The International Seismological Summary for 1924 October, November, December.

FORMERLY THE BULLETIN OF THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

The present number of the Summary deals with 100 epicentres, 34 of which are new and 66 repetitions from old epicentres. It concludes the seventh year of the Summary (1918-1924), and the material thus collected has been discussed, firstly for corrections to the adopted tables of P and S, and secondly for fluctuations in seismic activity. The results of the former discussion have been published in the Geophysical Supplement to the Monthly Notices R.A.S., I. 8, Dec., 1926, and copies have been distributed along with a recent number of this Summary; the latter discussion is not yet completed.

Cases of abnormal focus are noted on :—

Date.			Epicentre.		Focal Depth.
	d.	h.	°	°	
1924 Oct.	8	20	30·5N.	91·0E.	+0·010
Oct.	13	16	37·0N.	72·0E.	+0·030
Dec.	27	11	45·0N.	143·0E.	+0·010

Attention may be called to a case of special difficulty on December 26d. 23h., probably owing to the overlapping of waves from three or more separate shocks.

In *The Times* for 1924, December 30, four photographs were reproduced of the "Earthquake in Central Java," showing the ruins of Wonosobo, "which was devastated in the middle of November by a severe earthquake. Not a single building escaped undamaged and a death roll of 600 was reported. It was the worst earthquake experienced in Java for 30 years." The seismographic observations do not give a very clear indication of the epicentre, and Wonosobo has been adopted from this macroseismic evidence. (Nov. 24d. 7h. 58m. 48s.).

A few notes from steamers given in the *Bulletin Volcanologique*, or the Washington *Seismological Despatches* may be given here chiefly for the reason that it seems difficult to assign most of them to any serious shock in this or the preceding number of the Summary :—

1924 July 21d. : Christchurch, N.Z. Steamer *Tees*, which arrived at Lyttelton last night, reports having encountered a tidal wave July 21d. while on a voyage to the Chatham Islands. The top of the high pressure cylinder was cracked, and it was decided to proceed on the low pressure and intermediate. On the night that the *Tees* was disabled the same tidal wave struck the island and considerable damage was done.—(*Bull. Volcan.*, Nos. 3 and 4, 1925).

1924 Sept. 16d. : S.S. *Empress of Australia* (at sea), lat. 51°50′N. long. 166°54′W. When in latitude, as above, a very severe vibration fore and aft was felt, accompanied by a rumbling, rattling noise similar to an anchor being let go into the deep water. Fearing trouble in the engine-room, I communicated with the chief engineer at once and was assured that everything was in order below, so as there was no visible or theoretical explanation of the matter I came to the conclusion that it was an earthquake shock.—G.M.T. 14h. 23m.

1924 Sept. 23d. : S.S. *Empress of Australia* (at sea), lat. 41°·21′N. long. 147°·15′E., at 9h. 27m., apparent ship time, we experienced shock more severe than already reported. This was accompanied by very loud rumbling noise, together with a very severe vibration of the ship, which lasted 5 sec.—Georgetown Seismol. despatches.

1924 Nov. 1d. : Large volcanic explosion has occurred on the sea bottom near the Yacyama Islands, between Formosa and the Loochoo Islands. Report originated with the Captain of the O.K.S. steamer *Mayako Maru*, which was forced to steam astern to escape boiling muddy water with large pumice stones, etc. The Captain declared that the length of the explosion was 12 miles, but was unable to ascertain its width.

Nicaragua : A strong earthquake occurred last night (Oct. 31) ; is believed to have been the cause of the activity of the Ometepe Island Volcano, in Lake Nicaragua, about 20 miles from here.—(Georgetown Seismol. despatches).

The following letter about the establishment of three Danish stations will be read with great interest :—

Gradmaalingen,
Proviantgaarden—Copenhague, K.,
1927 December 22d.

Dear Sir,

I have the pleasure to forward to you the first bulletin of the Seismological Station Kobenhavn (Copenhagen, Denmark). The station, which belongs to the Danish Geodetic Institute, is situated at 55°·41′N. 12°·27′E., and is equipped with Wiechert, Galitzin, and Milne-Shaw instruments as well as with American torsion seismometers. Another Danish Seismological Station equipped with Wiechert instruments has been erected by the Institute at Ivigtut in south-western Greenland, at 61°·12′N. 48°·11′W.; this station has been working since September this year. A third station is being erected at Scoresby-Sund, on the east coast of Greenland, at 70°·29′N. 21°·57′W., and will be equipped with a complete set of Galitzin instruments. The bulletins of our two Greenland Stations will be sent to you when they are issued.

Yours sincerely,
N. E. Norlund.

It will be some 18 months or 2 years before the Summary reaches the dates covered by these new stations, but the information given by them should be of the greatest value for the study of earthquakes in high latitudes. Meanwhile Professor Norlund has begun to send us prompt news of any large shock, as, for instance, that of 1928 January 6d. in Central Africa, for which we have also news from another new station near the epicentre, Entebbe, where the shock was "easily felt, especially by those at a meeting of the Uganda Literary and Scientific Society at the Entebbe Club. It may have been felt more decidedly there because the meeting was held in a room which is partly at the height of a second storey." But perhaps the most valuable part of the report concerns the behaviour of the seismograph before the shock.

For some days before the shock tilt had been so much in evidence that the hourly lines of the record were either congested or too wide. It is not *clear* that this behaviour was related to the coming shock, but taken in connection with what Professor Imamura told us of changes of level preceding the great Japan shock of 1923 September 1d.—see p. 133 of this Summary—where, however, the tilting was not alternating, but in one direction, it

suggests that such changes may perhaps foretell a shock. The Entebbe observers place the epicentre in the Rift Valley area, north of Nairobi. The P. phase was recorded at 19h. 32m. 50s. G.M.T., but then the violence of the shock threw the instrument out of gear. The following provisional solution may be adventured from a few observations to hand :—

1928 Jan. 6d. 19h. 31m. 40s. Epicentre 0°·5S. 37°·0E.

A=+·799, B=+·602, C=−·009.

	Δ	P.	O−C.	S.	O−C.
	°	m. s.	s.	m. s.	s.
Entebbe	4·6	1 10	− 1	—	—
Helwan	30·8	6 23	−13	11 42	−6
De Bilt	59·0	10 10	+ 5	—	—
Copenhagen	59·7	10 13	+ 3	18 12	−7
Kew	60·8	10 21	+ 3	18 42	+9
Oxford	61·4	10 33	+12	18 48	+7

The information from Helwan is interesting. The Director writes :—

" S, I think, must be at 19h. 43m. 22s. This agrees fairly well with M. There is a similar point at 19h. 42m. 25s., but this puts M too early."

It will be seen that Mr. Curry has correctly identified S, but the " similar point at 19h. 42m. 25s.," or nearly a minute before the real S, perhaps helps to explain why the residuals for S show a double maximum : See the discussion given in *Geoph. Supp. to Mon. Not.*, I. 8, p. 443 (Dec. 1926). It will be seen that for Δ=30°·8 one maximum falls at about −3s., and the other at about −25s. The interval is much shorter than a minute, so that in this case there is no difficulty in rejecting the spurious S ; but possibly the interval varies (we can scarcely tell until we know what causes the spurious S) and thus leads to confusion with S when the interval is short.

Reasons for delay in publication are only too well known to all Directors of Observatories ; and when we get such a volume as the *Bolletino Sismico, Anno* 1918, just issued from Rome with the date 1927, we can only say with thankfulness " Better late than never." Much of the information contained in it has already been kindly furnished in advance and utilised in the *International Summary*. In return, the places of epicentres found in the

Summary have been entered in the final column of remarks (in the volume of Microsismi), though not the times at origin. But seeing that there has thus apparently been time to add these details since the *Summary* was published, would it not have been possible to scrutinise, and perhaps revise, some of the readings in doubt? A single example will perhaps suffice to illustrate the point. On 1918 Mar. 24d. 23h. 14m. 54s. there was a shock with epicentre 34°·5N. 57°·1E., for which the Moncalieri observation is given in the *Summary* as follows :—

	Δ	Az.	P.	O—C.	S.	O—C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Moncalieri	38·8	301	7 45	+1	16 51	?SR_1	23·7	29·7

Now the above-mentioned volume accepts the epicentre given; but prints the observation of S as before without any comment, though it is clear that it cannot be S if the epicentre is correct and the P is correct. Advance in accurate knowledge will be slow unless there can be more revision of doubtful cases.

The following sentences extracted from the *Proc. Imp. Acad. of Japan* for November, 1927 (Vol. III, p. XXII), remind us that the consequences to humanity of the great earthquake of Sept. 1d., 1923, are still appearing and will no doubt continue to do so for many years :—

By the death of Bunyiu Nanjio, Hon. M.A. (Oxon.), D.Litt. (Tokyo 1849-1927), which occurred on the 9th of November, the Academy has lost a distinguished member and the Buddhist circle a highly respected leader . . . . He went to London and later to Oxford and studied Sanskrit under Prof. Max Müller, 1876-84. His name became so familiar to us through his great work " A Catalogue of the Chinese Translation of the Buddhists Tripitaha, the Sacred Canon of the Buddhists of China and Japan," published in 1883 at Oxford. For this distinguished service Oxford University conferred upon him the honorary degree of M.A. . . . . In 1923 he published the Sanskrit text of the Lanka-avatara-sutra and a Japanese translation of that text. The great earthquake of the same year was a disastrous blow to him. He not only lost all his property, including house, books, and personal effects, but the incident privations and hardships shattered his health. He was laid up ever since. While in bed he wrote his autobiographical notes covering the whole period of his life, which were finished and published a few weeks prior to his lamented decease.

The following sentences are extracted from the account of a careful investigation of the rates of two Riefler Clocks during the years 1916-1924 by N. Dneprovsky. (*Bull. de l'Obs. Central a Poulkovo*, Vol. XI, I, p. 72) :—

" In two cases of breaks in rate we seem justified in regarding them as a result of more or less strong earthquakes. But on other days when discrepancies occurred there either were no earthquakes or they were very distant and faint, the dislocation of the soil not exceeding 10μ, as recorded by the Seismological Station at Poulkovo. On the other hand, I examined the daily rates of clocks in periods of very strong earthquakes, more than 300μ, which were registered for the period of nine years. Even during the catastrophical earthquakes, as the one of Japan, September 1st, 1923, or Kamchatka, January 20, 1917, when the displacement of 1mm. to 2mm. affected all three components, it was impossible to detect any considerable change in the rate of the clocks, neither on the days when the earthquakes occurred nor on the following ones. Perhaps we may explain this by the fact that the distant earthquakes take generally a long period (12sec. and more) and the oscillations (about 1 hour) are of a rather smooth character. Local earthquakes in Poulkovo never occur."

H. H. TURNER.

University Observatory, Oxford.
1928, February 15.

1924 OCTOBER, NOVEMBER, DECEMBER.

Oct. 1d. Readings at 4h. (Apia), 6h. (Mizusawa and near Sinj), 7h. (near Athens), 8h. (Ekaterinburg and near Taihoku), 9h. (Ekaterinburg), 16h. (near Mizusawa), 19h. (La Paz).

Oct. 2d. 16h. 31m. 48s. Epicentre 37°·0N. 138°·5E. (as on 1923 Jan. 14d.).

$A = -\cdot599$, $B = +\cdot529$, $C = +\cdot602$; $D = +\cdot663$, $E = +\cdot749$; $G = -\cdot451$, $H = +\cdot399$, $K = -\cdot799$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagoya		2·2	214	0 25	− 9	(0 58)	− 2	1·0	1·3
Mizusawa	E.	2·9	44	0 45	0	1 20	0	—	—
Osaka		3·5	227	1 7	+12	—	—	2·0	2·5
Kobe		3·6	230	0 58	+ 2	—	—	2·0	2·1

Additional readings: Nagoya MN = +1·2m. Mizusawa SN = +1m.19s. Osaka MN = +2·4m.

Oct. 2d. Readings also at 1h. (Melbourne and Ekaterinburg), 2h. (La Paz), 3h. (Ekaterinburg), 4h. (Nagoya), 7h. (La Paz), 14h. (Irkutsk), 15h. (Irkutsk, Bombay, and Hyderabad), 16h. (Pulkovo and Ekaterinburg), 18h. (Ekaterinburg), 19h. (near Mizusawa).

Oct. 3d. Readings at 0h. (Nagoya), 2h. (near Batavia and Malabar), 3h. (near La Plata), 8h. (Florence and near Wellington), 11h. (Rocca di Papa), 14h. (Irkutsk), 18h. (Irkutsk and near Mizusawa), 19h. (Ksara).

Oct. 4d. 6h. 41m. 6s. Epicentre 15°·0N. 44°·0E.

$A = +\cdot695$, $B = +\cdot671$, $C = +\cdot259$; $D = +\cdot695$, $E = -\cdot719$; $G = +\cdot186$, $H = +\cdot180$, $K = -\cdot966$.

Rough.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ksara	E.	20·2	340	4 41	− 2	8 24	− 3	10·8	—
Bombay		27·8	78	—	—	—	—	12·9	—
Hyderabad		33·1	81	e 12 23	?S	(e 12 23)	− 3	—	—
Algiers		42·3	309	—	—	—	—	e 21·6	28·1
Ekaterinburg		43·8	13	i 8 28	+ 4	15 4	+ 5	22·9	—
Granada		47·5	307	—	—	—	—	e 28·1	31·4

Algiers gives also L = +26·1m.

