m.50s., SN = +23m.56s.
Sydney e = +22m.6s., iS = +31m.48s.
Arapuni e = +38m.48s.
San Juan eSS = +31m.2s.
Wellington i = +24m.44s. =S −14s., e = +35m.10s.
Huancayo e = +26m.59s., ePS = +29m.52s., SS = +36m.10s.
La Paz iPPZ = +20m.57s., PPPE = +24m.2s., SPN = +33m.2s., sSPN = +35m.0s., PSN = +36m.40s., iSSN = +38m.1s.
Long waves were also recorded at Cape Town, Tananarive, and Durham.

March 17d. 19h. 32m. 32s. Epicentre 6°·5N. 127°·0E. (as on 1927 June 14d.). R.1.

Probable error of epicentre ±0°·26.

A = −·598, B = +·793, C = +·113; D = +·799, E = +·602; G = −·068, H = +·090, K = −·994.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Palau		7·4	82	1 42	− 3	3 3	− 6	—	—
Manila		10·0	325	2 24a	+ 3	4 29	+16	5·6	6·8
Amboina		10·3	173	2 28	+ 3	i 4 9	−12	7·4	—
Hong Kong		20·1	323	4 28	− 3	8 18	+10	10·1	11·5
Batavia		23·8	238	i 5 4	− 4	9 21	+ 2	13·5	—
Phu-Lien		24·4	308	5 12	− 2	9 46	+16	11·5	15·1
Titizima		25·2	33	5 22	0	9 40	− 4	—	—
Zi-ka-wei	z.	25·3	349	i 5 18a	− 5	10 10	+24	12·9	18·9
Miyazaki		25·8	9	5 27	0	9 52	− 3	—	—
Nagasaki		26·4	6	e 5 31	− 2	e 10 33	+28	—	—
Nanking		26·7	345	i 5 35	0	10 29	+19	13·9	17·5
Hukuoka		27·4	7	e 5 18	−24	e 9 55	−27	—	17·9
Koti		27·8	12	e 5 46	+ 1	e 10 46	+18	13·5	17·9
Medan		28·3	266	i 5 59	+ 9	i 11 55	+78	—	—
Sumoto		28·8	14	5 53	− 1	e 11 49	+64	14·0	18·1
Kobe		29·2	14	5 58	0	e 10 27	−24	e 12·0	18·8
Osaka		29·2	14	5 46	−12	10 38	−13	15·2	18·7
Taikyu		29·4	3	e 6 9	+ 9	—	—	14·5?	—
Kameyama		29·7	16	6 3	+ 1	11 9	+10	—	—
Toyooka		29·9	13	i 6 5	+ 1	e 11 39	+36	i 14·5	19·7
Nagoya		30·1	16	6 7	+ 1	—	—	e 17·0	—
Zinsen		31·0	359	—	—	e 10 45	−35	e 13·7	—
Keizyo		31·1	0	e 5 29	−46	e 9 47	P_cP	13·5	21·9
Heizyo		32·6	358	e 6 59	+31	e 11 49	+ 4	16·8	—
Hukusima		33·6	20	6 17	−20	11 37	−23	—	—
Chiufeng		35·0	346	6 43a	− 6	12 4	−17	e 16·8	25·2
Mizusawa		35·0	19	e 6 52	+ 3	e 12 27	+ 6	17·3	—
Morioka		35·6	19	6 55	+ 1	—	—	—	—
Vladivostok		36·9	6	7 7	+ 1	e 12 52	+ 2	i 15·5	24·8
Perth		39·9	195	7 28	− 3	13 33	− 2	19·8	22·5
Calcutta		40·6	297	7 47	+10	14 17	+30	22·1	29·9
Ootomari		42·4	15	e 7 58	+ 6	—	—	—	—
Adelaide		42·9	166	e 8 7	+11	i 14 8	−11	21·7	30·5
Riverview		46·4	152	e 8 41	+17	i 18 27	(+ 6)	e 24·7	30·7
Sydney		46·4	152	e 7 4	−80	i 15 16	+ 6	26·8	33·0
Colombo		46·8	273	8 28	+ 1	15 10	− 6	25·6	33·4
Melbourne		47·3	161	i 9 28	+57	i 15 23	0	27·5	29·8
Hyderabad		48·6	288	8 42	+ 1	15 42	+ 1	22·2	33·0
Kodaikanal		49·1	278	i 8 39	− 5	i 16 2	+14	20·5	32·4
Agra	E.	50·8	300	8 53	− 4	16 1	−11	26·2	—
	N.	50·8	300	e 9 0	+ 3	e 16 12	0	—	31·6
Dehra Dun		51·7	304	8 34	−30	16 34	+10	29·1	37·2
Bombay		54·1	289	9 19	− 3	17 18	+21	28·3	38·4
Suva		56·4	117	(9 58)	+19	(17 46)	+18	(29·5)	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Almata		57·2	318	e 9 48	+ 3	—	—	—	—
Andijan		59·4	313	e 10 1	+ 1	—	—	—	—
Tashkent		61·8	315	i 10 18	+ 1	19 9	+30	—	—
Tchimkent		61·9	315	e 10 58	(− 3)	—	—	—	—
Samarkand		63·0	311	e 10 28	+ 3	—	—	—	—
Wellington		64·7	143	10 40	+ 3	19 7	− 9	36·3	40·5
Ekaterinburg		71·8	329	i 11 18	− 4	i 20 36	− 7	34·3	44·9
Baku		76·0	311	e 11 43	− 3	22 19	PS	38·5	38·5
Tiflis		79·9	311	e 12 3	− 4	22 20	+ 5	41·5	49·9
Tananarive		82·3	250	e 12 19	− 1	22 26	−14	34·5	44·5
Kucino		84·2	325	12 26	− 3	22 49	−11	38·1	48·5
Theodosia		86·6	315	e 12 39	− 2	e 23 13	[+ 2]	32·5	—
Ksara		87·3	304	12 41	− 4	23 21	[+ 6]	—	—
Simferopol		87·5	315	e 12 41	− 4	—	—	e 34·8	—
Yalta		87·5	314	e 12 43	− 2	23 31	− 1	—	—
Pulkovo		87·8	330	i 12 45	− 2	i 23 26	− 9	44·5	52·2
Sebastopol		87·9	315	e 12 48	+ 1	—	—	—	—
Sitka		88·6	32	—	—	23 37	− 6	e 36·2	—
Helsingfors	E.	90·3	331	—	—	e 23 26	[− 8]	e 44·2	—
Helwan		91·7	300	i 13 5	0	i 23 58	−14	51·3	62·4
Upsala		93·9	332	—	—	e 23 43	[−12]	e 44·5	52·6
Budapest		97·1	320	e 17 28?	PP	—	—	e 46·5	56·5
Victoria	E.	97·9	39	24 21	SKS	(24 21)	[+ 5]	44·2	—
	N.	97·9	39	25 1	S	(25 1)	− 7	40·7	—
Copenhagen		98·0	329	17 28?	PP	24 16	[0]	35·5	—
Vienna		98·6	323	e 18 50	?	—	—	e 54·5	65·5
Potsdam		99·0	326	e 13 28?	−11	17 28	PP	e 49·5	59·5
Zagreb		99·6	318	e 17 28?	PP	e 24 1	[−22]	e 49·1	54·2
Cheb		100·3	323	e 17 28?	PP	e 27 22	PS	e 52·5	61·5
Triest		101·2	317	e 17 49	PP	i 24 30	[− 2]	e 46·5	55·7
Berkeley		101·9	49	e 18 28?	PP	—	—	—	—
Venice		102·2	320	—	—	26 28?	?	—	—
Treviso		102·2	319	e 16 28?	?	e 24 28?	[− 8]	56·5	63·5
Feldberg		102·5	324	e 16 58	?	—	—	—	77·6
Stuttgart		102·8	323	e 13 54	− 2	e 25 52	+ 1	50·5	63·5
Chur		103·4	321	e 14 0	+ 1	e 24 28	[−14]	—	—
De Bilt		103·5	328	e 14 2	+ 2	e 24 46	[+ 3]	e 47·5	56·9
Florence		103·5	320	14 4	+ 4	24 28	[−15]	50·5	57·0
Strasbourg		103·7	325	14 3	+ 2	—	—	e 47·5	—
Piacenza		104·0	320	—	—	27 28	PS	—	67·5
Tinemaha		105·3	59	i 17 56	[− 6]	—	—	—	—
Mount Wilson		106·4	52	e 18 26	[+20]	—	—	—	—
Paris		106·6	325	(18 28?)	[+21]	—	—	18·5	57·5
Kew		106·6	329	e 18 41	PP	e 25 12	[+15]	e 50·5	57·4
Riverside	Z.	107·0	52	i 18 40	PP	—	—	—	—
Cape Town		109·0	235	—	—	26 30	{+30}	60·5	—
Tortosa	N.	111·9	319	—	—	e 28 28?	PS	e 47·8	61·2
Tucson		112·7	50	—	—	(e 27 28?)	{+62}	e 27·5	—
Alicante		113·8	317	—	—	e 35 24	SS	e 64·4	—
Toledo		115·4	320	e 31 12	?	e 41 44	?	e 57·0	70·2
Almeria		116·0	316	—	—	e 43 31	SSSS	e 70·3	—
San Fernando		118·7	318	19 10	[+28]	29 34	SKSP	48·5	72·5
Chicago		122·3	30	—	—	e 30 16	PS	—	—
Ottawa		124·3	17	e 20 46	PP	e 30 34	SKSP	e 42·5	—
Toronto		124·4	23	e 20 45	PP	i 30 40	PS	—	—
Pittsburgh		126·9	25	—	—	i 38 9	SS	57·5	—
La Plata		151·3	172	19 48	[+ 5]	—	—	77·5	—
San Juan		151·9	27	e 19 48	[+ 4]	e 33 51	SKSP	79·5	—
Huancayo		157·3	106	e 19 57	[+ 7]	e 30 51	{−12}	e 60·5	—
La Paz		162·1	125	19 56k	[0]	26 56	?	79·5	106·9
Sucre		162·7	137	e 20 7	[+10]	—	—	79·5	—

For Notes see next page.

NOTES TO MARCH 17d. 19h. 32m. 32s.

Additional readings and note :—
Amboina i = +2m.48s.
Hong Kong iP = +4m.49s.
Batavia iP = +5m.10s.
Zi-ka-wei PPZ = +6m.3s., PPPZ = +6m.13s., iZ = +7m.2s., and +8m.42s. = P_cP −14s., SSZ = +11m.36s., SSSZ = +12m.2s., SSSSZ = +12m.20s.
Nanking iZ = +7m.16s., SN = +10m.38s.
Medan iE = +6m.11s., i = +7m.4s. and +14m.18s.
Sumoto eSN = +12m.18s.
Kobe PPN = +6m.57s., eZ = +7m.30s.
Osaka i = +6m.16s., +7m.7s., and +7m.29s.
Toyooka ePE = +6m.12s.
Chiufeng i = +8m.19s., +9m.17s. = P_cP−9s., +13m.41s., and +14m.19s. = SS−7s.
Perth PP = +9m.8s., PPP = +9m.28s., PPPP = +9m.48s., P_cS = +13m.23s., SS = +16m.28s., SSS = +17m.3s.
Adelaide iPP = +9m.31s., iPPP = +9m.52s., i = +14m.53s., iSSS = +17m.18s., iS_cS = +18m.16s.
Riverview iN = +15m.1s. = S −9s., iSN = +18m.30s.
Melbourne i = +18m.46s. = SS +13s.
Suva readings have been *increased* by 2m.
Wellington SS = +24m.12s., SSS = +26m.49s., SSSS = +28m.45s., i = +32m.10s.
Tiflis iPEZ = +12m.6s., eE = +12m.48s., eZ = +17m.7s., PSE = +23m.2s., eSSE = +28m.27s., eSSSEZ = +31m.24s.
Tananarive ePPN = +16m.8s., PSE = +23m.21s., SSE = +28m.28s. ?
Pulkovo PP = +16m.8s., SKS = +23m.5s., eSS = +29m.46s., L_q = +40·5m.
Helsingfors eN = +23m.54s. = S −5s. and +34m.59s., eEN = +38m.47s., eE = +40m.5s.
Helwan i = +25m.25s. = PS +14s.
Upsala eN = +24m.24s. = S −8s.
Victoria SN? = .+31m.50s., SE? = +32m.22s.
Zagreb e = +26m.55s. = PS +14s.
Stuttgart ePP = +18m.9s., eSKS = +24m.28s., ePS = +27m.52s.
De Bilt ePPZ = +18m.20s.
Florence i = +18m.18s. = PP +9s., +20m.28s. = PPP +14s., and +21m.56s. = PPPP +4s., PS = +27m.28s., i = +28m.28s., and +31m.43s., SS = +33m.11s., i = +33m.53s., SSS = +37m.58s.
Strasbourg ePP = +18m.28s. ?
Kew ePSE = +27m.47s., eEN = +44m.21s.
Cape Town +27m.30s., +29m.19s., and +30m.31s.
San Fernando PE = +19m.23s., SN = +30m.6s. = PS +16s.
Ottawa e = +37m.40s. = SS +12s.
Pittsburgh i = +38m.17s. = SS +16s.
San Juan e = +19m.56s., +22m.45s., and +37m.53s., eSS = +42m.58s.
Huancayo i = +20m.14s., ePP = +24m.12s., e = +24m.54s., +33m.24s., +34m.14s., +38m.58s., and +43m.24s., eSS = +43m.44s., eSSS = +50m.24s.
La Paz iPKPZ = +20m.2s., $iPKP_2Z$ = +20m.52s., isPZ = +22m.4s., PPZ = +23m.36s., ipPPZ = +24m.50s., iSKS? = +27m.21s., iSKKS = +31m.16s., SP = +35m.57s., sSP = +38m.38s., SS = +44m.42s.
Long waves were also recorded at Tyosi, Arapuni, Honolulu T.H., Ivigtut, Algiers, and other European and American stations.

March 17d. Readings also at 0h. (Berkeley, Branner, Lick, Huancayo, La Paz (2), Ekaterinburg, Andijan, Manila, and near Amboina), 1h. (near Granada, Malaga, and San Fernando), 6h. (Medan), 7h. (near Andijan), 9h. (Wellington, Mount Wilson, Pasadena, Riverside, and Tinemaha), 13h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Bozeman, Seattle, Victoria, Sitka, Tucson, Chicago, Ann Arbor, Pittsburgh, Toronto, Columbia, East Machias, Ekaterinburg, and near Andijan), 14h. (Baku), 15h. (Harvard), 16h. (near Amboina), 17h. (Florence), 18h. (Trenta), 19h. (Mount Wilson, Pasadena, Riverside, and Tinemaha), 23h. (Almeria).

March 18d. 3h. 5m. 26s. Epicentre 59°·0S. 15°·0W. N.3.

A = +·497, B = −·133, C = −·857 ; D = −·259, E = −·966 ; G = −·828, H = +·222, K = −·515.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Cape Town	33·4	57	—	—	11 25	−32	17·1	—
La Plata	36·9	291	7 5	− 1	12 52	+ 2	15·0	—
Johannesburg	44·3	61	—	—	14 34	− 6	19·6	—
Sucre	53·8	297	e 9 18	− 2	i 16 54	+ 1	24·1	—
La Paz	57·3	295	i 9 44a	− 1	i 17 48	+ 8	26·5	30·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tananarive		59·8	76	—	—	e 18 21	+ 8	24·7	27·2
Huancayo		64·6	289	i 10 38	+ 2	e 19 5	−10	e 29·9	—
Wellington		79·4	187	i 14 34	PP	i 25 51	?	44·6	—
Melbourne		81·7	164	—	—	e 22 40	+ 6	35·9	41·4
Adelaide		83·5	158	e 17 40	?	—	—	41·5	52·8
Sydney		86·4	168	—	—	e 23 4	−17	42·6	44·1
San Juan		88·0	312	e 16 14	PP	e 23 4	[−16]	i 42·8	—
San Fernando		95·7	7	14 6	+42	24 36	−12	40·6	55·6
Colombo		98·3	91	17 9	PP	—	—	—	42·1
Toledo		99·3	9	—	—	e 38 28	SSSS	—	—
Kodaikanal		100·0	87	11 49	?	—	—	—	—
Bombay		105·0	79	e 16 34	?	e 18 34	PP	—	—
Florence		105·1	20	24 33	SKS	(24 33)	[−17]	37·1	43·2
Hyderabad		106·6	85	24 9	SKS	(24 9)	[−48]	44·5	60·3
Triest		107·3	21	e 18 49	PP	e 28 44	PS	e 43·6	—
Paris		108·8	12	—	—	(e 32 34?)	?	e 32·6	48·6
Strasbourg		109·2	16	(e 21 34?)	PPP	—	—	e 21·6	—
Stuttgart		109·6	17	—	—	e 34 10	SS	e 43·6	—
Kew		111·1	10	—	—	e 29 34?	?	e 45·6	48·7
Cheb		111·4	19	—	—	e 25 34?	[+15]	e 44·6	48·6
Harvard		111·5	319	—	—	e 35 4	SS	e 52·6	—
Tiflis		112·1	45	19 26	PP	e 26 34	{+12}	50·6	64·3
De Bilt		112·3	13	—	—	e 29 34?	PS	e 45·6	50·4
Baku		112·9	49	e 19 38	PP	e 29 2	PS	50·6	65·6
Toronto		115·6	314	—	—	e 29 19	PS	—	—
Ottawa		115·7	318	—	—	e 29 16	PS	e 49·6	—
Copenhagen		116·8	17	—	—	29 34?	PS	48·6	—
Tashkent		121·8	62	e 19 30	[+40]	—	—	e 51·6	71·1
Helsingfors	N.	123·2	22	—	—	e 37 18	SS	—	—
Phu-Lien		123·8	107	—	—	(37 34?)	SS	37·6	—
Pulkovo		123·9	26	e 20 42	PP	30 41	PS	56·6	66·9
Riverside	Z.	124·9	279	e 18 57	[0]	—	—	—	—
Mount Wilson	Z.	125·3	279	i 18 59	[+ 1]	—	—	—	—
Pasadena	Z.	125·3	279	i 20 5	PP	—	—	—	—
Tinemaha		127·7	281	i 19 6	[+ 4]	—	—	—	—
Hong Kong		128·8	113	24 38	?	32 53	?	50·6	63·2
Ekaterinburg		130·3	45	e 19 10	[+ 2]	25 50	[−30]	57·6	—
Zi-ka-wei	Z.	139·7	115	e 19 34	[+13]	i 34 39	?	41·6	68·7
Chiufeng		144·2	100	e 19 35	[+ 3]	30 44	?	—	78·3
Sitka		149·4	293	—	—	e 42 34?	SS	—	—
Vladivostok		154·3	114	e 22 40	?	—	—	e 41·1	—