Oct. 4d. Readings also at 8h. (near Athens), 19h. (Nagasaki), 23h. (Ekaterinburg).

Oct. 5d. 12h. 56m. 6s. Epicentre 20°·6S. 168°·8E. (as on 1921 Dec. 2d.).

$A = -\cdot918$, $B = +\cdot182$, $C = -\cdot352$; $D = +\cdot194$, $E = +\cdot981$; $G = +\cdot345$, $H = -\cdot068$, $K = -\cdot936$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	20·5	226	i 4 52	+ 5	i 8 44	+10	e 11·5	13·0
Sydney	20·5	226	4 30	−17	—	—	11·6	12·9
Wellington	21·3	168	i 5 0	+ 3	i 8 54	+ 4	10·3	11·7
Perth	48·3	245	5 52	−184	13 23	−155	22·5	—
Batavia	61·6	275	—	—	i 18 23	−20	—	—
Colombo	91·4	277	23 24	?S	(23 24)	[−12]	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria		91·7	38	—	—	(23 41)	[+ 3]	—	23·7
Irkutsk		91·8	326	e 23 16	?S	(e 23 16)	[−23]	40·9	—
Chicago	N.	113·5	51	—	—	—	—	45·9	—
Ann Arbor		116·5	50	—	—	(e 29 54)	+92	41·9	—
Ekaterinburg		117·0	324	e 18 36	[− 8]	25 15	[−20]	—	—
Georgetown		121·3	55	—	—	e 35 51	?	—	—
Ottawa	E.	122·3	47	—	—	e 30 56	?	60·9	—
Pulkovo		131·1	334	i 22 11	?PR_1	—	—	60·4	68·8
Vienna	Z.	144·6	329	e 22 58	?PR_1	—	—	—	—
De Bilt		146·1	340	e 19 33	[−17]	—	—	e 68·9	—
Strasbourg		148·2	334	e 19 32	[−21]	—	—	e 76·9	—
Paris		149·7	342	—	—	—	—	48·9	—
Rocca di Papa		150·8	322	e 19 47	[−10]	—	—	—	—

Additional readings: Apia (Δ = 19°·7) gives 12h.38m. Riverview iP = +4m.59s., PS = +8m.52s., and +9m.12s., MN = +13·2m. Pulkovo MZ = +68·9m.

Oct. 5d. 13h. 21m. 30s. Epicentre 35°·5N. 141°·0E. (as on 1923 Nov. 21d.).

A = −·633, B = +·512, C = +·581; D = +·629, E = +·777; G = −·451, H = +·365, K = −·814.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagoya		3·4	265	0 42	−11	(1 25)	− 9	1·4	2·0
Mizusawa	E.	3·6	1	1 8	+12	2 1	+22	—	—
Osaka		4·6	261	1 21	+10	—	—	2·4	2·7
Kobe		4·9	262	1 15	− 1	(2 20)	+ 6	2·3	2·7
Ekaterinburg		55·9	319	i 9 41	− 4	17 25	− 8	27·5	35·9

Additional readings: Mizusawa PN = +1m.9s. Osaka MN = +3·4m. Kobe MZ = +2·6m., MN = +2·8m. Ekaterinburg MN = +31·1m., MZ = +36·0m.

Oct. 5d. Readings also at 0h. (Ekaterinburg), 6h. (Sydney and La Paz), 8h. (La Paz), 9h. (Pulkovo and near Athens), 13h. (Georgetown, near Osaka, and Mizusawa), 14h. (Nagoya), 15h. (Nagoya and near Mizusawa and Sapporo), 23h. (Nagasaki).

Oct. 6d. 6h. 22m. 30s. Epicentre 12°·2S. 118°·0E. (as on 1921 Jan. 24d.).

A = −·459, B = +·863, C = −·211; D = +·883, E = +·470; G = +·099, H = −·187, K = −·977.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Malabar	11·4	295	i 2 45	− 5	i 4 48	−16	—	—
Batavia	12·5	297	i 3 2	− 4	i 5 51	+19	e 8·8	—
Perth	19·8	185	4 52	+13	8 14	− 5	12·4	17·0
Manila	26·9	6	e 7 30	?	—	—	—	—
Riverview	37·1	131	—	—	—	—	e 20·1	24·7
Bombay	54·3	304	e 8 25	−70	16 51	−22	—	—

Additional readings: Perth L = +14·6m. and +16·0m. Riverview MN = +22·8m.

Oct. 6d. Readings also at 3h. (near Taihoku), 6h. (Fordham), 8h. (Ekaterinburg), 9h. (Zi-ka-wei and near Mostar), 11h. (Ekaterinburg), 14h. (Azores), 15h. (Nagasaki), 17h. (near Tacubaya), 18h. (near Taihoku), 20h. (Balboa Heights), 22h. (Victoria, Ottawa, Toronto, and Perth).

Oct. 7d. **Readings at 0h. (Ekaterinburg), 2h. (near Tacubaya), 6h. (La Paz), 14h. (near Mizusawa), 16h. (Apia and near Tacubaya), 20h. (Rio de Janeiro, Zi-ka-wei, and near Taihoku), 21h. (Ekaterinburg), 23h. (Rio Tinto).**

1924. Oct. 8d. 20h. 32m. 52s. Epicentre 30°·5N. 91°·0E.

(as on 1921 Oct. 14d.).

A = −·015, B = +·861, C = +·508 ; D = +1·000, E = +·017 ; G = −·009, H = +·508, K = −·862.

A depth of focus 0·010 has been assumed. See the note at the end.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	N.	−0·1	8·4	197	1 55	−11	3 38	− 7	5·4	5·7
Dehra Dun		−0·1	11·2	272	2 26	−20	(4 47)	−10	4·8	5·8
Simla	E.	−0.1	11·9	277	2 44	−12	4 44	−30	6·1	7·5
	N.	−0·1	11·9	277	2 50	− 6	4 50	−24	6·1	6·3
Hyderabad		−0·3	17·4	224	i 3 56	−10	7 4	−16	7·6	9·6
Bombay		−0·4	20·2	239	4 30	− 9	7 58	−21	9·8	—
Hong Kong		−0·5	22·3	106	5 13	+10	9 28	+27	—	13·1
Irkutsk		−0·5	23·8	20	i 5 17	− 3	i 9 34	+ 3	12·1	—
Kodaikanal		−0·5	23·9	215	8 56	?S	(8 56)	−37	12·6	45·5
Colombo		−0·5	25·8	206	5 20	−21	10 50	?SR_1	14·3	22·8
Zi-ka-wei		−0·5	26·0	81	e 5 51	+ 8	e 10 21	+ 8	—	17·0
Taihoku	E.	−0·6	27·5	94	—	—	—	—	12·4	19·0
Manila		−0·7	31·8	114	e 7 8?	+29	—	—	15·1	—
Ekaterinburg		−0·8	33·7	330	6 35	−21	i 11 50	−32	14·6	—
Kobe		−0·8	37·0	71	—	—	—	—	—	11·8
Osaka		−0·8	37·4	75	15 24	?SR_1	—	—	19·6	23·1
Batavia		−0·8	39·7	155	e 7 40	− 5	—	—	20·4	—
Mizusawa	N.	−0·8	41·5	65	—	—	—	—	21·5	—
Ootomari		−0·9	42·6	54	20 15	?L	—	—	23·2	27·4
Kucino		−0·9	44·7	321	i 8 29	+ 5	14 57	− 2	21·2	28·0
Ksara	E.	−0·9	46·2	289	8 24	−11	14 57	−22	25·7	—
Pulkovo		−1·0	49·4	326	8 45	−11	15 42	−17	26·1	30·5
Helwan		−1·0	50·9	284	e 8 55	−11	16 1	−17	—	32·5
Konigsberg		−1·1	54·4	320	9 25	− 3	17 1	+ 1	e 26·0	36·0
Upsala		−1·1	55·7	325	e 9 34	− 3	e 17 16	0	e 27·1	34·5
Belgrade		−1·1	55·8	306	i 2 53	?	e 7 57	?	e 23·1	—
Vienna		−1·2	57·9	312	10 52	+62	17 43	+ 1	e 29·1	37·6
Hamburg		−1·2	60·8	319	e 10 8?	− 1	i 18 25	+ 7	e 31·1	40·8
Pompeii		−1·2	61·0	302	e 11 8	+57	e 19 8	+47	—	—
Venice		−1·2	61·2	310	—	—	—	—	33·1	—
Innsbruck		−1·2	61·4	312	e 10 18	+ 5	—	—	e 31·1	—
Bergen		−1·2	61·7	327	—	—	—	—	i 30·1	—
Rocca di Papa		−1·2	62·1	304	10 19	+ 1	17 50	−45	e 34·6	43·5
Florence		−1·2	62·4	309	10 23	+ 3	18 38	0	—	35·3
Zurich		−1·2	63·2	311	e 10 27	+ 2	e 18 44	− 4	—	—
Strasbourg		−1·2	63·4	313	e 10 30	+ 4	e 18 51	0	e 33·1	42·5
De Bilt		−1·2	64·0	318	—	—	e 19 9	+11	e 34·1	39·9
Moncalieri		−1·2	64·5	310	12 50	+136	21 18	+133	36·6	41·4
Uccle		−1·2	64·8	317	e 10 37	+ 1	e 19 11	+ 3	e 29·1	36·9
Besançon		−1·2	64·9	312	—	—	e 19 16	+ 7	e 26·1	36·1
Dyce		−1·2	66·3	325	—	—	19 34	+ 8	32·8	38·3
Paris		−1·2	66·6	315	e 10 45	− 2	e 19 30	0	27·1	43·1
Kew		−1·2	67·3	319	—	—	—	—	—	40·1
Edinburgh		−1·2	67·3	322	—	—	i 19 39	+ 1	33·1	39·0
Eskdalemuir		−1·2	67·5	322	—	—	—	—	31·1	38·2
Stonyhurst		−1·3	67·7	320	14 38	?PR_1	19 46	+ 4	40·7	—
Oxford		−1·3	67·8	319	11 4	+ 9	i 19 48	+ 4	34·1	41·8
Bidston		−1·3	68·2	320	19 43	?S	(19 43)	− 6	30·2	43·8
Barcelona		−1·3	69·5	308	—	—	e 27 44	?SR_2	e 37·1	44·7
Algiers		−1·3	70·8	303	e 11 6	− 8	e 20 18	− 2	e 26·1	50·1
Tortosa	E.	−1·3	70·9	308	—	—	20 24	+ 3	e 34·8	48·2
	N.	−1·3	70·9	308	e 10 59	−16	20 23	+ 2	35·2	44·4
Toledo		−1·3	74·5	309	e 11 34	− 3	e 21 8	+ 4	e 28·8	41·2
Granada		−1·3	75·4	306	e 11 18	−25	i 20 22	−53	28·7	43·3
Rio Tinto		−1·3	77·2	308	33 8	?L	—	—	(33·1)	35·1
San Fernando		−1·3	77·6	306	—	—	21 39	− 2	42·1	49·1

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.
Lisbon		−1·3	78·5	309	—	—	—	—	e 38·1	—
Melbourne		−1·4	84·9	141	—	—	e 23 8	+ 5	—	55·1
Riverview		−1·4	85·8	135	e 23 28	?S	(e 23 28)	+16	e 39·9	54·7
Cape Town		−1·4	94·0	232	—	—	—	—	—	54·4
Victoria	E.	−1·4	95·2	22	14 3	+26	31 18	?SR_1	48·7	59·2
	N.	−1·4	95·2	22	14 6	+29	—	—	47·1	59·0
Ottawa		—	103·1	352	e 24 37	?S	(e 24 37)	[− 1]	e 45·6	54·1
Toronto	E.	—	105·3	352	—	—	e 24 38	[−11]	60·4	—
Harvard		—	105·3	349	—	—	—	—	e 60·1	—
Ithaca		—	106·1	352	—	—	—	—	52·1	—
Ann Arbor		—	107·0	357	—	—	e 32 20	—	52·1	66·6
Fordham		—	107·2	350	e 14 8	−37	—	—	62·3	63·1
Chicago		—	107·7	358	i 25 7	?S	(i 25 7)	[+ 7]	49·6	—
La Paz		—	156·4	302	e 20 38	[+34]	—	—	75·1	82·6

Additional readings and notes: Dehra Dun S = +3m.27s. Zi-ka-wei PS = +10m.58s., MN = +15·2m. Osaka MN = +21·2m. Batavia L = +25·8m. Ootomari MN = +24·3m. Kucino PR_1 = +10m.8s., SR_1 = +18m.27s. Ksara PR_1 = +10m.12s.; T_o = 20h.32m.53s. Pulkovo PR_1 = +10m.39s., SR_1 = +19m.20s., SR_2 = +24m.20s., MN = +28·5m. Helwan PR_1 = +10m.56s. Konigsberg SR_1 = +21m.2s., MN = +31·5m. Upsala MN = +33·5m. Vienna PR_1 = +12m.23s., PS = +18m.26s., SR_1 = +21m.56s. Hamburg eSR_1 = +23m.8s., MN = +35·3m. Venice reading has been increased by 1h. Bergen e = +34m.8s., iZ = +37m.8s. Rocca di Papa eN = +10m.9s., eE = +10m.16s., PN = +10m.20s., eL = +22·8m. Strasbourg MN = +41·8m. Moncalieri L = +28·8m. Paris iP = +10m.49s., MN = +34·1m. Eskdalemuir MN = +37·2m. Oxford SR_2 = +27m.44s. Bidston S = +27m.18s. Toledo iZ = +11m.36s., MZ = +49·2m. Granada i = +11m.40s., PR_1 = +13m.49s. San Fernando SR_1 = +30m.47s., MN = +55·1m. Riverview eS? = +29m.44s., MN = +45·4m. Ottawa PR_1E = +25m.46s., eSN = +30m.27s., eSR_1N = +32m.50s. Toronto eN = +26m.4s., eE = +29m.54s. and 33m.18s., eN = +33m.20s. Chicago PR_1 = +25m.56s., S = +31m.50s., LN = +59·7m.