Additional readings :—
Cape Town +14m.49s. and +15m.40s.
La Plata PP = +8m.19s.
Johannesburg +18m.4s. = S_cS −4s.
La Paz iP_cP = +10m.13s., PP = +11m.52s., isS = +20m.2s.
Tananarive eN = +18m.29s. = PS +10s., eE = +20m.16s., E = +22m.10s. = SS +5s.
Huancayo e = +15m.24s., iS = +19m.27s. = PS +2s., eSS = +23m.17s., e = +26m.11s.
Melbourne i = +31m.28s., e = +33m.30s.
Adelaide i = +26m.49s. and +29m.49s.
San Juan i = +23m.30s. = S −7s., iSS = +29m.9s.
Florence iPPP = +28m.34s., i = +33m.16s. = SS +4s.
Hyderabad S = +33m.44s. = SS +12s.
Triest e = +33m.54s. = SS +12s.
Tiflis ePPPEZ = +22m.6s., ePSEZ = +28m.44s., eSSEZ = +35m.8s.
De Bilt eEN = +34m.46s. = SS −4s.
Toronto e = +35m.36s. = SS +2s.
Ottawa e = +35m.34s. = SS −1s.
Tashkent e = +20m.14s. = PP −8s., +37m.46s. and +41m.34s.? = SSS +19s.
Riverside ePPZ = +20m.45s.
Mount Wilson iPPZ = +20m.47s., iPPPZ = +20m.58s.
Pasadena ePPZ = +20m.49s., iPPZ = +20m.58s., iZ = +21m.3s.
Hong Kong SS? = +39m.4s.
Ekaterinburg i = +19m.13s. and +21m.24s. = PP +5s., i = +35m.39s. and +36m.16s.
Long waves were also recorded at Perth, Tucson, Bozeman, East Machias, Nanking, Ivigtut, Algiers, Helwan, Ksara, and other European stations.

March 18d. 15h. 51m. 35s. Epicentre 32°·4N. 139°·7E. (as given by Tokyo). N.1.

$A = -\cdot644$, $B = +\cdot546$, $C = +\cdot536$; $D = +\cdot647$, $E = +\cdot763$; $G = -\cdot409$, $H = +\cdot347$, $K = -\cdot844$.

A *depth* of focus 0·020 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Hatidyozima		+0·6	0·7	9	0 23	+ 5	0 41	+ 8	—	—
Mera		+0·3	2·5	3	0 40	0	1 12	0	—	—
Omaesaki		+0·3	2·5	331	0 41	+ 1	1 14	+ 2	—	—
Numadu		+0·3	2·8	346	0 44	0	0 57	−23	—	—
Misima		+0·3	2·8	347	0 44	0	1 20	0	—	—
Hamamatu		+0·3	2·9	324	0 43	− 3	1 17	− 5	—	—
Yokohama		+0·3	3·0	359	0 48	+ 1	1 25	0	—	—
Hunatu		+0·2	3·2	346	0 50	+ 1	1 29	+ 2	—	—
Tokyo		+0·2	3·3	1	0 51	+ 1	1 29	− 1	—	1·6
Kohu		+0·2	3·4	345	0 52	+ 1	1 34	+ 2	—	—
Tyosi		+0·2	3·5	15	i 0 55	+ 2	1 33	− 2	—	1·9
Siomisaki		+0·2	3·5	287	0 51	− 2	1 31	− 4	—	—
Nagoya		+0·2	3·6	321	i 0 54	0	1 37	0	—	1·7
Kameyama		+0·2	3·6	312	0 54	0	1 38	+ 1	—	—
Kumagaya		+0·2	3·7	356	0 55	− 1	1 40	0	—	—
Gihu		+0·2	3·8	321	0 57	0	1 38	− 4	—	—
Kakioka		+0·2	3·8	6	0 56	− 1	1 40	− 2	—	—
Tukubasan		+0·2	3·8	5	0 58	+ 1	1 41	− 1	—	—
Hikone		+0·1	4·0	315	1 1	+ 3	1 50	+ 5	—	—
Maebasi		+0·1	4·0	353	0 58	0	1 54	+ 9	—	—
Mito		+0·1	4·0	9	1 1	+ 3	1 43	− 2	—	—
Matumoto		+0·1	4·1	340	0 59	− 1	1 46	− 2	—	—
Osaka		+0·1	4·1	305	1 1	+ 1	1 49	+ 1	—	2·2
Osaka	B.	+0·1	4·2	302	1 0	− 1	1 50	0	—	—
Kyoto		+0·1	4·2	310	1 1	0	1 50	0	—	—
Wakayama		+0·1	4·2	297	1 1	0	1 50	0	—	—
Sumoto		+0·1	4·4	297	i 1 4k	0	i 1 52	− 3	—	2·2
Kobe		+0·1	4·4	302	i 1 4k	0	1 48	− 7	—	2·0
Nagano		+0·1	4·4	344	1 5	+ 1	2 6	+11	—	—
Toyama		0·0	4·7	334	1 10	+ 3	2 6	+ 6	—	—
Toyooka		0·0	5·1	308	i 1 12k	− 1	i 2 6	− 4	—	2·4
Koti		0·0	5·3	284	e 1 15k	0	i 2 15	0	—	—
Wazima		0·0	5·5	336	1 18	0	2 17	− 3	—	—
Simidu		0·0	5·7	276	1 20	− 1	2 23	− 2	—	—
Titizima		0·0	5·8	158	1 15	− 7	2 18	−10	—	—
Matuyama		0·0	6·0	286	1 21	− 4	2 27	− 6	—	—
Hamada		−0·1	6·8	293	1 35	0	2 54	+ 3	—	—
Mizusawa	E.	−0·1	6·8	9	i 1 34	− 1	i 2 45	− 6	—	—
	N.	−0·1	6·8	9	e 1 29	− 6	i 2 48	− 3	—	—
Miyazaki		−0·1	7·0	268	1 29	− 9	2 56	0	—	—
Akita		−0·1	7·3	4	1 44	+ 2	2 54	−10	—	—
Morioka		−0·1	7·4	9	1 41	− 3	2 59	− 7	—	—
Kumamoto		−0·1	7·6	275	1 44	− 2	3 10	− 1	—	—
Hukuoka		−0·1	7·9	281	i 1 50k	− 1	i 3 15	− 4	—	3·6
Hukuoka	B.	−0·1	7·9	281	1 50	− 1	3 17	− 2	—	—
Nagasaki		−0·1	8·3	275	1 54	− 2	3 28	− 1	—	3·7
Nake		−0·2	9·7	248	2 16	+ 2	4 1	0	—	—
Taikyu		−0·2	9·8	294	i 2 16	0	4 20	+17	—	—
Sapporo		−0·2	10·7	7	2 19	− 9	—	—	—	—
Keizyo		−0·3	11·6	300	2 40	+ 1	4 59	+14	7·2	—
Zinsen		−0·3	11·8	299	i 2 42k	0	e 5 16	+26	6·9	—
Naha		−0·3	12·2	242	2 50	+ 3	5 3	+ 3	—	—
Vladivostok		−0·3	12·3	332	i 2 48	0	5 5	+ 2	5·7	7·1
Heizyo		−0·4	13·1	304	i 2 59	+ 1	e 5 6	−14	6·8	—
Zi-ka-wei	Z.	−0·5	15·6	271	i 3 27k	− 3	i 6 23	+ 6	10·1	11·8

Continued on next page.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Isigakizima	−0·5	15·9	241	3 29	− 5	6 26	+ 2	—	—
Taihoku	−0·6	17·5	250	3 52	− 1	7 4	+ 5	—	—
Nanking	−0·7	17·7	275	i 3 50	− 4	e 7 13	+11	—	—
Chiufeng	−0·8	20·4	299	i 4 20k	− 5	8 0	+ 2	e 10·8	13·7
Manila	−1·1	24·6	228	5 39	+34	10 13	+59	13·2	—
Hong Kong	−1·1	24·7	252	5 4	− 2	9 25	+ 9	—	16·9
Phu-Lien	−1·5	31·6	256	6 25?	+19	—	—	—	—
Almata	−2·1	49·6	302	e 8 37	+ 5	—	—	—	—
Andijan	−2·2	53·4	299	e 8 57	− 3	—	—	—	—
Tashkent	−2·3	55·5	301	—	—	e 17 37	+52	e 27·6	30·2
Ekaterinburg	−2·4	57·6	321	i 9 32	+ 2	i 17 18	+ 6	26·4	—
Baku	−2·6	69·6	306	10 50	− 2	e 20 38	+53	35·4	44·2
Pulkovo	−2·6	71·2	330	i 10 58	− 4	i 20 3	− 1	36·4	—
Tiflis	−2·6	72·4	309	e 11 7	− 2	e 20 15	− 4	e 36·4	46·3
Theodosia	−2·6	76·6	315	e 11 32	− 3	e 21 3	− 5	—	—
Branner	−2·6	76·6	54	e 11 29	− 6	—	—	—	—
Yalta	−2·7	77·6	315	e 11 37	− 3	—	—	—	—
Tinemaha	−2·7	79·5	53	i 11 48	− 2	—	—	—	—
Santa Barbara	−2·7	79·9	55	e 11 54	+ 1	—	—	—	—
Haiwee	−2·7	80·2	53	i 11 54	− 1	—	—	—	—
Pasadena	−2·7	81·1	55	i 11 58	− 1	—	—	—	—
Copenhagen	−2·7	81·1	333	—	—	21 52	− 6	—	—
Mount Wilson	−2·7	81·2	55	i 11 58	− 2	—	—	—	—
Riverside	−2·7	81·2	55	i 12 0	0	—	—	—	—
La Jolla	−2·7	82·5	56	i 12 7	0	—	—	—	—
Ksara	−2·7	82·5	305	e 11 25?	−42	22 6	− 8	—	—
La Paz	—	150·2	63	e 19 32	[−10]	—	—	—	—

Additional readings :—
Kumagaya +1m.34s.
Kobe iE = +1m.16s. and +1m.28s., SN = +1m.51s., i = +1m.56s.
Toyooka iSZ = +2m.12s.
Koti eS_0SN = +14m.58s. ; T_0 = 15h.51m.31s.
Taikyu e = +3m.20s.
Zinsen e = +6m.9s., P_0P = +7m.32s.
Chiufeng i = +4m.53s. and +8m.50s.
Hong Kong PP = +5m.35s.
Tashkent e = +24m.37s.
Long waves were also recorded at Paris, Strasbourg, and Stuttgart.

March 18d. 23h. 19m. 21s. Epicentre 54°·8N. 161°·7E. (as on 17d. 15h.). X.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	20·9	230	—	—	e 7 32	−52	—	—
Vladivostok		22·5	251	—	—	e 9 23	SS	11·4	13·4
Nagoya		26·0	231	e 5 20	− 9	—	—	—	—
Chiufeng		33·4	264	e 7 52	PP	e 14 42	?	—	22·4
Manila		51·1	234	e 9 41	+41	—	—	—	—
Ekaterinburg		51·4	317	e 9 3	+ 1	e 16 32	+12	24·7	33·5
Tinemaha		55·1	74	i 9 29	− 1	i 20 19	SS	—	—
Mount Wilson		57·3	76	i 9 46	+ 1	—	—	—	—
Riverside	Z.	57·9	76	i 9 49	− 1	e 20 3	(+26)	—	—
Florissant	E.	68·0	53	e 10 58	0	—	—	—	—
Baku		68·5	311	e 13 52?	PP	e 29 36	?	37·2	45·8
Tiflis		69·6	315	11 7	− 1	e 20 19	+ 3	e 39·2	46·9
Florence		78·3	338	e 15 39	?	—	—	—	43·7

Additional readings :—
Vladivostok e = +10m.58s.
Tiflis eSSSE = +29m.39s.
Long waves were also recorded at Phu-Lien, Bombay, Tashkent, Pulkovo, Kucino, Copenhagen, and Cheb.

March 18d. 23h. 32m. 57s. Epicentre 16°·5N. 86°·0W. (as on 1933 Feb. 18d.). X.

A = +·067, B = −·956, C = +·284 ; D = −·998, E = −·070 ;
G = +·020, H = −·283, K = −·959.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Columbia		18·0	14	e 3 45	−22	e 7 27	+ 2	e 8·8	—
San Juan		19·0	81	i 4 19	0	i 8 11	SS	10·4	—
Little Rock		19·1	344	e 4 15	− 5	e 7 19	−29	—	—
Charlottesville		22·4	16	e 5 5	+10	e 7 3	−110	e 11·0	—
St. Louis		22·4	351	e 4 23	−32	i 8 33	− 20	—	—
Florissant		22·6	351	i 4 51	− 6	i 9 9	+12	—	—
Cincinnati		22·7	4	i 4 58	0	i 9 13	+14	—	—
Georgetown		23·7	18	i 5 10	+ 3	9 30	+12	e 11·0	—
Pittsburgh		24·5	11	e 5 48	PP	e 9 45	+13	12·4	—
Chicago		25·3	357	—	—	e 9 33	−13	e 14·4	—
Madison		26·7	355	i 5 37	+ 2	e 10 8	− 2	—	17·0
Tucson		27·5	310	e 5 51	+ 8	e 10 25	+ 1	—	—
Toronto		27·7	10	e 5 28	−16	i 10 40	+13	15·0	—
Ottawa		30·1	15	e 6 5	− 1	e 11 10	+ 4	e 16·0	—
Huancayo		30·4	159	e 5 57	−12	—	—	e 11·2	—
East Machias		32·3	26	—	—	e 11 39	− 1	—	—
La Paz	E.	37·4	151	i 7 26	+16	—	—	22·8	26·0
Sucre		41·0	149	e 8 28	+48	—	—	—	—
Toledo		73·4	53	11 48	+17	e 21 18	+17	e 37·3	—
Stuttgart		81·0	42	e 12 9	− 4	—	—	e 37·0	—
Helsingfors	E.	85·6	27	—	—	(e 22 27)	[−36]	e 22·5	—

Additional readings :—
San Juan i = +4m.29s. = PP + 1s.
Cincinnati iPZ = +5m.6s. = PP − 13s.
Georgetown i = +5m.14s., PPNZ = +5m.39s.
Pittsburgh e = +9m.35s.
Tucson e = +10m.35s.
Huancayo ePP = +6m.57s.
Helsingfors eLN = +24m.28s. = PS + 29s.
Long waves were also recorded at Balboa Heights and San Fernando.

March 18d. After-shocks from the neighbourhood of the epicentre on March 2d. were recorded at Mizusawa as follows :—

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
			e 1	4	51	i 11	45	36	i 11	46	6
			e 2	32	34	e 20	34	14	i 20	34	25
e 2	51	49	e 2	52	18	e 21	24	22	i 21	25	56
			e 6	8	13	i 22	49	53	i 22	50	18

March 18d. Readings also at 0h. (Almata and Andijan), 1h. (Riverview), 2h. (Calcutta, Baku, Ekaterinburg, Tiflis, and Nagoya), 3h. (Florence, Wellington, Sumoto, near Osaka, and near Tyosi), 5h. (La Paz), 7h. (near La Paz), 9h. (near Mizusawa), 11h. (Berkeley, Branner, Lick, Mount Wilson, Pasadena, Riverside, near Algiers, Nagoya, and Tyosi), 16h. (Ootomari), 17h. (Ekaterinburg, Tashkent, Chiufeng, Phu-Lien, and near Hong Kong), 18h. (Wellington, Sydney, Cape Town, Tananarive, Bombay, Hyderabad, Phu-Lien, Baku, Ekaterinburg, Tiflis (2), Tashkent, Pulkovo, Kucino, Simferopol, Theodosia, Yalta, Florence, Triest, Belgrade, Zagreb, and near Athens), 19h. (Athens, San Fernando, Dehra Dun, Hong Kong, East Machias, and Branner (2)), 21h. (Ekaterinburg, Tashkent, Vladivostok, Chiufeng, Osaka, Nagoya, and Tyosi), 22h. (Baku, Tiflis, Kucino, Nagoya (2), and Tyosi), 23h. (Hong Kong and Tyosi).

March 19d. After-shocks from the neighbourhood of the epicentre on March 2d. were recorded at Mizusawa as follows :—

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 1	2	53	e 1	3	18				e 17	35	21
e 2	39	7	i 2	39	39	e 20	36	47	i 20	37	19
i 9	56	.52	e 9	57	14	e 21	3	32	i 21	4	0
e 12	50	41	e 12	51	18	e 22	17	1	e 22	17	36
e 17	16	43	e 17	17	4						

March 19d. Readings also at 0h. (Strasbourg), 1h. (Baku, Ekaterinburg, Tashkent, Vladivostok, Chiufeng, Manila, and Hong Kong), 2h. (Tiflis), 3h. (near Manila), 8h. (near Nagoya and near Sitka), 9h. (Huancayo and La Paz), 11h. (Baku, Ekaterinburg and Hyderabad), 16h. (Branner and near Nagoya), 17h. (Baku, Ekaterinburg, Tiflis, Tashkent, Chiufeng, Vladivostok, Port au Prince, Nanking, and San Juan), 18h. (Perth), 19h. (Chiufeng and Paris), 20h. (Tyosi), 21h. (San Juan), 23h. (Nanking).

March 20d. 16h. 38m. 22s. Epicentre 38°·9N. 1°·7W. N.3.

$A = +\cdot778$, $B = -\cdot023$, $C = +\cdot628$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Alicante	1·1	120	0 19	+ 3	0 36	+ 8
Toledo	2·0	298	i 0 29	0	i 0 53	+ 2
Almeria	2·1	196	—	—	e 0 58	S_g
Granada	2·3	221	e 0 38	P*	1 12	S_g
Malaga	3·1	225	e 0 36	− 8	i 1 23	+ 3

Additional readings :—
Alicante SS = +45s.
Toledo SS = +1m.1s. = S_g +1s., SSS = +1m.8s.
Granada PS = +1m.5s. = S* − 2s., $1S_g$ = +1m.17s., SS = +1m.28s.
Malaga PP = +55s. = P_g − 1s., i = +1m.3s., PS = +1m.18s., SS = +1m.40s. = S_g +4s.