NOTE TO OCT. 8d. 20h.

In the absence of supporting evidence from the antipodes, the assumption of a deep focus correction requires special justification.

Taking the principal stations arranged in azimuth we have the following table:

No. of Stns.	Az.	Equation.	Without deep focus correction. Obs.	Col.	Diff.	With deep focus correction. Obs.	Col.	Diff.
	°							
1	18	+ ·31x + ·95y =	−0·6	−0·6	0·0	−0·1	+0·3	−0·4
2	90	+1·00x =	+0·4	+0·8	−0·4	+0·8	+0·8	0·0
2	145	+ ·57x − ·82y =	−0·8	+1·2	−2·0	+0·4	+0·4	0·0
3	225	− ·71x − ·71y =	−0·9	0·0	−0·9	−0·7	−0·6	−0·1
27	312	− ·74x + ·67y =	−1·4	−1·2	−0·2	−0·2	−0·5	+0·3

The solutions being

Without deep focus x = +0°·8 y = −0°·9
With deep focus x = +0°·8 y = +0°·1

It thus appears that the epicentre should be about 1° further West (38°·5N. 90°·0E.).

Oct. 8d. Readings also at 4h. (near Taihoku), 5h. (Zi-ka-wei. Ekaterinburg, and La Paz), 7h. (Apia and Nagasaki), 8h. (Ekaterinburg, Nagasaki, and Bombay), 13h. (near Nagoya), 14h. (Kobe and near Osaka and Mizusawa), 20h. (Perth).

Oct. 9d. Readings at 3h. (La Paz), 5h. (Pulkovo, Ekaterinburg, Hamburg, and near Vera Cruz, and Tacubaya), 6h. (Eskdalemuir), 16h. (Apia), 22h. (near Victoria).

Oct. 10d. 9h. 21m. 4s. (I) } Epicentre 71°·7N. 17°·0W.
16h. 5m. 20s. (II) }

A = +·300, B = −·092, C = +·949 ; D = −·292, E = −·956 ;
G = +·908, H = −·278, K = −·314.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Edinburgh	16·8	152	—	—	—	—	e 7·9	—
I	Upsala	18·1	113	e 4 22	+ 4	—	—	e 8·9	—
I	Hamburg Z.	21·5	133	e 4 56	− 3	—	—	—	—
I	De Bilt	21·9	142	5 5	+ 1	9 6	+ 3	e 10·4	12·5
II		21·9	142	—	—	—	—	e 11·7	—
I	Pulkovo	22·0	98	5 4	− 1	9 5	0	10·9	13·1
II		22·0	98	5 6	+ 1	e 9 9	+ 4	10·7	—
I	Uccle	23·0	144	e 5 17	0	e 9 20	− 5	e 10·9	—
I	Paris	24·6	148	—	—	—	—	12·9	—
II		24·6	148	—	—	—	—	e 13·7	—
I	Strasbourg	25·8	140	e 5 46	0	—	—	e 13·9	15·9
II		25·8	140	e 5 48	+ 2	—	—	e 13·7	16·7
II	Moncalieri	29·2	143	e 8 52	—	14 49	?L	20·6	—
I	Rocca di Papa	33·3	138	6 22	−37	—	—	—	8·1
I	Ekaterinburg	33·8	75	e 7 3	0	e 12 41	+ 3	15·9	19·7
II		33·8	75	7 4	+ 1	e 12 38	0	16·7	—
I	Ottawa	37·8	260	—	—	—	—	e 19·9	—
II		37·8	260	—	—	—	—	e 20·7	—
I	Toronto E.	40·5	263	—	—	—	—	e 23·2	—
I	Chicago E.	44·7	270	—	—	—	—	25·4	—
I	Victoria E.	49·3	303	—	—	—	—	28·8	30·2
II		49·3	303	—	—	—	—	34·2	42·2
I	Apia	120·2	331	22 56	?PR_2	—	—	—	—

Additional readings: De Bilt I MN = +13·3m., MZ = +13·6m. Rocca di Papa I PR_1E = +6m.48s., PR_1N = +7m.10s., MN = +7·8m. Ekaterinburg I i = +7m.6s. Victoria I MN = +30·9m., II MN = +31·3m.

Oct. 10d. Readings also at 0h. (Apia), 6h. (near Kobe), 17h. (La Paz), 21h. (Ottawa, Toronto, Zi-ka-wei, near Taihoku, and near Oaxaca, Vera Cruz, Tacubaya, and Merida), 22h. (Ekaterinburg).

Oct. 11d. Readings at 0h. (La Paz and Innsbruck), 3h. (Fordham and near La Paz), 4h. (Manila), 5h. (Ekaterinburg), 8h. (near Taihoku), 9h. (near Tacubaya), 13h. (La Paz, Irkutsk (2)), 14h. (Manila), 19h. (Ekaterinburg and Irkutsk), 23h. (Ksara).

1924. Oct. 12d. 19h. 34m. 0s. Epicentre 1°·2S. 29·°6W.

A = +·869, B = −·494, C = −·021 ; D = −·494, E = −·870 ;
G = −·018, H = +·010, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Rio de Janeiro		25·4	210	—	—	—	—	12·2	—
Azores		39·1	5	15 36	?L	—	—	(15·6)	16·6
La Paz		40·9	244	8 4	+ 2	i 14 32	+12	20·2	25·0
San Fernando		43·5	28	8 6	−16	14 38	−17	20·0	26·0
Lisbon		44·1	25	e 8 3	−24	—	—	—	—
Rio Tinto		44·4	27	17 0	?	—	—	—	33·0
Malaga		44·5	29	8 59	+29	15 27	+18	—	—
Granada		45·3	30	i 8 30	− 5	15 9	−10	e 19·8	27·6
Almeria		45·7	31	8 27	−11	i 15 3	−21	e 22·4	25·3
Toledo		47·3	27	e 8 37	−12	e 15 23	−22	e 21·2	24·4
Algiers		48·6	35	8 47	−11	15 51	−10	23·5	34·3
Tortosa	E.	50·2	30	—	—	e 15 47	−34	e 22·0	35·6
	N.	50·2	30	9 1	− 6	15 38	−43	22·4	31·8
Barcelona		51·4	30	e 9 12	− 4	16 33	− 3	e 23·5	30·5
Cape Town		55·5	132	18 5	?S	(18 5)	+37	—	—
Moncalieri		56·8	31	11 43	+112	19 31	+107	28·1	36·2
Paris		57·2	25	e 9 52	− 1	e 17 48	− 1	25·0	30·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Rocca di Papa	E.	57·5	37	9 54	− 2	e 17 47	− 6	e 28·6	—
	N.	57·5	37	9 56	0	e 17 51	− 2	—	32·2
Besançon		57·5	29	e 9 57	+ 1	—	—	e 26·0	30·0
Florence		57·9	33	10 10	+12	19 0	+62	—	30·0
Pompeii		58·0	39	e 10 30	+31	—	—	30·0	—
Oxford		58·1	20	—	—	18 3	+ 3	24·2	29·0
Zurich		58·9	30	e 10 8	+ 4	e 18 10	0	—	—
Bidston		58·9	19	—	—	(18 0)	−10	18·0	29·0
Georgetown		59·1	319	—	—	(18 19)	+ 7	18·3	—
Strasbourg		59·3	28	10 8	+ 1	18 14	− 1	26·0	40·9
Uccle		59·5	25	e 10 10	+ 1	i 18 14	− 3	e 24·5	30·1
Stonyhurst		59·5	19	—	—	19 15	+58	24·5	29·2
Venice		59·5	34	10 28	+19	—	—	—	13·5
Innsbruck		60·2	31	10 12	− 1	—	—	e 27·0	—
Eskdalemuir		60·5	17	e 10 21	+ 5	18 30	0	i 25·1	—
De Bilt		60·8	25	e 10 18	0	e 18 29	− 4	e 25·0	30·6
Edinburgh		61·0	17	—	—	i 18 36	0	25·3	30·3
Ottawa		61·9	325	—	—	e 18 45	− 2	32·0	—
Dyce		62·5	16	e 10 28	− 1	e 19 55	+60	25·5	30·3
Toronto	E.	63·1	322	10 49	+16	e 19 2	0	31·5	—
Vienna		63·5	32	e 10 29	− 6	19 12	+ 5	e 30·0	37·0
Hamburg		63·9	26	e 10 36	− 1	—	—	26·0	32·0
Helwan		65·8	58	e 11 0	+10	20 5	+30	—	40·2
Bergen		67·3	18	—	—	—	—	e 36·0	—
Chicago	N.	67·6	318	—	—	19 49	− 8	29·6	—
Konigsberg		69·4	29	—	—	—	—	e 23·7	36·0
Ksara	E.	70·6	54	11 36	+15	20 55	+22	38·5	—
Upsala		71·2	23	—	—	e 20 35	− 5	e 31·0	40·2
Pulkovo		76·4	27	12 0	+ 3	21 36	− 6	35·0	40·4
Kucino		78·6	32	e 11 54	−17	21 41	−26	36·6	42·5
Ekaterinburg		91·2	33	13 16	− 6	23 55	[+20]	36·0	49·8
Victoria	E.	93·4	319	—	—	—	—	43·7	46·7
	N.	93·4	319	—	—	—	—	40·2	42·0
Bombay		102·2	70	e 23 19	?[S]	(e 23 19)	[−76]	—	—
Kodaikanal		107·6	80	55 36	?L	—	—	(55·6)	—
Hyderabad		107·6	72	e 25 13	?[S]	(e 25 13)	[+14]	—	65·6
Colombo		109·5	84	—	—	—	—	—	69·8
Irkutsk		116·2	28	—	—	e 29 47	+87	49·0	68·8
Manila		148·0	63	e 20 26	[+33]	—	—	77·0	—

Additional readings: San Fernando $PR_1 = +10$m.1s., MN = +27·0m. Granada i = +10m.26s. and +10m.39s. Toledo iNE = +15m.32s., iNW = +15m.33s., MNW = +29·6m. Barcelona MN = +28·9m. Strasbourg MN = +41·6m. Uccle MN = +36·1m. Innsbruck ePNE = +10m.15s. Eskdalemuir $SR_1 = +22$m.0s. De Bilt MN = +31·5m. Ottawa eL = +25·2m. Dyce S? = +17m.35s. Toronto SN = +18m.51s., LN = +41·4m. Hamburg MN = +30·0m., MZ = +34·0m. Konigsberg MN = +31·0m. Upsala MN = +38·5m. Pulkovo $SR_1 = +26$m.36s., MZ = +40·3m., MN = +41·1m. Kucino $SR_1 = +27$m.0s., MN = +40·3m. Ekaterinburg PS = +25m.10s., MN = +44·8m., MZ = +52·5m. Bombay S = +33m.12s. Irkutsk $PR_1 = +19$m.53s., e = +36m.1s., MZ = +68·0m.

Oct. 12d. Readings also at 3h. (near Athens), 13h. (La Paz), 14h. (near Manila), 16h. (near Mostar), 17h. (Ekaterinburg), 21h. (Ann Arbor and near Tacubaya).

Oct. 13d. 8h. 7m. 42s. Epicentre 38°·0N. 23°·7E. (Athens) (as on 1923 Sept. 19d.).

A = +·721, B = +·317, C = +·616; D = +·402, E = −·916; G = +·564, H = +·247, K = −·788.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		0·0	—	i 0 9	+ 9	—	—	i 0·2	0·4
Pompeii		7·6	294	e 4 33	?L	—	—	(e 4·6)	—
Rocca di Papa	E.	9·2	298	—	—	(4 4)	− 4	—	5·4
	N.	9·2	298	e 2 50	+31	(4 6)	− 2	—	5·4
	Z.	9·2	298	e 3 57	+98	(4 1)	− 7	—	13·6
Venice		11·2	315	e 1 46?	−61	e 4 53	− 6	—	9·2
De Bilt		19·1	323	—	—	—	—	e 12·3	—

Rocca di Papa S is given as PR_1

Oct. 13d. 12h. 25m. 25s. Epicentre 24°·0S. 24°·0W.

A = +·835, B = −·372, C = −·407 ; D = −·407, E = −·914 ;
G = −·372, H = +·165, K = −·914.

Very uncertain.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Rio de Janeiro		17·6	270	—	—	—	—	10·1	13·1
Cape Town		38·2	116	9 49	?PR_1	—	—	—	—
La Paz		41·9	273	e 8 7	− 3	—	—	20·4	23·3
Algiers		66·0	25	—	—	—	—	24·6	35·6
Rocca di Papa		74·0	28	e 11 23	−19	—	—	e 27·4	41·0
Moncalieri		74·8	23	e 8 26	?	—	—	36·2	—
Paris		76·6	18	—	—	—	—	e 41·6	—
Strasbourg		78·0	21	14 35?	?PR_1	—	—	e 35·6	41·6
Uccle		78·9	19	—	—	e 22 35	+24	e 34·6	—
Georgetown		80·1	320	—	—	e 19 37	?	e 27·6	—
De Bilt		80·3	17	e 12 20	− 1	e 22 52	+25	35·6	43·1
Edinburgh		81·9	11	—	—	—	—	e 37·6	—
Ithaca		82·2	324	—	—	—	—	47·6	—
Ottawa		83·8	326	e 24 20	?S	(e 24 20)	+73	e 38·1	—
Toronto	E.	84·6	323	—	—	—	—	45·2	—
Ann Arbor		86·2	320	—	—	—	—	e 36·3	—
Chicago		88·2	318	—	—	31 29	?SR_1	47·2	—
Pulkovo		94·7	24	—	—	e 24 41	−22	45·6	58·9
Ekaterinburg		107·1	35	e 20 47	?PR_1	—	—	48·6	—
Irkutsk		131·9	40	e 19 32	[+ 9]	e 39 8	?SR_1	68·6	—
Zi-ka-wei		148·7	69	e 18 40	[−74]	—	—	—	—

Additional readings and notes: The T_o adopted is that given by La Paz.
Rocca di Papa ePN = +11m.59s., ePE = +13m.5s. De Bilt eN = +28m.45s.
Ottawa ePR$_1$? = +25m.35s., eS = +30m.47s. Toronto LN = +51·1m.
Ann Arbor reading has been increased by 1h. Pulkovo MN = +58·6m.

1924. Oct. 13d. 16h. 17m. 36s. Epicentre 37°·0N. 72°·0E.

(as on 1915 June 3d.).

A = +·247, B = +·760, C = +·602 ; D = +·951, E = −·309 ;
G = +·186, H = +·572, K = −·799.

A depth of focus 0·030 is assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Simla	E.	−0·2	7·2	142	1 54	+ 8	2 42	−28	—	3·8
	N.	−0·2	7·2	142	2 0	+14	2 48	−22	—	3·4
Dehra Dun		−0·3	8·3	141	1 29	−32	—	—	2·2	3·1
Bombay		−1·1	18·1	177	4 4	− 1	—	—	—	—
Calcutta	E.	−1·2	20·2	131	4 40	+11	8 21	+19	8·4	—
	N.	−1·2	20·2	131	4 30	+ 1	8 11	+ 9	8·2	—
Hyderabad		−1·2	20·4	162	i 4 28	− 3	—	—	—	11·3
Ekaterinburg		−1·3	21·2	343	i 4 44	+ 4	i 8 24	+ 3	—	—
Irkutsk		−1·8	27·2	46	i 5 47	+ 5	10 21	+10	11·4	—
Kodaikanal		−1·8	27·2	168	10 36	?S	(10 36)	+25	14·5	16·2
Ksara		−2·0	29·4	275	i 5 53	− 9	(11 7)	+19	11·1	12·7
Kucino		−2·0	29·6	320	i 8 10	+126	i 11 47	+55	—	13·4
Colombo		−2·0	30·9	165	6 54	+37	(10 24)	−51	10·4	17·7
Pulkovo		−2·3	34·9	324	i 6 43	−10	i 11 59	−19	13·9	15·9
Lemberg		−2·4	36·4	306	e 6 42	−23	—	—	—	15·2
Athens		−2·4	37·9	284	e 7 12	− 6	e 12 44	−19	15·4	—
Konigsberg		−2·5	38·9	315	i 7 19	− 6	13 3	−13	e 15·6	16·1
Hong Kong		−2·5	39·1	103	8 8	+41	13 14	− 4	16·4	16·7
Belgrade		−2·5	39·1	299	i 7 37	+10	i 8 38	?PR_1	i 9·5	10·2
Zi-ka-wei		−2·5	40·9	85	7 45	+ 4	e 13 44	0	18·4	38·9
Upsala		−2·6	41·1	323	e 7 32	−10	e 13 32	−13	e 17·4	22·0
Mostar		−2·6	41·1	298	i 8 0	+18	—	—	—	—

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.
Vienna		−2·6	41·5	307	e 7 36	− 9	9 20	?PR$_1$	—	11·1
Taihoku		−2·7	43·6	92	e 8 6	+ 4	(e 14 9)	−11	e 14·2	—
Venice		−2·8	44·6	300	8 7	− 2	—	—	—	14·4
Innsbruck		−2·8	44·9	306	i 8 4	− 8	e 12 27	−129	—	—
Hamburg		−2·8	45·0	314	i 8 8	− 4	—	—	—	18·4
Rocca di Papa		−2·8	45·2	295	i 8 4	−10	—	—	e 19·2	23·8
Florence		−2·8	45·7	299	8 11	− 6	17 20	?SR$_1$	—	19·4
Zurich		−2·9	46·8	302	8 18	− 7	—	—	—	—
Strasbourg		−2·9	47·1	306	i 8 23	− 4	e 15 24	+19	e 21·9	24·0
Bergen		−2·9	47·2	324	—	—	0 24	?	9·4	14·4
Moncalieri		−3·0	47·9	300	8 33	+ 1	15 14	0	—	20·2
De Bilt		−3·0	48·1	311	i 8 30	− 4	i 15 18	+ 2	e 18·9	19·7
Besançon		−3·0	48·6	306	i 8 42	+ 5	15 49	+27	20·4	23·4
Uccle		−3·0	48·8	310	i 8 35	− 4	i 15 25	0	e 19·0	19·8
Manila		−3·0	48·8	105	e 8 51	+12	—	—	10·7	11·3
Paris		−3·1	50·4	308	i 8 47	− 2	15 47	+ 2	19·4	20·4
Osaka		−3·1	50·5	75	9 23	+33	(16 14)	+28	16·2	17·8
Dyce		−3·2	51·4	320	8 52	− 3	16 2	+ 6	20·9	26·8
Kew		−3·2	51·5	312	—	—	—	—	—	23·4
Oxford		−3·2	52·1	312	i 8 59	0	e 16 24	+19	—	20·4
Edinburgh		−3·2	52·2	318	i 9 0	0	i 16 38	+32	—	22·4
Stonyhurst		−3·2	52·3	314	i 8 59	− 2	16 6	− 1	20·4	22·1
Eskdalemuir		−3·2	52·4	318	i 9 2	+ 1	i 16 12	+ 3	—	—
Bidston		−3·3	52·7	314	9 9	+ 6	14 24	−107	17·3	21·8
Barcelona		−3·3	52·8	299	8 58	− 6	16 4	− 9	e 20·7	24·5
Mizusawa	E.	−3·3	53·1	66	9 18	+12	10 2	?	—	—
Algiers		−3·3	53·8	222	9 8	− 2	17 40	+75	22·4	25·4
Batavia		−3·4	54·1	138	e 9 45	+34	—	—	—	—
Tortosa	E.	−3·4	54·2	299	i 9 13	+ 1	13 19	?	e 17·7	—
	N.	−3·4	54·2	299	i 9 15	+ 3	16 36	+ 7	16·6	22·7
Toledo		−3·5	57·8	299	i 9 38	+ 3	e 17 24	+11	—	25·6
Almeria		−3·5	57·8	295	i 9 37	+ 2	15 43	−90	e 22·0	—
Granada		−3·5	58·5	295	i 9 44	+ 5	e 17 38	+17	e 23·6	35·8
San Fernando		−3·6	60·8	298	e 10 2	+ 9	18 32	+43	26·4	29·4
Lisbon		−3·6	61·8	300	e 10 6	+ 6	(e 19 6)	+65	e 19·1	—
Cape Town		−4·1	86·7	223	22 45	?[S]	(22 45)	[−22]	—	—
Ottawa		−4·3	92·6	339	e 13 2	− 5	(e 22 54)	[−50]	42·4	—
Victoria	N.	−4·3	93·5	10	23 31	?S	(23 31)	[−18]	24·8	25·5
Toronto		−4·3	95·3	341	—	—	(e 23 32)	[−27]	i 26·5	—
Chicago		−4·4	99·1	346	16 1	+139	23 56	[−23]	27·4	—
La Paz		—	139·3	290	19 4	[−34]	—	—	—	—
La Plata	E.	—	139·8	257	20 8	[+29]	22 14	?PR$_1$	22·9	23·8

Additional readings: Hyderabad PR$_1$ = +4m.34s. Irkutsk PR$_1$ = +6m.29s. Ksara iE = +6m.38s. and +7m.23s. Kucino i = +8m.49s. Pulkovo MZ = +15·4m. Athens iE = +8m.47s., eN = +10m.58s. Konigsberg PR$_1$ = +8m.23s., PR$_1$? = +8m.51s., iEN = +9m.47s., iE = +14m.22s., MN = +17·4m. Belgrade i = +9m.2s., MN = +10·7m. Zi-ka-wei iPZ = +7m.50s., PR$_1$ = +8m.31s., PS = +13m.54s., SR$_1$ = +15m.24s. Upsala PR$_1$E = +8m.37s., iPR$_1$E = +10m.10s., iSR$_1$E = +16m.53s., MN = +16·8m. Mostar i = +8m.30s., +9m.2s., +9m.46s., +10m.12s., +10m.41s. and +11m.13s. Vienna iP = +7m.38s., PR$_1$ = +8m.19s., PR$_2$ = +8m.53s., SR$_1$ = +10m.18s. Innsbruck iPR$_1$ = +10m.32s. Hamburg iPR$_1$ = +11m.0s., iSR$_1$ = +18m.0s., MN = +23·4m. Rocca di Papa iP = +8m.7s., PR$_1$N = +9m.14s., L = +31·2m. Zurich i = +9m.22s. Strasbourg i = +9m.27s., iPR$_1$ = +10m.20s., iPR$_2$ = +10m.51s., iPR$_3$ = +11m.29s., iSR$_1$ = +18m.51s., SR$_2$ = +19m.48s., eSR$_3$ = +20m.32s., MN = +24·6m. De Bilt i = +9m.34s. and +11m.23s., eE = +16m.15s. Uccle i = +9m.39s., PR$_1$ = +10m.32s., PR$_2$ = +11m.12s., i = +16m.36s. Manila MN = +11·5m. Paris i = +9m.51s., PR$_1$ = +10m.45s., e = +11m.44s. Osaka MN = +18·4m. Dyce i = +10m.38s. Edinburgh i = +10m.4s. and +12m.2s. Barcelona PR$_1$ = +10m.2s. Mizusawa SN = +10m.3s. Algiers PR$_1$? = +13m.23s. Batavia i = +10m.35s., +16m.34s., and 17m.55s. Toledo iP = +9m.43s., PR$_1$Z = +10m.43s., PR$_1$ = +10m.45s., SR$_1$ = +18m.38s., MNW = +25·5m. Granada i = +9m.48s., +10m.50s., +13m.5s. and +14m.49s. San Fernando MN = +31·9m. Ottawa eSN? = +17m.46s. Victoria LE = +23·8m., ME = +25·4m. La Paz iP = +19m.19s.

NOTE TO OCT. 12d. 16h. 17m. 36s.

Applying the correction for focus 0·030, and arranging in azimuths we obtain as mean corrections and equations giving the differences in longitude and latitude x and y, for the true epicentre over that adopted :

Az.	No. of Stns.	Equation.	Diff.	C.	O−C.
°			°	°	°
46	1	+ ·72x + ·69y =	+0·5	+0·1	+0·4
85	3	+1·00x + ·09y =	+0·2	+0·3	−0·1
150	6	+ ·50x − ·87y =	+0·6	+0·2	+0·4
305	36	− ·82x + ·57y =	+0·0	−0·3	+0·3

The solution of the equations is $x = +0°·3$, $y = -0°·1$

The last column shows that the depth of focus may be slightly too large.

Oct. 13d. Readings also at 0h. (Irkutsk), 1h. (Bombay), 2h. (Ekaterinburg), 10h. (Nagoya and near Mizusawa), 12h. (near Athens), 13h. (Victoria), 22h. (Nagasaki), 23h. (near La Plata).

1924. Oct. 14d. 5h. 0m. 6s. Epicentre 24°·0N. 46°·0W.

(as on 1922 Sept. 8d.).