March 20d. After-shocks from the neighbourhood of the epicentre of the earthquake on 2d. were recorded as follows :—

Mizusawa.

P.			S.			P.			S.		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
e 3	14	54	e 3	15	16	i 12	34	1	i 12	34	27
			e 5	14	3				e 12	44	43
			e 5	32	10				e 13	10	52
e 8	6	32	e 8	7	2	e 15	22	14	e 15	22	40
i 10	38	6	e 10	38	26	e 22	6	42	e 22	7	13

Tyosi.

			10	39	7	e 12	34	41	12	35	19

March 20d. Readings also at 1h. (La Paz), 2h. (near Apia), 10h. (Amboina, Ekaterinburg, Haiwee, Tinemaha, Mount Wilson, Pasadena, Huancayo, La Paz, and Sucre), 11h. (Baku and Tiflis), 12h. (Nagoya), 14h. (Lick), 15h. (near Manila), 16h. (Berkeley and Lick), 17h. (near Hukuoka, Koti, and Sumoto), 19h. (Hong Kong, Manila, and near Taihoku), 20h. (near Sumoto), 22h. (Huancayo and La Paz).

March 21d. 15h. 54m. 6s. Epicentre 38°·9N. 141°·3E. (as given by Tokyo). N.2.

A = −·607, B = +·487, C = +·628; D = +·625, E = +·780;
G = −·490, H = +·393, K = −·778.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Mizusawa	0·3	331	i 0 12	+ 8	i 0 26	+18	—
Isinomaki	0·5	178	0 6	− 1	0 17	+ 4	—
Morioka	0·8	353	0 17	+ 6	0 34	+13	—
Yamagata	1·0	229	0 14	0	0 29	+ 3	—
Akita	1·2	310	0 25	+ 8	0 43	+12	—
Aomori	2·0	348	0 33	+ 4	1 1	S_g	—
Utunomiya	2·6	206	0 32	− 5	0 59	− 8	—
Kakioka	2·8	198	0 35	− 5	1 3	− 9	—
Tukubasan	2·9	199	0 35	− 6	1 4	−10	—
Maebasi	3·0	215	0 41	− 2	1 15	− 2	—
Kumagaya	3·1	209	0 41	− 3	1 16	− 4	—
Tyosi	3·2	186	e 0 39	− 7	1 11	−11	1·5
Nagano	3·3	228	0 47	0	1 20	− 5	—
Tokyo	3·5	201	0 45	− 5	1 21	− 9	—
Yokohama	3·7	201	0 51	− 2	1 27	− 8	—
Wazima	3·8	248	0 54	0	1 36	− 1	—
Kohu	3·9	215	0 55	− 1	1 37	− 3	—
Hunatu	3·9	212	0 54	− 2	1 37	− 3	—
Sapporo	4·2	1	1 5	P*	—	—	—
Misima	4·2	206	0 56	− 4	1 37	−11	—
Gihu	5·0	227	1 8	− 3	—	—	—
Nagoya	5·1	224	e 1 10	− 3	2 29	S*	—
Kameyama	5·6	225	1 0	−20	2 55	S_g	—
Osaka	6·2	229	1 36	P*	3 13	S_g	3·6

Tyosi gives also iP = +53s.

March 21d. 17h. 11m. 10s. Epicentre 36°·5N. 141°·7E. (as on 1931 June 23d.) X.
Osaka gives position near 36°·9N. 141°·7E.

A = −·631, B = +·498, C = +·595.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Tyosi	1·0	221	e 0 15	+ 1	0 27	+ 1	0·5
Mizusawa	2·7	350	e 0 38	− 1	i 1 9	0	—
Nagoya	4·1	252	e 0 59	+ 1	1 49	+ 4	—
Osaka	5·3	252	1 22	P*	2 37	S*	3·2

Tyosi gives also iP = +21s.

March 21d. 23h. 18m. 20s. Epicentre 32°·6N. 131°·1E. X.
(as on 1932 Nov. 29d.).

A = −·554, B = +·635, C = +·539; D = +·754, E = +·657;
G = −·354, H = +·406, K = −·842.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hukuoka		1·1	330	0 12_a	− 4	i 0 24	− 4	—	0·5
Nagasaki		1·1	277	0 14	− 2	0 29	+ 1	0·8	0·9
Koti		2·3	65	e 0 34	+ 1	e 1 10	S_g	1·2	1·4
Sumoto		3·6	61	e 0 26	−25	1 49	S*	—	1·9
Kobe	E.	4·0	59	e 0 50	− 7	2 5	S*	—	—
	N.	4·0	59	e 0 58	+ 1	2 3	S*	—	2·6
Osaka		4·2	60	1 17	P_g	2 18	S_g	—	3·3
Toyooka		4·3	47	i 1 1	0	e 2 12	S_g	—	2·4
Nagoya		5·5	61	e 1 24	+ 6	2 53	S_g	—	—

Additional readings:—
Sumoto eE = +52s. = P + 1s., eZ = +1m.3s. = P_g − 3s., SZ = +1m.53s.
Kobe eSZ = +2m.12s. = S_g + 6s.
Long waves were also recorded at Vladivostok and Ekaterinburg.

March 21d. After-shocks from the neighbourhood of the earthquake on 2d. were recorded as follows :—

Mizusawa.
eS =17h.8m.9s., eS =21h.52m.43s., eP =23h.25m.51s., eS =23h.26m.29s.

Tyosi.
eP =23h.26m.43s., S =23h.27m.14s.

March 21d. Readings also at 3h. (Lick), 6h. (Huancayo and La Paz and Wellington), 8h. (Kobe and Lick), 10h. (near Santiago), 12h. (near Sumoto), 14h. (Tananarive and Tyosi), 16h. (near Sumoto), 17h. (Uccle), 19h. (near Manila (2)), 21h: (near Hukuoka and near Manila), 23h. (Lick).

March 22d. 2h. 23m. 0s. Epicentre 42°·5N. 74°·0E. N.3.

A = +·203, B = +·709, C = +·676 ; D = +·961, E = −·276 ;
G = +·186, H = +·649, K = −·737.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Almata	2·2	71	0 27	− 4	0 59	+ 2	—	—
Andijan	2·2	215	0 32	+ 1	1 10	S_g	—	—
Samarkand	6·0	243	1 26	+ 1	2 42	+ 9	—	—
Ekaterinburg	16·6	334	e 3 45	− 4	6 44	− 8	10·0	10·4
Baku	18·2	271	e 4 19	PP	7 54	SS	10·4	10·8
Tiflis	21·7	279	e 4 51	+ 3	e 9 3	SS	e 13·2	—
Calcutta	23·3	145	5 4	0	9 34	+24	13·2	—
Bombay	23·6	182	5 10	+ 4	9 36	+20	—	—
Hyderabad	25·4	170	6 45	+81	10 5	+17	10·8	13·9
Kucino	26·7	312	—	—	e 10 26	+16	13·3	14·7
Pulkovo	31·6	318	e 6 14	− 5	e 11 35	+ 6	16·0	19·7

Additional readings :—
Almata P* = +29s.
Andijan iP* or P_g = +38s. =P_g +0s.
Tiflis eEZ = +11m.25s.
Kucino e = +12m.54s.
Long waves were also recorded at Chiufeng, Vladivostok, and several European stations.

March 22d. 18h. 14m. 40s. Epicentre 38°·0N. 20°·5E. (as on 1932 Oct. 1d.). R.2.

A = +·738, B = +·276, C = +·616 ; D = +·350, E = −·937 ;
G = +·577, H = +·216, K = −·788.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		2·5	91	0 39a	+ 3	(1 7)	+ 3	1·1	1·6
Taranto		3·5	316	0 4	−46	0 56	−34	—	—
Trenta		3·5	293	e 0 35	−15	1 17	−13	—	—
Messina		3·9	273	e 1 22	P_g	2 37	S_g	—	—
Catania		4·3	265	e 1 24	P_g	—	—	—	4·6
Mineo		4·7	262	0 45	?	—	—	—	—
Naples	N.	5·6	303	e 1 43	P_g	e 2 58	S_g	—	4·8
Belgrade		6·8	0	(1 42a)	+ 5	(e 2 59)	+ 6	—	(3·7)
Camerino		7·5	315	1 46	0	3 53	S*	—	—
Zagreb		8·5	338	e 1 53	− 7	e 3 39	+ 3	—	5·1
Sienna		8·7	310	2 50	+47	4 20?	S*	—	7·3
Florence		9·0	313	2 36	+29	3 10	−39	—	4·3
Triest		9·1	329	2 3	− 6	i 3 38	−13	i 5·1	5·9
Prato		9·2	312	e 2 14	+ 4	4 36	S*	—	5·3
Budapest		9·5	355	2 39	+25	5 5	S_g	6·3	8·3
Treviso		9·8	323	e 3 30	?	6 6	?	—	—
Vienna		10·6	345	e 2 52	+23	i 4 53	+25	—	7·2
Piacenza		10·7	314	e 3 56	?	5 10	S*	7·0	9·7
Chur		12·0	321	e 2 42	− 6	i 4 52	−11	—	—
Zurich		12·8	321	e 3 4	+ 5	e 5 8	−14	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ksara		13·1	104	e 3 5?	+ 2	e 5 28?	− 1	—	—
Cheb		13·4	337	e 2 20?	−47	—	—	—	8·3
Neuchatel		13·4	316	e 2 59	− 8	i 5 22	−15	—	—
Stuttgart		13·5	327	e 3 14	+ 5	e 5 42	+ 3	7·5	9·8
Strasbourg		14·0	323	(e 3 20?)	+ 5	—	—	e 3·3	—
De Bilt		17·7	328	—	—	e 7 26	+ 9	e 9·3	10·4
Copenhagen		18·5	346	—	—	7 42	+ 6	9·3	—
Tiflis		18·9	71	e 4 20	+ 3	8 9	+25	10·9	12·6
Kew		19·8	319	—	—	e 8 6	+ 4	e 10·3	—
Helsingfors	E.	22·4	6	e 3 32	?	—	—	—	—
Pulkovo		22·6	13	i 4 52	− 5	e 8 59	+ 2	11·8	13·2
Baku		22·8	75	5 2	+ 3	e 9 8	+ 7	13·3	16·5
Ekaterinburg		32·3	41	e 6 23	− 2	—	—	15·3	19·2
Vladivostok		77·8	45	(12 32)	+35	—	—	12·5	—