A = +·635, B = −·657, C = +·407 ; D = −·719, E = −·695 ;
G = +·283, H = −·292, K = −·914.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Porto Rico	E.	19·0	256	4 40	+11	8 0	− 2	8·6	9·8
	N.	19·0	256	—	—	e 8 24	+22	9·0	10·1
Harvard	E.	27·7	318	6 46	+41	—	—	13·4	—
	N.	27·7	318	6 24	+19	11 6	+12	12·1	13·4
Cheltenham	N.	30·0	307	e 6 29	+ 1	—	—	13·1	19·3
Georgetown		30·2	307	6 33	+ 3	11 52	+15	15·0	—
Ithaca		31·2	316	—	—	—	—	13·9	—
Ottawa		32·2	320	e 6 47	− 3	e 11 46	−25	e 14·1	16·9
Toronto	E.	33·6	316	e 7 0	− 1	i 12 38	+ 4	14·6	18·2
	N.	33·6	316	—	—	12 39	+ 5	14·9	16·0
Ann Arbor		36·1	311	6 0	−83	(14 0)	+49	14·0	19·3
San Fernando		36·2	61	e 7 12	−12	13 1	−12	16·9	23·9
Granada		38·4	60	i 7 32	− 9	13 24	−20	18·3	20·3
Toledo		38·5	57	7 34	− 8	i 13 30	−15	e 17·7	24·0
Chicago		38·7	309	e 9 13	+89	13 51	+ 3	17·4	—
Almeria		39·4	61	7 44	− 6	13 44	−13	19·8	—
Tortosa	E.	42·1	54	i 8 7	− 5	i 14 29	− 7	20·1	22·4
	N.	42·1	54	8 7	− 5	14 34	− 2	e 19·9	21·7
Barcelona		43·4	54	e 8 18	− 3	e 14 45	− 9	e 18·2	23·1
Bidston		43·5	37	8 21	− 1	14 49	− 6	17·4	22·1
Algiers		43·7	60	e 8 6	−18	14 48	−10	21·4	24·4
Oxford		43·8	40	8 16	− 8	14 52	− 7	19·9	22·1
Stonyhurst		44·0	37	8 22	− 4	14 59	− 3	19·9	22·5
Kew		44·3	40	—	—	—	—	—	23·9
Edinburgh		44·5	34	e 8 32	+ 2	15 6	− 3	19·9	25·7
Paris		45·2	45	i 8 31	− 3	e 15 12	− 6	19·9	22·9
Dyce		45·6	31	8 38	+ 1	15 21	− 1	20·1	23·9
La Paz	E.	45·9	211	i 8 43	+ 4	15 32	+ 5	22·2	25·3
Uccle		46·9	42	i 8 44	− 2	15 37	− 3	e 20·9	22·9
Rio de Janeiro		47·0	176	i 15 46	?S	(i 15 46)	+ 5	19·0	22·4
Besançon		47·1	47	i 8 47	− 1	15 41	− 1	18·9	22·9
De Bilt		47·7	41	i 8·52	0	15 48	− 2	e 21·9	23·7
Moncalieri		47·9	50	8 56	+ 3	15 56	+ 3	22·6	33·8
Strasbourg		48·5	46	i 8 59	+ 2	16 2	+ 2	21·9	29·8
Zurich		48·9	48	e 9 0	+ 1	e 16 3	− 2	—	—
Florence		50·3	52	9 11	+ 2	16 24	+ 1	—	22·9
Hamburg		50·9	39	i 9 16	+ 4	i 16 36	+ 6	e 23·9	26·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Venice		51·2	51	i 8 54?	−20	—	—	—	—
Rocca di Papa		51·3	56	9 17	+ 2	16 33	− 2	e 25·5	26·4
Pompeii		52·7	57	e 9 54	+30	e 16 54	+ 2	—	—
Vienna		54·2	46	9 36	+ 2	17 16	+ 5	e 25·9	33·9
Upsala		56·2	33	e 9 54	+ 7	e 17 45	+ 9	e 27·0	33·5
Konigsberg		57·2	39	e 10 22	+29	i 18 2	+13	e 24·6	29·2
La Plata	E.	60·0	192	—	—	—	—	27·4	29·4
Pulkovo		62·6	35	10 39	+10	i 19 7	+11	27·9	33·5
Victoria		64·1	315	19 42	?S	(19 42)	+28	31·5	36·6
Berkeley		65·1	302	e 11 3	+17	—	—	e 35·7	—
Kucino		67·0	39	11 8	+10	20 9	+19	32·7	38·2
Ksara	E.	70·5	62	11 32	+12	(21 10)	−38	21·2	—
Ekaterinburg		78·6	34	i 12 18	+ 7	i 22 19	+12	32·9	43·5
Honolulu	E.	99·9	298	—	—	—	—	e 45·1	—
Bombay		106·5	60	18 54?	?PR_1	—	—	—	—
Hyderabad		111·7	58	e 28 54	?S	(e 28 54)	+71	—	70·4
Kodaikanal		114·9	66	65 18	?L	—	—	(65·3)	—
Colombo		118·8	67	—	—	—	—	—	76·2
Zi-ka-wei		123·5	12	e 19 2	[0]	—	—	—	78·0
Manila		139·3	19	e 21 54	?PR_1	—	—	—	78·9

Additional readings: Cheltenham LN = +19·2m. Georgetown eLN = +14·0m. Ottawa ePR_2 = +7m.40s., MN = +15·9m. Toronto PR_1E = +8m.8s., PR_1N = +8m.9s., iSN = +12m.46s. Ann Arbor S = +10m.54s., MN = +17·8m. San Fernando MN = +19·9m. Granada i = +9m.5s. and +14m.6s. Toledo PR_1 = +9m.0s. Barcelona PR_1? = +9m.52s., MN = +22·1m. La Paz PR_1N = +10m.27s., PR_1E = +10m.39s., iSN = +15m.26s. (O−C. = −1s.), iPS = +15m.47s., T_0 = 5h.0m.12s. De Bilt MN = +23·9m., MZ = +25·8m. Strasbourg PR_1 = +10m.48s., MN = +24·2m. Florence S = +15m.34s. Rocca di Papa P = +9m.18s. and +9m.19s. Vienna PS = +17m.36s. Upsala MN = +32·8m. Pulkovo MN = +32·7m., MZ = +33·7m. Victoria LN = +29·5m., MN = +32·0m. Kucino e = +12m.32s., SR_1 = +24m.24s. Ekaterinburg i = +14m.7s. and +15m.14s., MN = +36·6m., MZ = +45·0m.

Oct. 14d. Readings also at 0h. (Nagoya and near Mizusawa), 2h. (Nagasaki), 3h. (Zi-ka-wei, Batavia, and Malabar), 4h. (Apia), 5h. (near Athens), 10h. (Florence), 11h. (near Mizusawa), 13h. (near Nagasaki), 16h. (near Taihoku), 18h. (Apia), 20h. (Irkutsk).

Oct. 15d. 4h. 15m. 42s. Epicentre 37°·0N. 10°·0W. (as on 1922 Oct. 20d.).

A = +·787, B = −·139, C = +·602; D = −·174, E = −·985; G = +·593, H = −·105, K = −·799.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Lisbon	1·8	43	0 34	+ 6	1 4	+13	—	—
Granada	5·1	86	e 1 49	+30	i 2 14	− 6	2·3	2·4
Toledo	5·5	57	e 1 21	− 4	i 2 29	− 2	i 2·7	3·3
Tortosa	9·0	62	3 58	?S	(3 58)	− 5	5·2	5·4
De Bilt	18·5	30	—	—	—	—	e 11·8	—
Ekaterinburg	49·6	43	—	—	—	—	30·3	—

Granada gives also L = +2·7m., MN = +2·9m. Tortosa SN = +5m.4s.

Oct. 15d. Readings also at 0h. (near Kobe), 9h. (La Paz), 10h. (Apia), 13h. (Apia and La Paz), 16h. (Ekaterinburg), 18h. (near Tacubaya), 19h. (Mizusawa), 23h. (La Paz).

Oct. 16d. Readings at 2h. (near La Paz), 4h. (Fordham and Nagasaki), 7h. (Nagoya and near Mizusawa), 8h. (Nagasaki), 10h. (Hong Kong, Ekaterinburg, near Manila, and near Tacubaya), 14h. (Ekaterinburg), 21h. (La Paz), 23h. (Ekaterinburg, La Paz, and near La Plata).

Oct. 17d. 4h. 23m. 10s. Epicentre 60°·0N. 118°·0W.

A = −·235, B = −·441, C = +·866 ; D = −·883, E = +·469 ;
G = −·407, H = −·765, K = −·500.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	E.	9·5	260	2 10	−13	4 21	+ 5	4·7	5·1
Victoria	E.	12·0	197	5 16	?S	(5 16)	− 3	6·9	8·6
	N.	12·0	197	5 20	?S	(5 20)	+ 1	6·9	9·6
Berkeley		22·3	189	—	—	i 8 50	−21	i 16·8	—
Chicago		26·1	121	·6 34	+45	10 33	+ 9	13·4	18·4
Ann Arbor		27·4	115	—	—	—	—	e 13·8	18·1
St. Louis		27·6	128	—	—	—	—	e 14·6	—
Tucson	E.	28·1	167	—	—	e 16 40	?L	18·4	18·9
Toronto	E.	28·3	108	6 5	− 6	10 55	− 9	13·8	19·2
Ottawa		28·8	101	e 6 17	+ 1	e 11 4	− 9	e 14·1	19·3
Ithaca		30·6	106	—	—	—	—	e 18·8	20·3
Cheltenham		33·3	110	—	—	—	—	e 20·8	21·7
Harvard	E.	33·3	101	—	—	e 19 27	?L	e 21·6	21·7
Honolulu	E.	47·8	234	—	—	e 15 55	+ 4	—	—
Pulkovo		57·7	19	—	—	—	—	e 23·8	—
De Bilt	E.	59·0	37	—	—	—	—	e 23·8	—
Uccle		59·9	39	—	—	—	—	e 23·8	—
Strasbourg		62·9	38	—	—	—	—	e 34·8	—
Granada		69·0	52	—	—	—	—	i 23·2	30·4
Hong Kong		87·4	314	—	—	—	—	—	39·3
Manila		91·8	305	—	—	—	—	e 56·3	—

Additional readings and notes: Sitka, all readings have been increased by 3m. Ann Arbor MN = +18·8m. St. Louis iE = +18m.15s., +18m.39s., and +19m.6s., iLE = +19·8m. Toronto LN = +14·0m., iN = +19m.1s., iE = +19m.2s. Cheltenham LN = +21·4m., LE = +21·6m. Harvard eN = +21m.12s. De Bilt eLN = +27·8m.

Oct. 17d. Readings also at 0h. and 1h. (Ekaterinburg), 2h. (Nagasaki), 3h. (Fordham), 8h. (near Tacubaya), 12h. (near Zurich), 14h. (Nagasaki), 16h. (Manila and Ekaterinburg), 18h. (near Athens), 22h. (Nagasaki), 23h. (Athens).

Oct. 18d. 19h. 35m. 52s. Epicentre 29°·0N. 130°·0E. (as on 1923 Nov. 6d.).

A = −·562, B = +·670, C = +·485 ; D = +·766, E = +·643 ;
G = −·312, H = +·371, K = −·875.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki	3·7	358	1 40	?S	(1 40)	− 2	3·2	3·4
Osaka	7·3	38	3 3	?S	(3 3)	−15	5·1	6·8
Zi-ka-wei	7·7	289	e 1 56	− 1	e 3 22	− 7	—	4·6
Taihoku	8·5	244	e 2 20	+11	3 40	−10	4·7	—
Hong Kong	15·7	249	3 50	+ 2	6 51	+ 3	8·4	9·6
Manila	16·7	212	e 4 6	+ 5	(7 20)	+ 9	7·3	—
Irkutsk	30·0	330	e 6 33	+ 5	11 24	−10	16·1	—
Bombay	52·7	273	—	—	—	—	27·1	—
Ekaterinburg	54·9	322	—	—	e 15 32	−108	26·1	36·2
Kucino	67·5	323	—	—	—	—	34·4	37·7
Pulkovo	69·9	330	—	—	—	—	e 36·1	40·3
Apia	70·7	119	—	—	—	—	76·1	—
Upsala	75·4	332	—	—	—	—	e 43·1	49·1
Konigsberg	76·7	327	—	—	—	—	e 42·4	44·1
Hamburg	82·5	329	—	—	—	—	e 44·1	48·1
De Bilt	85·6	329	—	—	—	—	e 44·6	49·0
Edinburgh	86·2	336	—	—	—	—	e 36·1	—
Eskdalemuir	86·7	336	—	—	—	—	45·1	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Uccle	86·9	329	—	—	e 24 8?	+28	e 45·1	—
Strasbourg	86·9	325	—	—	—	—	e 46·1	49·1
Stonyhurst	87·5	333	—	—	—	—	e 49·1	63·1
Kew	88·4	332	—	—	—	—	—	52·1
Besançon	88·7	325	—	—	—	—	49·1	—
Paris	89·2	329	e 29 36	?SR_1	—	—	50·1	51·1
Moncalieri	89·3	324	—	—	e 43 40	?L	49·5	—
Toledo	99·0	326	—	—	—	—	e 43·4	63·9

Additional readings and notes: Osaka MN = +5·6m. Zi-ka-wei MN = +4·4m., readings all given for 18h. Ekaterinburg MN = +31·3m. Pulkovo MN = +40·4m., MZ = +43·7m. De Bilt MN = +50·1m., MZ = +57·4m. Toledo MNW = +56·3m.

Oct. 18d. 22h. 47m. 30s. Epicentre 37°·2N. 3°·6W. (Granada).

A = +·795, B = −·050, C = +·605; D = −·063, E = −·998; G = +·603, H = −·038, K = −·797.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Granada	0·0	—	i 0 0	0	—	—	0·0	0·1
Malaga	0·8	234	0 9	− 3	—	—	0·2	0·4
Almeria	1·2	111	i 0 25	+ 7	i 0 37	+ 4	0·7	0·8
San Fernando	2·2	251	0 47	+13	1 7	+ 7	(1·1)	2·0
Toledo	2·7	353	e 0 45	+ 3	1 23	+ 9	i 1·5	1·8
Tortosa	4·8	40	1 17	+ 3	2 38	+27	2·8	2·8
Paris	12·4	19	e 6 1	+176	e 8 5	+156	9·5	—
Strasbourg	14·0	32	—	—	—	—	e 8·5	—
De Bilt	16·1	20	—	—	—	—	e 10·8	—
Vienna	18·3	47	e 4 33	+12	—	—	—	—
Ekaterinburg	46·0	43	e 4 36	?	e 15 43	+15	21·5	—

Additional readings: San Fernando MN = +1·5m. Toledo P = +55s., MZ = +1·6m. Tortosa MN = +3·0m.