Additional readings and notes :—
Athens $iP_gEZ = +43s. = P^* - 2s.$
Belgrade e = (+1m.55s.), (+2m.3s.), (+2m.20s.), (+3m.21s.), and (+3m.34s.): readings have been *diminished* by 3m.
Zagreb e = +2m.28s. and +3m.4s., i = +3m.58s. and +4m.17s. = S* +6s.
Vienna PP = +3m.40s., PPP = +3m.52s., iN = +3m.59s., iZ = +5m.34s., iE = +5m.40s. $= S_g - 4s.$, iN = +5m.54s., iEN = +6m.32s., iN = +6m.50s., S? = +7m.0s.
Treviso SS = +8m.0s.
Ekaterinburg e = +9m.1s. $= P_cP - 16s.$ and +13m.4s. = SS − 20s.
Long waves were also recorded at Kucino, Theodosia, and other European stations.

March 22d. Readings also at 1h. (Tyosi and near Mizusawa), 2h. (La Paz), 6h. (near Almata and Andijan), 7h. (Tyosi), 9h. (Haiwee, Pasadena, Tinemaha, and near Mizusawa), 11h. (Lick and near Manila (2)), 13h. (Berkeley, Branner, Lick, San Francisco, Ukiah, Bozeman, and Tucson), 14h. (Nanking), 15h. (Mizusawa), 16h. (near Nagoya, Osaka, Mizusawa (2), Tyosi, and near Tortosa), 17h. (Huancayo, Toledo, La Paz, and near Mizusawa), 19h. (Seatoun, Wellington, and near New Plymouth), 20h. (Tananarive and near Hukuoka (2)), 23h. (Branner).

March 23d. 12h. 42m. 54s. Epicentre 39°·5N. 145°·0E. (as on 7d. 22h.). X.

A = −·632, B = +·443, C = +·636.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		3·0	263	e 0 42	− 1	e 1 4	−13	—	—
Tyosi		5·0	222	e 1 11	0	e 2 2	− 6	—	—
Nagoya		7·7	239	e 1 57	+ 8	2 48	−28	—	—
Vladivostok		10·4	295	i 2 27	+ 1	—	—	5·4	6·1
Chiufeng		22·1	281	e 4 4	−48	e 8 48	0	—	14·6
Tinemaha		71·9	56	i 11 23	+ 1	—	—	—	—
Mount Wilson	z.	73·7	58	i 11 32	− 1	—	—	—	—
Riverside	z.	74·3	58	i 11 37	+ 1	—	—	—	—

Additional readings :—
Mizusawa eSN = +1m.7s.
Long waves were also recorded at Hong Kong and Ekaterinburg.

March 23d. 12h. 50m. 54s. Epicentre 33°·7N. 135°·2E. (as on 1932 Nov. 6d.). X.

A = −·590, B = +·586, C = +·555.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Sumoto	0·7	338	0 10	0	0 25	+ 7	0·4
Kobe	1·0	359	0 14	0	0 30	+ 4	0·6
Osaka	1·0	12	0 14	0	0 28	+ 2	0·8
Nagoya	2·0	45	e 0 29	0	0 51	0	—

Osaka gives also i = +18s.

March 23d. 17h. 38m. 30s. Epicentre 50°·8N. 110°·1E. N.3.

$A = -\cdot217$, $B = +\cdot593$, $C = +\cdot775$; $D = +\cdot939$, $E = +\cdot344$; $G = -\cdot266$, $H = +\cdot728$, $K = -\cdot632$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Chiufeng		11·5	156	e 2 16	−26	i 4 10	−40	i 4·8	7·1
Heizyo		16·1	131	e 3 44	+ 1	e 7 5	+24	10·1	—
Vladivostok		16·7	109	4 19	+29	i 8 3	L	(i 8·1)	12·7
Zinsen		17·8	132	e 3 59	− 5	e 8 53	?	e 10·0	—
Keizyo		17·9	131	4 3	− 2	e 7 42	+20	9·4	—
Nanking		19·8	158	e 3 50	−37	—	—	8·4	11·9
Taikyu		20·0	131	e 4 27	− 3	8 14	+ 8	—	—
Sikka		21·1	81	e 13 12	?	—	—	e 15·6	18·2
Zi-ka-wei	Z.	21·3	152	4 13	−30	8 1	−31	—	13·6
Sapporo		22·5	98	7 10	?	—	—	—	—
Hukuoka	B.	22·8	132	5 1	+ 2	—	—	—	—
Nagasaki		23·2	134	e 9 17	S	(e 9 17)	+ 9	—	—
Toyooka		23·5	121	e 6 2	+57	—	—	e 13·5	—
Kumamoto		23·6	132	5 5	− 1	—	—	—	—
Almata		23·7	264	e 4 15	−52	—	—	—	12·9
Koti		24·3	126	e 5 14	+ 1	—	—	e 13·2	13·9
Gihu		24·7	118	6 27	+70	—	—	—	—
Andijan		27·8	264	e 4 55	−50	—	—	12·5	—
Hong Kong		28·7	172	9 30	(+24)	10 45	+ 2	—	15·0
Tchimkent		28·8	268	e 5 10	−44	—	—	—	—
Ekaterinburg		29·1	301	i 5 43	−14	10 34	−16	i 18·8	18·8
Phu-Lien		30·2	187	e 6 15	+ 8	10 47	−20	13·0	—
Samarkand		31·8	266	e 8 55	?	—	—	—	—
Calcutta		33·0	218	6 5	−27	9 47	?	12·3	—
Agra	E.	33·9	237	6 1	−38	—	—	—	—
Manila		37·3	162	8 3	PP	13 3	+ 7	16·7	19·5
Kucino		41·4	306	—	—	e 17 57	(+ 7)	e 21·7	23·7
Hyderabad		41·8	228	7 40	− 7	13 33	−30	18·0	20·7
Baku		42·2	280	e 7 54	+ 4	14 20	+11	20·8	28·3
Bombay		43·4	236	8 2	+ 2	13 53	−34	19·5	24·1
Pulkovo		43·5	313	e 7 54	− 7	14 30	+ 2	20·5	26·9
Tiflis		44·6	284	e 7 52	−18	e 15 1	+17	e 26·1	28·0
Upsala		49·0	318	—	—	e 20 54	?	—	29·6
Copenhagen		53·6	316	—	—	18 0	+70	27·5	—
Ksara		54·9	281	e 10 20	(−14)	e 17 30	+22	35·5	—
Potsdam		55·5	313	—	—	e 21 30?	SS	e 29·0	35·5
De Bilt		59·2	316	—	—	e 18 30?	+25	30·5	36·2
Triest		59·7	306	—	—	e 17 42	−30	i 26·8	36·1
Stuttgart		59·7	311	e 10 3	+ 1	e 17 42	−30	e 30·3	37·8
Neuchatel		62·0	311	e 13 6	?	—	—	—	—
Florence		62·2	306	17 3	?	21 30	?	27·5	35·5

Additional readings and notes :—
Heizyo eE = +4m.50s., i = +8m.43s.
Zinsen eE = +5m.6s. and +9m.28s.
Keizyo e = +5m.9s.
Nanking iZ = +4m.57s.
Taikyu e = +9m.21s.
Zi-ka-wei iZ = +5m.20s. and +9m.5s.
Nagasaki eS = +13m.18s.; true S is given as eP.
Koti iZ = +6m.17s.
Hong Kong S? = +12m.11s.; true S is given without phase.
Tiflis eE = +8m.54s., eSSE = +18m.37s. = S_0S +27s.
Stuttgart e = +26m.0s.
Long waves were also recorded at Theodosia, Sitka, Pittsburgh, and other European and Japanese stations.

March 23d. Readings also at 4h. (near Mizusawa), 5h. (Berkeley (2)), 7h. (Athens, Taranto, Trenta, Triest, Pulkovo, Ekaterinburg, and Tiflis), 9h. (near Mizusawa and Tyosi), 10h. (La Paz (2)), 12h. (Alicante), 13h. (near Apia), 14h. (near Koti), 15h. (near Tyosi), 16h. (Chiufeng and near Mizusawa), 18h. (Paris, Strasbourg, Vienna, Jena, Göttingen, Stuttgart, Neuchatel, De Bilt, and near Uccle), 20h. (La Paz), 22h. (Sitka), 23h. (Tchimkent, Andijan, near Almata, Nagoya, and near Mizusawa).

March 24d. Readings at 2h. (Mount Wilson, Tinemaha, Tucson, and San Juan), 6h. (La Paz and near Mizusawa), 8h. (near Mizusawa), 9h. (Samarkand, near Andijan, and Tchimkent), 12h. (Mizusawa), 13h. (Alicante, Tiflis, and near Mizusawa), 17h. (Kobe and Medan), 18h. (Samarkand (2) and near Andijan (2)), 19h. (Mizusawa), 22h. (Mizusawa, Hong Kong, and near Hokoto).

March 25d. 12h. 50m. 26s. Epicentre 32°·9N. 130°·8E. (as on 1933 Feb. 6d.). R.3.

The Japanese stations give 32°·9N. 131°·1E.

A = −·549, B = +·636, C = +·543 ; D = +·757, E = +·653 ;
G = −·355, H = +·411, K = −·840.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hukuoka		0·8	335	0 9a	− 2	i 0 21	0	—	0·5
Nagasaki		0·8	258	0 12	+ 1	0 25	+ 4	—	0·8
Koti		2·4	74	e 0 32	− 2	e 0 59	− 3	e 1·1	1·3
Husan		2·7	326	e 0 38	− 1	1 15	S*	—	—
Taikyu		3·5	329	1 1	P_g	1 46	S*	—	—
Sumoto		3·7	65	e 1 0	P*	1 46	S*	—	1·8
Kobe		4·1	62	e 1 10	P*	e 1 56	S*	i 2·1	2·2
Osaka		4·3	64	1 3	+ 2	2 3	S*	—	3·2
Toyooka		4·3	49	i 1 5	+ 4	i 2 2	S*	—	2·4
Keizyo		5·6	328	1 43?	P_g	e 2 39	S*	2·9	—
Nagoya		5·6	64	e 1 18	− 2	e 2 44	S*	—	—
Zinsen		5·7	325	1 44	P_g	2 56	S_g	—	—
Heizyo		7·4	328	e 2 38	P_g	3 49	S_g	—	—
Nanking	E.	10·2	269	e 2 27	+ 3	e 5 44	S_g	e 7·8	—
Chiufeng		13·8	306	—	—	e 6 0	+14	—	8·8

Additional readings :—
Toyooka iPEN = +1m.8s. = P* − 2s.
Zinsen e = +2m.36s., i = +2m.59s. = S_g − 3s.
Long waves were also recorded at Hong Kong, Phu-Lien, Ekaterinburg, Vladivostok, Baku, Copenhagen, De Bilt, Strasbourg, and Stuttgart.

March 25d. Readings also at 0h. (near Tyosi, Mizusawa and Nagoya), 3h. (Baku (2), Tiflis, Ekaterinburg (2), Tchimkent, near Andijan (2), Samarkand (2), and near Medan), 4h. (New Plymouth, near Wellington, near Andijan, and near Nagoya and Tyosi), 5h. (New Plymouth, Samarkand, near Andijan (2), and near Wellington), 6h (near Andijan, and near Mizusawa (2)), 7h. (near Tyosi), 8h. (Mount Wilson, Pasadena, Tinemaha, La Paz, La Plata, and near Santiago), 9h. (Mizusawa, near Nagoya, and near Andijan), 10h. (Tchimkent, Andijan, and Samarkand), 12h. (La Paz), 13h. (Alicante), 14h. (Tyosi, and near Athens), 15h. (La Paz, Tchimkent, near Andijan, and Samarkand), 16h. (Andijan, Samarkand, Tchimkent, and near Apia), 17h. (near Manila), 18h. (Lick), 19h. (Mizusawa), 21h. (near Apia and near Mizusawa), 22h. (Berkeley, Branner, and Lick).

March 26d. 5h. 26m. 59s. Epicentre 38°·0N. 20°·5E. (as on 22d.). X.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		2·5	91	0 39	+ 3	(1 7)	+ 3	1·1	1·6
Taranto		3·5	316	1 1	P_g	1 59	S_g	—	—
Trenta		3·5	293	i 0 36	−14	i 1 21	− 9	—	—
Naples	E.	5·6	303	e 1 29	P*	e 2 59	S_g	—	3·4
Zagreb		8·5	338	e 1 59	− 1	e 3 45	+ 9	—	—
Florence		9·0	313	3 31	S	(3 31)	−18	(5·0)	7·0
Triest		9·1	329	e 2 13	+ 4	i 4 0	+ 9	—	—
Prato		9·2	312	e 3 28	S	(e 3 28)	−26	(5·0)	5·3
Vienna	Z.	10·6	345	—	—	e 4 21	− 7	—	—

Additional readings and notes :—
Florence gives S as P and L as S.
Triest iSS = +5m.6s., SSS = +5m.12s.
Prato gives S as P and L as S.
Long waves were also recorded at other European stations.

March 26d. 19h. 5m. 59s. Epicentre 42°·5N. 129°·0W. N.3.

A = −·464, B = −·573, C = +·676 ; D = −·777, E = +·629 ;
G = −·425, H = −·525, K = −·737.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ukiah		5·5	126	e 1 19	+ 1	—	—	—	—
Berkeley		7·0	129	e 1 37	− 2	—	—	—	—
Seattle		7·0	40	—	—	e 2 31	−28	—	—
Victoria	N.	7·1	32	1 48	+ 7	—	—	3·8	5·4
Branner		7·3	132	e 1 45	+ 1	—	—	—	—
Lick		7·6	130	e 1 49	+ 1	—	—	—	—
Haiwee		10·6	123	i 2 29	0	—	—	—	—
Mount Wilson	Z.	11·9	131	i 2 46	− 1	—	—	—	—
Pasadena		11·9	131	i 2 46	− 1	—	—	—	—
Riverside		12·5	129	i 2 53	− 2	—	—	—	—
La Jolla		13·4	132	i 3 9	+ 2	—	—	—	—
Sitka		15·1	346	3 23	− 7	(6 22)	+ 5	6·4	—
Tucson		17·6	120	e 4 14	+12	e 8 47	+92	e 9·4	—
Florissant		29·3	83	e 5 50	− 9	e 10 33	−20	—	—
Chicago		30·4	77	—	—	e 10 56	−14	e 16·8	—
Pittsburgh		36·3	76	—	—	e 12 29	−12	e 19·3	—

Additional readings :—
Florissant iE = +10m.53s.
Long waves were also recorded at Honolulu T.H., San Juan, Ivigtut, and other American and European stations.

March 26d. Readings also at 1h. (La Paz, Nagasaki, and near Nagoya), 2h. (Hastings, Nagasaki, and near Hukuoka), 3h. (Nagasaki and near Hukuoka), 4h. (Berkeley, Lick, and Tucson), 5h. (La Paz, near Kobe, Osaka, and Sumoto), 7h. (Tyosi and near Mizusawa), 8h. (Tyosi, Samarkand, Tchimkent, and near Andijan), 9h. (Ekaterinburg and Manila), 10h. (near Mizusawa and near Santiago), 11h. (Chiufeng and Tyosi), 13h. (near Mizusawa), 14h. (Medan, Mizusawa, and near Santiago), 15h. (Almata, near Andijan, and Tchimkent), 16h. (near Apia), 17h. (Riverview), 18h. (Mizusawa and near Tananarive), 22h. (Mizusawa).

March 27d. Readings at 8h. (near Hukuoka and near Tyosi), 10h. (Berkeley, Branner, and Lick), 11h. (San Juan), 12h. (Alicante and near Sumoto), 13h. (Berkeley (2), Branner (2), and Lick (2)), 15h. (near Mizusawa), 18h. (near Apia), 19h. (Hastings), 20h. and 22h. (Berkeley), 23h. (Mizusawa, Tyosi, and near Manila).

March 28d. 4h. 20m. 32s. Epicentre 58°·3N. 148°·9W. N.3.