Oct. 18d. 23h. 5m. 15s. Epicentre 3°·0N. 80°·5W.

A = +·165, B = −·985, C = +·052; D = −·986, E = −·165; G = +·009, H = −·052, K = −·999.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		6·1	9	1 45	+12	—	—	—	—
Porto Rico		21·2	43	4 56	+ 1	8 47	− 1	—	9·0
La Paz		23·0	148	i 5 14	− 3	i 9 26	+ 1	12·0	16·8
Tacubaya		24·6	313	5 56	+22	9 31	−23	10·7	—
Georgetown		36·1	6	e 7 10	−13	e 12 45	−26	e 17·0	—
Fordham		38·4	9	7 32	− 9	13 40	− 4	17·4	20·8
Chicago		39·3	353	7 52	+ 3	14 2	+ 6	19·6	—
Ann Arbor		39·4	357	6 51	−59	12 45	−72	17·2	25·8
Harvard		40·3	12	7 56	− 1	14 5	− 6	21·2	24·1
Toronto	E.	40·7	2	e 8 14	+13	i 14 10	− 7	22·6	27·2
	N.	40·7	2	i 8 0	− 1	13 8	−69	21·4	32·1
Tucson	E.	40·9	320	—	—	—	—	e 22·8	—
Ottawa		42·6	6	i 8 13	− 2	i 14 41	− 2	e 19·8	21·8
La Plata	E.	43·4	153	i 8 17	− 4	14 37	−17	23·9	25·6
	N.	43·4	153	i 8 24	+ 3	14 44	−10	24·3	28·6
Rio de Janeiro		44·7	129	e 8 15	−16	14 45	−26	22·1	24·2
Victoria	E.	58·3	329	18 32	?S	(18 32)	+29	31·2	37·6
	N.	58·3	329	18 30	?S	(18 30)	+27	31·5	38·5
San Fernando		75·6	54	e 12 12	+19	21 57	+24	35·8	44·8
Malaga		77·1	54	12 7	+ 5	21 57	+ 7	—	—
Honolulu	E.	77·4	291	—	—	—	—	e 32·9	—
Toledo		77·7	51	e 12 10	+ 5	e 21 53	− 4	e 34·8	—
Granada		77·7	54	i 12 10	+ 5	e 22 10	+13	—	—
Eskdalemuir		80·3	35	e 12 26	+ 5	22 26	− 1	39·8	—
Edinburgh		80·5	35	e 12 45?	+23	i 22 43	+14	42·8	55·8
Stonyhurst		80·6	38	12 27	+ 4	22 39	+ 9	40·8	55·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Oxford		81·0	40	i 12 27	+ 2	i 22 43	+ 8	—	—
Tortosa	N.	81·3	50	—	—	22 35	− 3	e 36·8	—
Algiers		83·1	54	e 12 39	+ 2	23 9	+11	e 40·8	48·8
Paris		83·2	42	e 11 39	−58	e 22 53	− 6	43·8	—
Uccle		84·4	40	12 48	+ 4	23 8	− 4	e 40·8	—
De Bilt		85·0	39	12 51	+ 3	23 15	− 4	e 42·8	47·0
Strasbourg		86·6	43	e 14 1	+64	e 24 47	+70	e 34·8	54·8
Moncalieri		86·6	46	13 26	+29	18 34	?PR_1	21·8	24·3
Hamburg		87·9	37	e 13 4	0	e 23 43	− 8	e 46·8	—
Innsbruck	NE.	89·1	43	e 13 15	+ 4	—	—	—	—
Rocca di Papa		90·4	49	i 13 18	0	e 23 57	−21	—	25·8
Vienna		92·4	41	e 13 24	− 5	—	—	—	24·8
Pulkovo		97·6	29	e 12 57	−61	24 28	−64	45·2	59·3
Cape Town		99·1	125	—	—	—	—	—	54·4
Ekaterinburg		112·5	22	e 19 28	?PR_1	i 27 23	−27	45·8	64·3
Riverview		122·9	229	—	—	—	—	e 63·0	66·3
Sydney		122·9	229	58 3	?	—	—	63·6	66·2
Adelaide		131·7	223	—	—	e 68 9?	?	e 73·2?	76·3
Bombay		145·8	50	—	—	—	—	—	93·8
Kodaikanal		154·3	59	91 9	?L	—	—	(91·2)	—
Colombo		158·0	63	—	—	—	—	—	96·8

Additional readings: Porto Rico MN = +8·9m. T_o = 23h.5m.22s. La Paz iPR_1 = +5m.44s., PR_2 = +6m.11s., SR_1 = +10m.24s., SR_2 = +10m.50s. T_o = 23h.5m.6s. Fordham PR_1? = +9m.15s. Ann Arbor PR_2 = +8m.15s., MN = +25·2m. Harvard SR_1E = +16m.58s., SR_1N = +17m.13s., LN = +19·8m., MN = +28·5m. T_o = 23h.5m.25s. Toronto SR_1E = +17m.15s. T_o = 23h.5m.30s. Ottawa SR_1E = +17m.49s. T_o = 23h.5m.17s. La Plata PR_2?E = +10m.26s. T_o = 23h.5m.31s. Granada i = +12m.14s. and +22m.28s. De Bilt MZ = +49·0m. Rocca di Papa ePE = +13m.19s., ePN = +13m.24s. Pulkovo MZ = +70·8m. Riverview MN = +65·9m.

Oct. 18d. Readings also at 1h. (Kobe and Ekaterinburg), 4h. (near Hokoto and near Manila), 5h. (near Athens), 6h. (Ekaterinburg, near Athens, Mizusawa, Sapporo, and Oaxaca), 7h. (Uccle), 16h. (Kobe, near Osaka, and Nagoya), 17h. (near Oaxaca and near Tacubaya), 18h. and 19h. (Kobe), 21h. and 22h. (Ekaterinburg), 23h. (Hyderabad).

Oct. 19d. 15h. 34m. 45s. Epicentre 79°·0N. 110°·0E.

A = −·065, B = +·179, C = +·982; D = +·940, E = +·342: G = −·336, H = +·922, K = −·191.

Uncertain.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Irkutsk		26·8	188	e 5 59	+ 3	e 10 44	+ 7	19·2	25·3
Ekaterinburg		27·2	245	i 6 2	+ 2	10 31	−14	13·2	—
Pulkovo		30·1	277	—	—	—	—	e 12·2	—
Kucino		32·4	269	—	—	—	—	e 15·2	—
Edinburgh		39·6	305	—	—	e 13 15?	−45	—	—
Eskdalemuir		40·1	305	—	—	(e 13 15)	−53	e 13·2	—
De Bilt		41·9	296	—	—	—	—	e 17·2	—
Uccle		43·2	297	—	—	—	—	e 18·2	—
Strasbourg		44·8	292	—	—	—	—	e 25·2	—
Venice		47·0	289	e 38 25	?L	—	—	(e 38·4)	38·7
Victoria	E.	48·8	45	13 12	?	—	—	15·1	16·3
	N.	48·8	45	13 22	?	—	—	16·3	19·3
Ottawa		55·6	4	e 9 30	−13	—	—	e 13·0	16·2
Toronto	E.	57·2	8	—	—	(16 38)	−71	16·6	17·1
	N.	57·2	8	e 13 30	?PR_1	(16 30)	−79	16·5	19·6
Granada		57·8	300	e 11 10	+72	e 17 57	+ 1	23·6	26·9
Ann Arbor		58·4	12	e 13 9	?PR_1	(i 17 27)	−37	i 17·4	20·6
Ithaca		58·5	5	—	—	e 16 15	−110	—	18·2
Chicago		58·8	16	12 9	+125	18 12	+ 3	—	20·9
Denver	E.	59·6	31	15 15?	?	—	—	17·2	17·2
Fordham		60·1	4	e 16 15	?	e 18 30	+ 6	20·9	21·3
Georgetown		62·0	6	e 14 58	?PR_1	19 24	+36	e 22·4	—

Additional readings: Ekaterinburg eP = +4m.22s. (O − C = −98s.), the reading entered as P is given as i simply. Ottawa MN = +19·2m. Toronto eE = +6m.0s. and +12m.0s. Ann Arbor iS? = +16m.27s., MN = +20·8m. Ithaca MN = +20·2m.

Oct. 19d. 23h. 52m. 10s. Epicentre 27°·0N. 42°·0W. (as on 1922 Sept. 22d.).

$A = +·662$, $B = -·596$, $C = +·454$; $D = -·669$, $E = -·743$; $G = +·337$, $H = -·304$, $K = -·891$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
San Fernando		31·7	64	e 6 40	− 4	e 12 4	+ 1	16·3	—
Ithaca		32·0	309	—	—	(12 50)	+42	14·8	—
Ottawa		32·4	315	(e 7 2)	+10	—	—	e 12·8	—
Malaga		33·1	64	6 45	−12	12 33	+ 7	—	—
Granada		33·8	64	7 0	− 3	12 52	+14	16·5	17·3
Toledo		33·9	60	e 7 7	+ 3	e 13 34	+55	e 15·4	17·3
Toronto	E.	34·3	310	—	—	e 14 54	+130	16·1	—
Almeria		34·8	64	e 6 57	−14	e 12 45	− 7	e 17·8	—
Tortosa		37·5	58	—	—	13 38	+ 7	e 15·8	18·3
Algiers		39·1	65	e 7 53	+ 6	14 0	+ 7	21·3	—
Oxford		39·2	40	—	—	—	—	17·1	—
Stonyhurst		39·5	39	9 15	+84	16 30	+151	—	—
Chicago	E.	39·9	304	—	—	13 28	−37	e 19·5	—
Edinburgh		40·1	34	—	—	i 13 56	−12	—	—
Paris		40·5	46	—	—	—	—	20·8	—
Uccle		42·3	44	e 8 1	−12	—	—	e 19·9	—
De Bilt		42·0	41	8 18	0	14 44	− 4	e 20·8	—
Moncalieri		43·2	53	8 46	+26	i 15 31	+39	20·8	—
Strasbourg		43·8	47	e 8 15	− 9	e 14 56	− 3	e 19·8	—
Innsbruck	N.W.	46·0	49	e 8 26	−14	—	—	—	—
Rocca di Papa		46·7	58	e 8 36	− 9	18 4	?SR_1	—	—
Vienna	Z.	49·5	48	i 9 2	− 2	—	—	—	—
La Paz		50·4	214	9 11	+ 2	—	—	—	—
Pulkovo		58·1	35	10 12	+12	18 20	+20	28·8	34·0
Victoria	E.	64·6	315	19 3	?S	(19 3)	−17	31·6	35·6
	N.	64·6	315	—	—	—	—	31·8	36·0
Ekaterinburg		74·1	35	i 11 43	0	e 21 18	+ 3	28·8	—

Additional readings: Granada i = +13m.10s. Toledo MNW = +16·2m. Toronto LN = +16·0m. De Bilt eLN = +17·8m. Rocca di Papa ePZ = +8m.38s. Pulkovo MZ = +33.8m. Ekaterinburg e = +19m.27s.

Oct. 19d. Readings also at 1h. (La Paz), 3h. (near Taihoku), 8h. (Perth, Riverview and La Paz), 15h. (near Venice and near St. Louis), 21h. (Nagoya and near Osaka and Kobe).

Oct. 20d. 5h. 21m. 25s. Epicentre 39°·7N. 124°·6W. (as on 1923 Jan. 22d.).

$A = -·437$, $B = -·633$, $C = +·639$; $D = -·823$, $E = +·568$; $G = -·363$, $H = -·526$, $K = -·769$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Berkeley		2·5	135	i 1 9	+30	1 55	+46	2·9	—
Victoria	E.	8·7	6	—	—	(3 51)	− 5	3·8	6·4
	N.	8·7	6	2 6	− 6	—	—	5·0	7·2
Chicago		27·9	74	—	—	11 16	+19	16·2	—
Toronto		33·6	67	—	—	—	—	e 22·8	—
Ottawa		35·9	64	—	—	—	—	e 20·4	—

Berkeley gives also ePE = +1m.10s., iPNZ = +1m.18s., LZ = +3·0m.

Oct. 20d. 8h. 38m. 20s. Epicentre 27°·6S. 66°·3W. (as on 1920 Aug. 3d.).

$A = +·356$, $B = -·811$, $C = -·463$; $D = -·916$, $E = -·402$; $G = -·186$, $H = +·424$, $K = -·886$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
La Plata	E.	10·2	137	2 30	− 3	4 35	0	5·7	7·5
	N.	10·2	137	2 39	+ 6	4 44	+ 9	—	6·8
La Paz		11·2	350	i 2 43	− 4	i 3 59	−60	7·1	7·6
Rio de Janeiro		21·4	83	e 4 55	− 3	(8 55)	+ 2	8·9	9·2
Tacubaya		56·7	322	9 17	−33	16 57	−45	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Toronto	E.	72·3	350	—	—	i 20 15	−39	21·2	—
Ottawa		73·4	354	e 11 14	−24	—	—	i 27·5	—
San Fernando		85·4	44	e 13 10	+20	23 42	+19	36·2	42·2
Granada		87·4	45	12 38	−23	24 16	+31	i 47·0	59·2
Victoria	E.	91·5	327	—	—	(23 49)	[+12]	23·8	25·4
	N.	91·5	327	—	—	(23 28)	[− 9]	23·5	24·2
Edinburgh		99·2	30	—	—	e 28 40?	+172	—	—
Rocca di Papa		100·5	48	e 18 15	?PR_1	—	—	—	—
Strasbourg		100·7	41	—	—	(e 25 40)	−22	e 25·7	—
De Bilt	Z.	101·1	37	e 13 36	−40	e 18 30	?PR_1	e 52·7	—
Pulkovo		116·8	33	e 19 52	?PR_1	—	—	54·7	—
Ekaterinburg		132·8	36	i 18 54	[−31]	—	—	51·7	—
Batavia		145·6	168	i 19 17	[−32]	—	—	—	—

Additional readings: La Plata N = +4m.51s. and +6m.40s., E = +5m.14s. T_o = 8h.38m.17s. Granada L = +54·7m. Rocca di Papa eZ = +17m.24s. Ekaterinburg i = +19m.25s. and +21m.56s., iPR_1 = +21m.26s., e = +39m.44s.

1924. Oct. 20d. 19h. 52m. 42s. Epicentre 55°·2N. 165°·0E.

A = −·551, B = +·148, C = +·821; D = +·259, E = +·966; G = −·793, H = +·213, K = −·571.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		16·3	248	4 1	+ 5	—	—	8·2	10·0
Mizusawa		22·6	235	5 11	− 1	9 17	0	12·6	—
Nagoya		27·8	236	5 50	−16	—	—	—	—
Osaka		28·9	237	6 6	−11	11 2	−13	14·2	16·8
Kobe	N.	29·0	238	—	—	—	—	—	12·1
Sitka	E.	32·2	64	6 32	−18	11 40	−31	16·2	19·7
	N.	32·2	64	—	—	—	—	e 17·2	18·8
Irkutsk		34·9	290	i 6 55	−17	i 12 21	−33	17·3	21·4
Zi-ka-wei		38·8	250	e 7 25	−19	e 13 18	−31	—	22·3
Victoria	E.	42·9	70	8 0	−17	14 28	−19	20·2	23·9
	N.	42·9	70	8 3	−14	14 30	−17	20·4	23·7
Honolulu	E.	43·6	128	—	—	15 0	+ 4	20·4	20·8
	N.	43·6	128	e 8 49	+26	i 14 47	− 9	21·3	20·6
Taihoku		43·7	244	14 48	?S	(14 48)	−10	21·0	25·5
Hong Kong		49·8	250	8 56	−10	16 10	− 6	24·9	29·8
Berkeley		50·3	80	i 9 3	− 6	16 14	− 9	24·2	25·6
Ekaterinburg		52·4	320	i 9 18	− 4	i 16 43	− 6	25·3	33·3
Manila		52·8	238	e 9 24	− 1	(16 38)	−16	16·6	—
Pulkovo		59·5	336	i 10 7	− 2	i 18 16	− 1	27·3	33·8
Kucino		61·0	330	i 10 12	− 7	i 18 12	−24	28·6	33·5
Upsala		62·1	344	e 10 30	+ 4	i 18 47	− 2	e 32·3	37·1
Bergen		63·3	350	—	—	—	—	e 39·3	—
Simla	E.	63·7	288	e 10 48	+12	19 18	+ 9	—	30·8
	N.	63·7	288	e 10 48	+12	19 24	+15	—	29·7
Calcutta	E.	64·1	274	10 36	− 3	19 2	−12	—	—
	N.	64·1	274	10 32	− 7	19 8	− 6	—	—
Chicago		65·2	53	11 0	+14	19 26	− 1	30·8	37·3
Konigsberg		66·1	340	10 56	+ 4	19 42	+ 4	e 33·8	35·3
Ann Arbor		66·4	50	11 3	+ 9	i 19 33	− 9	31·6	38·4
St. Louis	E.	66·5	57	i 11 16	+21	i 19 43	− 1	e 35·3	39·8
	N.	66·5	57	i 11 17	+22	i 19 43	− 1	e 35·3	40·3
Dyce		67·0	355	10 58	0	20 1	+11	41·3	58·0
Toronto	E.	67·1	46	10 46	−13	19 50	− 1	31·9	39·7
	N.	67·1	46	—	—	i 19 50	− 1	35·3	43·1
Ottawa		67·1	43	e 10 59	0	i 19 44	− 7	e 31·9	36·3
Edinburgh		68·5	355	e 10 18?	−50	20 10	+ 2	35·3	68·8
Eskdalemuir		69·0	355	11 11	0	i 20 15	+ 1	33·3	—
Hamburg		69·3	346	e 11 12	− 1	e 20 5	−13	e 35·3	40·3
Ithaca		69·3	45	—	—	i 20 14	− 4	e 34·3	—
Stonyhurst		70·4	354	—	—	i 20 32	+ 1	42·3	—
Bidston		70·9	354	11 18	− 4	20 18	−19	—	—
De Bilt		71·4	348	11 26	0	20 45	+ 2	e 38·3	59·2
Harvard		71·4	41	—	—	e 21 32	+49	36·6	45·4

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		71·8	156	—	—	22 18?	+90	35·3	—
Georgetown	E.	72·1	48	e 11 24	− 7	i 20 42	− 9	38·4	44·6
	N.	72·1	48	i 11 24	− 7	i 20 42	− 9	43·5	43·7
Cheltenham	N.	72·3	47	—	—	—	—	e 40·8	46·2
Oxford		72·4	354	11 38	+ 6	i 20 58	+ 3	—	46·7
Kew		72·6	353	—	—	—	—	—	64·3
Uccle		72·7	349	e 11 31	− 3	20 58	0	e 31·3	35·3
Vienna		73·3	340	e 11 36	− 2	21 8	+ 2	e 38·3	50·6
Hyderabad		73·8	278	11 33	− 8	21 0	−12	38·4	47·9
Strasbourg		74·5	346	i 11 40	− 6	i 21 19	− 1	32·3	55·4
Paris		75·0	350	e 11 48	− 1	i 21 23	− 3	41·3	47·3
Innsbruck	N.W.	75·1	343	e 11 50	0	—	—	—	—
Zurich		75·5	345	e 11 50	− 2	e 21 26	− 6	—	—
Bombay		75·7	283	11 47	− 6	21 2	−32	40·0	47·9
Besançon		76·1	346	—	—	21 32	− 6	—	42·3
Venice		76·7	340	e 11 58	− 1	i 22 8	+23	32·3?	—
Tacubaya	E.	77·3	76	12 3	0	21 47	− 5	—	—
	N.	77·3	76	11 55	− 8	21 39	−13	—	—
Batavia		77·8	240	i 12 4	− 2	i 22 4	+ 6	e 49·6	—
Moncalieri		78·0	345	12 45	+38	22 33	+33	32·6	49·6
Florence		78·6	342	11 48	−23	22 8	+ 1	32·3	44·3
Rocca di Papa		80·2	339	12 21	+ 1	i 22 21	− 4	e 44·9	55·7
Kodaikanal		80·2	275	33 30	?	—	—	46·0	53·7
Pompeii		80·7	339	e 13 54	+91	e 23 48	+77	—	—
Athens		81·2	330	e 12 20	− 6	22 36	− 1	40·3	—
Colombo		81·5	271	11 48	−40	—	—	50·8	52·8
Barcelona		82·2	348	e 12 29	− 2	22 42	− 6	e 44·9	52·4
Tortosa	E.	83·1	350	e 12 32	− 5	i 22 50	− 8	e 37·3	51·0
	N.	83·1	350	12 29	− 8	i 22 53	− 5	e 37·3	52·0
Toledo		84·6	353	e 12 37	− 9	22 58	−17	e 37·8	58·4
Lisbon		85·9	356	—	—	23 18	−11	e 28·6	—
Algiers		86·7	346	e 12 37	−20	23 23	−15	59·3	—
Granada		87·1	353	i 12 51	− 9	i 23 33	− 9	32·6	66·4
Almeria		87·3	351	12 41	−20	i 23 14	−30	e 45·8	53·7
Malaga		87·6	353	13 14	+11	24 3	+15	—	—
San Fernando		88·1	355	13 11	+ 5	23 28	−25	52·3	56·3
Riverview		89·8	192	e 13 13	− 2	e 23 58	−14	e 43·3	57·9
Adelaide		92·9	201	—	—	i 30 30	?SR_1	e 44·6	63·3
Melbourne		94·6	196	—	—	i 23 42	[−13]	—	115·3
Perth		96·7	221	i 23 7	?[S]	(i 23 7)	[−59]	—	—
La Paz		124·2	68	20 42	?PR_1	33 27	?	61·9	70·9
Rio de Janiero		141·6	44	—	—	e 35 48	?	e 71·2	84·8
Cape Town		148·5	299	—	—	—	—	—	89·1

Additional readings: Ootomari MN = +9·4m. Mizusawa SN = +9m.18s. Osaka MN = +16·6m. Sitka PR_1E = +7m.41s., ePR_1N = +7m.47s., SR_2N = +13m.38s.; T_e 19h.52m.46s. Irkutsk PR_2 = +8m.9s., MN = +22·1m. Zi-ka-wei MN = +23·2m. Honolulu eN = +13m.28s., SR_1N = +18m.8s., SR_1E = +18m.18s., SR_2 = +19m.12s. Taihoku S = +18m.13s. Berkeley readings are given for 21d. Ekaterinburg iPR_1 = +11m.18s., SR_1 = +20m.23s., SR_2 = +22m.41s., MN = +30·1m., MZ = +35·2m. Pulkovo PR_1 = +12m.28s., PR_2 = +13m.55s., SR_2 = +25m.6s., MZ = +39·5m. Kucino PR_1 = +12m.18s., MN = +35·4m. Chicago MN = +39·2m. Konigsberg i = +27m.39s., MN = +45·3m. Ann Arbor SR_1 = +24m.27s., MN = +43·0m. St. Louis PSE = +20m.11s. PSN = +20m.12s., eE = +27m.22s., eEN = +27m.51s. Dyce PR_1? = +15m.45s. Toronto iSE = +19m.46s., iE = +27m.44s. Ottawa ePR_1 = +13m.48s., SR_1 = +24m.29s., SR_2 = +27m.29s.; T_e =19h.52m.56s. Eskdalemuir SR_1 = +24m.48s., SR_2 = +28m.6s. Hamburg MNZ = +43·3m. Ithaca e = +24m.48s. and +27m.18s. De Bilt PR_2Z = +15m.51s., SR_2E = +29m.6s., MZ = +62·5m., MN = +64·2m. Harvard SR_1N = +25m.33s., SR_2E = +28m.36s., eN = +32m.35s., LN = +37·5m. Apia e = +39·3m. Cheltenham eLE = +41·4m. Uccle MN = +47·0m. Vienna PR_1? = +14m.13s., PR_2 = +16m.22s., PS = +21m.48s., SR_1? = +25m.50s., SR_2 = +29m.57s. Strasbourg iPR_1 = +14m.34s., iSR_1 = +26m.20s., SR_2 = +30m.9s., MN = +56·4m. Paris MN = +53·3m. Innsbruck ePNE = +11m.52s. Batavia i = +12m.32s. and +21m.48s. Rocca di Papa eP = +12m.14s., P = +12m.17s., ePN = +12m.19s., LE = +42·3m., LN = +43·7m. Barcelona MN = +51·5m. Toledo iNW = +23m.10s., iNE = +23m.21s., MNW = +60·0m. Granada PR_1 = +16m.25s. San Fernando MN = +55·3m. Riverview eS = +23m.25s., MN = +47·1m. Adelaide eSR_1 = +36m.6s., eL = +53·7m. La Paz LN = +60·9m.

Oct. 20d. Readings also at 0h. (near Tacubaya), 7h. (near La Paz), 13h. (Irkutsk and near Nagasaki), 14h. (Ekaterinburg), 16h. (Apia), 18h. (near Sapporo), 20h. (La Paz), 21h. (Hong Kong, Zi-ka-wei, and Irkutsk), 22h. (Irkutsk, Nagasaki, and Kodaikanal).

Oct. 21d. Readings at 1h. (La Paz), 2h. (Nagasaki (2)), 6h. (Ekaterinburg, La Paz, and Nagasaki), 8h. (La Paz), 9h. (La Paz, Nagoya, near Mizusawa and Osaka), 12h. (Ekaterinburg, Irkutsk, La Paz, Nagoya, and near Manila), 14h. (Ekaterinburg and Irkutsk), 17h. (Taihoku), 19h. (Irkutsk), 21h. (near La Paz), 23h. (Nagoya and Rocca di Papa (2)).

Oct. 22d. Readings at 1h. (Nagasaki), 4h. (Ekaterinburg and La Paz), 6h. (near Tacubaya), 12h. (Ekaterinburg and Irkutsk), 16h. (Perth and Riverview), 18h. (Nagasaki), 20h. (Ekaterinburg), 22h. (near Almeria), 23h. (near Kobe).

Oct. 23d. 12h. 47m. 40s. Epicentre 36°·5N. 139°·5E. (as on 1922 May 9d.).