A = −·450, B = −·271, C = +·851 ; D = −·517, E = +·856 ;
G = −·729, H = −·439, K = −·525.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		7·3	94	i 1 43	− 1	i 3 10	+ 4	3·8	—
Bozeman		26·0	102	e 4 58	−31	e 10 10	+12	e 14·0	—
Tinemaha	Z.	29·1	123	i 6 0	+ 3	—	—	—	—
Haiwee	E.	30·0	124	i 6 6	+ 1	—	—	—	—
Pasadena	Z.	31·7	126	6 19	− 1	—	—	—	—
Tucson		36·5	119	e 8 40	PP	e 12 56	+12	e 17·9	—
Madison		39·1	86	i 8 59	PP	i 16 19	SSS	—	—
Chicago		40·9	87	e 9 22	PP	e 17 14	?	e 19·4	—
Little Rock		43·7	98	e 7 41	−21	—	—	—	—
Pittsburgh		45·9	81	e 8 34	+14	—	—	e 23·1	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Harvard	49·1	73	—	—	e 17 4	?	e 25·6	—
Chiufeng	59·1	298	—	—	e 17 34	?	34·0	—
Pulkovo	62·0	0	i 10 18	0	18 35	− 7	31·5	41·6
Ekaterinburg	62·4	342	i 10 19	− 2	i 18 30	−17	27·5	33·2
Copenhagen	65·0	12	10 36	− 3	19 10	−10	33·5	—
De Bilt	67·6	17	10 57	+ 1	—	—	e 33·5	—
Strasbourg	71·4	16	e 10 28?	−51	—	—	e 42·5	—
Stuttgart	71·5	15	e 11 19	− 1	e 13 58	?	e 43·5	—
Tiflis	79·3	350	e 11 56	− 8	e 22 11	+ 3	e 40·2	45·6
Baku	80·1	346	e 12 10	+ 2	—	—	39·5	47·3

Additional readings :—
Bozeman e = +9m.34s.
Madison iP_cS = +13m.28s. =S +5s., eSS = +20m.33s. ; T_o = 4h.20m.34s.
Harvard e = +19m.4s. =SS −2s.
Strasbourg ePP = +12m.28s.?
Tiflis PPPZ = +17m.3s.
Baku e = +25m.24s. and +33m.44s.
Long waves were also recorded at Vladivostok, Hong Kong, Ivigtut, Ann Arbor, Cincinnati, East Machias, Edinburgh, Kew, and Uccle.

March 28d. 4h. 55m. 13s. Epicentre 38°·2N. 70°·9E. (given by the stations). N.3.

A = +·257, B = +·743, C = +·618 ; D = +·945, E = −·327 ;
G = +·202, H = +·584, K = −·786.

	△	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Andijan	2·8	24	e 0 40	0	i 1 13	+ 1	1·3
Samarkand	3·4	297	—	—	i 2 29	S*	—
Tchimkent	4·3	346	i 1 20	P_g	2 15	S_g	3·3
Almata	6·8	40	e 1 57	P*	—	—	—

March 28d. Readings also at 2h. (La Paz), 11h. (Wellington), 13h. (near Nagoya), 15h. (near Manila), 16h. (near Tyosi), 22h. (Balboa Heights and near Manila), 23h. (near Sumoto).

March 29d. Readings at 3h. (Nagasaki), 6h. (near Christchurch), 7h. (Hohenheim, Ravensburg, Strasbourg, Stuttgart, Neuchatel, Chur, near Zurich, near Kobe, near New Plymouth and Wellington), 8h. (Hohenheim, Ravensburg, Strasbourg, Stuttgart, near Chur, Neuchatel, Zurich, Samarkand, Tchimkent, and near Andijan), 9h. (Tucson and near Christchurch), 13h. (Nagoya and near Tyosi), 14h. (Tiflis), 16h. (Edinburgh), 18h. (Adelaide, Melbourne, Riverview, and Wellington), 20h. (San Fernando), 21h. (Mizusawa (2) and near Malabar).

March 30d. 7h. and 8h. Two shocks in the neighbourhood of the New Zealand stations, for which the readings are as follows :—

1)
Tuai P = 7h.17m.51s.?, S = 18m.9s., S_g = 18m.19s.
New Plymouth P = 7h.19m.23s., P_g? = 19m.47s., S? = 20m.13s.
Hastings P = 7h.19m.22s., S = 19m.50s., S_g = 20m.5s., M = 20m.7s.
Arapuni P = 7h.19m.40s., S = 20m.15s.
Wellington P = 7h.19m.45s., S = 20m.38s.
Takaka 7h.20m.
Christchurch P = 7h.20m.19s., S = 21m.36s.

(2)
Tuai P = 8h.34m.55s.?, S = 35m.23s.
Arapuni S = 8h.35m.40s.
Bunnythorpe P = 8h.36m.0s.?, S = 36m.26s., M = 36m.30s.
Takaka 8h.36m.
Wellington P = 8h.36m.9s., P_g? = 36m.14s., S = 36m.41s.
Hastings P = 8h.36m.15s., S = 36m.40s., S_g = 37m.5s., M = 37m.7s.
Christchurch P = 8h.36m.38s., S? = 37m.31s.
Dannevirke P? = 8h.37m.2s.?, S = 37m.32s.

March 30d. 20h. Epicentre in Central Asia, for which the readings are as follows :—

Samarkand eP =20h.40m.0s.
Andijan eP =20h.42m.5s.
Tashkent e =20h.42m.14s. and 44m.58s., eL =45m.42s., M =47m.12s.
Tchimkent eP =20h.42m.20s.
Almata eP =20h.43m.22s.
Tiflis eE =20h.44m.12s. and 45m.0s., LE =55m.
Bombay eE =20h.45m.0s., eN =46m.0s.
Ekaterinburg iP =20h.45m.5s., e =49m.59s. and 52m.59s., L =55m., M =56m.0s.
Pulkovo P =20h.46m.18s., L =21h.3m., M =6m.0s.
Hyderabad P =20h.47m.26s., S =48m.7s., L =49m.24s., M =50m.18s.
Calcutta P =20h.47m.46s., S =50m.14s., L =51m.42s.
Ksara eP =20h.48m.25s., eS =52m.1s.
Long waves were recorded at some European stations.

March 30d. Readings also at 6h. (near Nagoya), 9h. (Lick), 10h. (Edinburgh), 12h. (Branner, Tucson, Huancayo, and near Tyosi), 14h. (near Prato), 17h. (Wellington, La Paz, Sucre, and Hukuoka), 18h. (Ekaterinburg, Kucino, San Juan, and near Mizusawa), 23h. (Andijan).

March 31d. 21h. 59m. 36s. Epicentre 36°·8N. 97°·4E. N.2.

A = −·103, B = +·794, C = +·599 ; D = +·992, E = +·129 ;
G = −·077, H = +·594, K = −·801.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Chiufeng	E.	15·0	71	e 3 35	+ 7	e 7 59	?	—	—
Calcutta		16·2	211	3 15	−29	6 35	− 8	8·3	—
Almata		16·9	299	e 5 52	?	—	—	—	—
Phu-Lien		17·9	151	3 24?	−41	—	—	9·4	—
Nanking		18·2	99	e 4 11	+ 2	e 9 29	?	11·3	—
Agra	E.	19·0	245	4 20	+ 1	7 53	+ 7	10·5	12·6
Andijan		19·9	289	e 4 31	+ 2	—	—	—	—
Hong Kong		20·5	130	4 34	− 1	8 35	SS	10·6	13·0
Zi-ka-wei	Z.	20·6	99	4 37	+ 1	8 37	+19	12·4	13·1
Tchimkent		22·0	293	e 4 59	+ 8	—	—	—	—
Tashkent		22·2	290	i 4 45	− 8	e 8 52	+ 2	12·5	14·0
Zinsen		23·2	79	e 5 4	+ 1	e 8 29	PcP	e 12·7	—
Keizyo		23·5	79	e 4 58	− 7	e 9 27	+13	e 13·1	—
Samarkand		23·9	286	e 2 54	?	—	—	—	—
Hyderabad		25·6	226	6 14	+49	10 4	+13	12·1	15·6
Vladivostok		27·0	66	e 4 39	−59	e 10 43	+28	—	16·5
Bombay		28·0	237	5 48	+ 1	10 34	+ 2	15·1	15·7
Manila		30·6	130	12 23	SS	16 4	?	18·0	20·0
Baku		36·9	291	—	—	e 13 0	+ 10	23·0	24·0
Tiflis		40·4	293	e 7 35	0	e 13 56	+14	25·1	30·1
Pulkovo		47·6	321	8 32	− 1	—	—	25·4	28·7
Helsingfors		50·2	322	—	—	e 19 24	SS	e 28·9	—
Potsdam		58·5	315	—	—	e 22 48	?	e 28·0	31·4
Triest		60·6	307	—	—	e 24 40	SSS	e 31·4	—
Stuttgart		62·2	311	e 10 18	− 2	—	—	e 32·4	38·4
Florence		63·0	306	—	—	e 21 24	?	—	34·4
Paris		66·0	314	—	—	e 24 24?	?	35·4	40·4

Additional readings :—
Keizyo iE = +5m.7s. =PP −23s.
Baku e = +18m.42s.
Tiflis eE = +9m.11s. =PP +7s., +16m.59s. =SSS +4s. and +19m.18s.
Potsdam eZ = +23m.24s.
Long waves were also recorded at Kodaikanal and other European stations.

March 31d. Readings also at 1h. (Greymouth, near Christchurch, Wellington, and near New Plymouth), 3h. (near Medan), 5h. (Berkeley, Lick, and Huancayo), 6h. (San Juan, Mount Wilson, Pasadena, and near Apia), 7h. (Berkeley, Branner, Lick, Hastings, and near New Plymouth), 8h. (Wellington and near Batavia), 9h. (near Mizusawa, Nagoya, and Tyosi), 11h. (San Juan and near Mizusawa), 12h. (Ksara, Neuchatel, Triest, Zagreb, and near Athens), 13h. (Strasbourg and Stuttgart), 15h. (near Santiago), 17h. (near Apia), 19h. (Chur and near Triest), 21h. (near Mizusawa).

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