A = −·611, B = +·522, C = +·595.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa E.	2·9	0 42	− 3	1 9	−11	—	—
Osaka	3·8	1 0	+ 1	—	—	2·0	2·4
Kobe	4·0	1 3	+ 1	—	—	2·1	2·4
Irkutsk	29·2	e 14 20	?L	—	—	e 18·3	—
Ekaterinburg	54·3	—	—	17 18	+ 5	28·3	—

Additional readings: Mizusawa SN = +1m.10s. Osaka MN = +2·9m.

Oct. 23d. 21h. 35m. 40s. Epicentre 50°·0N. 149°·0E.

A = −·551, B = +·331, C = +·766; D = +·515, E = +·857;
G = −·657, H = +·395, K = −·643.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	5·3	233	1 56	+34	—	—	3·2	—
Mizusawa E.	12·2	210	3 5	+ 3	5 24	0	—	—
Osaka	18·2	218	5 15	+56	(7 56)	+12	7·9	8·4
Kobe	18·4	219	4 23	+ 1	—	—	—	4·4
Irkutsk	27·7	292	e 6 7	+ 2	e 10 53	− 1	14·3	—
Manila	42·1	223	e 13 6	?S	(e 13 6)	−90	15·2	—
Ekaterinburg	49·4	315	9 2	− 1	16 17	+ 6	20·3	—
Vienna Z.	73·6	330	e 11 41	+ 1	—	—	—	—
Innsbruck	76·0	332	i 11 55	0	—	—	—	—
Zurich	76·8	334	e 11 58	− 2	—	—	—	—
La Paz	135·1	54	42 49	?SR_1	—	—	—	—

Additional readings: Osaka MN = +8·1m. Vienna iPZ = +11m.43s.

Oct. 23d. Readings also at 12h. (Toledo, Strasbourg, Ottawa, Georgetown, Eskdalemuir, De Bilt, Ekaterinburg, near Taihoku, and near Tacubaya), 13h. (near Mostar), 14h. and 15h. (Irkutsk), 20h. (Irkutsk, Ekaterinburg, near Mizusawa, and Ootomari, near Barcelona, Tortosa, and near Merida and Tacubaya).

Oct. 24d. Readings at 1h. (La Paz and De Bilt), 5h. (La Paz), 10h. (Azores and Toledo), 11h. (Azores, Kobe, Kucino, De Bilt, and Ekaterinburg), 13h. (De Bilt, Ekaterinburg, and Azores), 16h. (Stonyhurst), 17h. (near Granada and Lisbon), 20h. (Honolulu and near Mizusawa), 21h. (Irkutsk, Rocca di Papa, Moncalieri, and near Mizusawa).

Oct. 25d. 19h. 9m. 14s. Epicentre 30°·0N. 28°·0W.

$A = +·765$, $B = -·407$, $C = +·500$; $D = -·469$, $E = -·883$; $G = +·441$, $H = -·235$, $K = -·866$.

Very rough, based chiefly on L. For possible alternative see p. 283.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
San Fernando	19·3	65	4 28	− 5	8 4	− 4	12·5	12·8
Granada	21·5	64	e 5 10	+11	i 9 10	+15	e 14·6	16·8
Tortosa N.	25·6	57	—	—	—	—	e 14·8	18·9
Kew	29·8	36	—	—	—	—	—	50·8
Eskdalemuir	30·9	29	e 8 46	?PR_1	—	—	e 14·8	—
Moncalieri	31·7	52	e 2 29	?	12 7	+ 4	18·2	—
Uccle	31·8	40	—	—	e 8 7	?PR_1	e 14·8	—
Strasbourg	32·9	47	—	—	—	—	e 13·8	20·8
De Bilt	32·9	39	—	—	e 8 31	?PR_1	e 16·8	20·8
Rocca di Papa	34·7	60	—	—	—	—	18·9	24·3
Ottawa	40·1	307	e 11 22	?PR_1	e 16 42	?SR_1	e 21·3	—
Toronto	42·6	304	10 46	?PR_1	—	—	15·0	—
Pulkovo	48·6	35	—	—	—	—	e 30·8	—
Kucino	53·0	41	—	—	e 15 4	−112	26·0	—
Ekaterinburg	64·6	37	—	—	e 43 20	?	54·8	—
Irkutsk	87·8	26	—	—	—	—	47·8	—
Bombay	89·6	68	—	—	23 46?	[+20]	—	—

Additional readings: San Fernando MN = +13·8m. De Bilt MN = +20·6m., MZ = +26·8m. Rocca di Papa eL = +2m.52s.

Oct. 25d. Readings also at 3h. (Vienna, Pompeii, and near Rocca di Papa), 10h. (Azores), 11h. (De Bilt, Uccle, and Ekaterinburg), 15h. (Bombay. Irkutsk, Hong Kong, and near Mizusawa), 16h. (Ekaterinburg), 18h. (Taihoku), 20h. (near Sapporo).

Oct. 26d. 18h. 20m. 28s. Epicentre 7°·0N. 126°·0E.

$A = -·583$, $B = +·803$, $C = +·122$; $D = +·809$, $E = +·588$; $G = -·072$, $H = +·099$, $K = -·993$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	9·0	327	i 2 42	+26	—	—	i 4·4	—
Hong Kong	19·1	325	4 37	+ 7	—	—	—	—
Batavia	23·2	236	i 5 23	+ 4	i 9 23	− 6	i 10·9	—
Irkutsk	48·6	343	e 8 55	− 3	16 10	+ 9	25·5	29·4
Ekaterinburg	70·8	329	i 11 25	+ 3	e 20 42	+ 6	32·5	—
Kucino	83·1	325	12 39	+ 2	23 0	+ 2	39·9	—
Pulkovo	86·8	330	12 56	− 2	23 35	− 4	45·5	56·4
De Bilt	102·5	327	—	—	—	—	e 52·5	66·2
Strasbourg	102·7	324	—	—	—	—	—	63·5
Toledo	114·3	320	—	—	—	—	e 54·1	63·7
Granada	115·5	316	—	—	—	—	i 64·9	74·6

Additional readings: Irkutsk eP = +12m.21s., i = +13m.11s., and +13m.17s. Ekaterinburg PS = +21m.8s. Toledo readings have been increased by 1h. Granada L = +67·3m. Eskdalemuir gives 19h. simply.

Oct. 26d. Readings also at 12h. (Ekaterinburg), 14h. (near Athens), 20h. (near Manila).

Oct. 27d. 19h. 56m. 52s. Epicentre 7°·0N. 126°·0E. (as on 26d.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		9·0	327	i 2 27	+11	—	—	i 5·0	5·7
Taihoku		18·5	347	e 4 20	− 3	—	—	—	—
Hong Kong		19·1	325	4 28	− 2	(7 48)	−16	7·8	11·3
Batavia		23·2	236	i 5 11	− 8	i 9 19	−10	e 17·1	—
Malabar		23·2	232	5 11	− 8	i 9 15	−14	e 14·7	—
Zi-ka-wei		24·6	351	e 5 33	− 1	e 9 53	− 2	—	—
Osaka		29·0	16	6 39	+21	(11 24)	+ 7	11·4	12·7
Mizusawa		34·9	21	7 24	+12	12 52	− 2	18·0	—
Calcutta	E.	39·4	297	7 34	−16	—	—	16·4	—
	N.	39·4	297	7 36	−14	13 36	−21	—	—
Perth		40·1	194	7 55	− 1	(13 47)	−21	17·6	—
Colombo		45·8	273	8 38	− 1	16 8?	+43	28·6	30·3
Riverview		47·3	152	e 9 9	+20	e 15 53	+ 8	e 18·7	19·8
Hyderabad		47·5	288	8 39	−12	15 19	−29	23·3	32·0
Kodaikanal		48·1	278	15 32	?S	(15 32)	−23	29·0	33·0
Melbourne		48·2	160	—	—	i 15 26	−30	25·6	31·1
Irkutsk		48·6	343	e 8 58	0	i 16 2	+ 1	23·1	26·2
Simla	E.	51·5	306	—	—	e 16 20	−18	—	—
Bombay		52·9	289	9 23	− 2	16 36	−19	26·0	—
Ekaterinburg		70·8	329	i 11 28	+ 6	i 20 36	0	30·6	47·4
Honolulu		74·4	70	—	—	—	—	e 35·1	—
Kucino		83·1	325	e 12 43	+ 6	i 22 51	−7	38·8	57·5
Pulkovo		86·8	330	12 57	− 1	23 27	−12	46·1	54·5
Upsala		93·0	332	—	—	e 24 14	−31	e 49·1	58·0
Konigsberg		93·0	326	—	—	i 24 2	[+16]	e 45·1	51·1
Vienna		97·5	322	e 14 0	+ 3	—	—	e 52·1	65·1
Victoria	E.	98·1	40	—	—	—	—	47·0	48·3
Hamburg		99·2	327	—	—	25 8	−40	e 50·1	61·1
Florence		102·4	317	e 17 8	[−48]	25 38	−41	54·1	61·1
De Bilt		102·5	327	—	—	e 25 56	−24	e 48·1	59·2
Strasbourg		102·7	324	e 14 38	+14	e 23 8?	?	43·1	57·1
Dyce		103·2	335	—	—	25 40	−46	49·2	57·8
Uccle		103·6	325	—	—	e 25 8	[+27]	e 49·1	58·8
Moncalieri		104·2	320	e 14 50	+19	27 16	+41	58·0	—
Besançon		104·3	322	—	—	—	—	—	64·1
Edinburgh		104·5	333	e 17 8	[−55]	e 26 8	−30	51·1	59·1
Eskdalemuir		104·9	333	—	—	e 26 10	−31	51·1	—
Stonyhurst		105·4	331	e 13 28	−68	—	—	—	65·1
Paris		105·6	324	—	—	e 25 8	[+18]	56·1	61·1
Kew		105·7	330	—	—	—	—	—	66·1
Oxford		106·0	330	—	—	—	—	52·1	64·9
Cape Town		108·4	236	25 16	?[S]	(25 16)	[+13]	—	—
Tortosa	N.	110·8	319	—	—	—	—	e 54·1	—
Toledo		114·3	320	—	—	—	—	e 55·0	66·1
San Fernando		117·6	317	—	—	e 42 50	?	64·1	82·1
Ottawa		124·1	17	e 20 59	?PR_1	—	—	74·1	—
Toronto	N.	124·4	21	—	—	e 28 1	−81	66·4	—

Additional readings and notes: Manila MN = +5·6m. Osaka MN = +15·4m. Mizusawa PN = +7m.23s. Perth P = +5m.58s., PR_1? = +9m.29s., S? = +11m.38s.; true S is given as an L. Riverview PS = +16m.8s., MN = +33·4m. Simla eN = +16m.26s. Ekaterinburg SR_1 = +25m.16s., SR_2 = +28m.38s., MN = +41·6m., MZ = +47·5m. Kucino SR_1 = +28m.23s., MN = +44·8m. Upsala MN = +51·9m. Konigsberg e = +27m.2s. Vienna P? = +17m.33s., PR_1? = +18m.28s. Bergen (Δ = 98°·2) gives simply 20h. Hamburg MN = +53·1m. De Bilt e = +32m.59s., MN = +61·0m., MZ = +64·2m. Dyce S = +32m.15s., e = +38m.5s. Eskdalemuir e = +33m.36s. and +42m.45s. Toledo MNW = +65·9m.; all readings have been increased by 1h. San Fernando ePR_1 = +33m.26s. Ottawa eE = +21m.14s., e = +31m.12s., eL = +38·1m. Toronto e = +31m.23s.

Oct. 27d. 20h. 48m. 48s. Epicentre 7°·0N. 126°·0E. (as at 19h.).

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	9·0	327	e 3 3	+47	—	—	i 5·3	—
Batavia	23·2	236	15 7	−12	i 9 13	−16	—	—
Zi-ka-wei	24·6	351	e 5 35	+ 1	—	—	—	—
Irkutsk	48·6	343	e 9 2	+ 4	15 59	− 2	25·2	—
Ekaterinburg	70·8	329	i 11 27	+ 5	i 20 35	− 1	28·7	—

No additional readings.

Oct. 27d. Readings also at 9h. (Calcutta and near Nagasaki), 10h. (Bombay and Ekaterinburg), 11h. (near Tacubaya and Manzanillo), 17h. (Balboa Heights, near Osaka, and Kobe), 20h. (Kobe).

Oct. 28d. Readings at 1h. (Ekaterinburg), 2h. (Pulkovo), 9h. (near Granada and near Wellington), 14h. (Mizusawa), 15h. and 16h. (Nagasaki).

Oct. 29d. Readings at 3h. (near Mizusawa), 8h. and 11h. (Apia), 16h. (Ekaterinburg), 21h. (near Merida).

Oct. 30d. Readings at 2h. (Ekaterinburg), 5h. (Kobe), 6h. (Nagasaki), 7h. (Hong Kong, Taihoku (2), Ekaterinburg, and Pulkovo), 8h. (Ekaterinburg and Pulkovo), 12h. (Ekaterinburg), 19h. (Baku), 20h. (Ekaterinburg), 21h. (Taihoku).

Oct. 31d. 2h. 58m. 40s. Epicentre 6°·5S. 126°·0E. (as on 1924 Sept. 10d.).

$A = -\cdot584$, $B = +\cdot804$, $C = -\cdot113$; $D = +\cdot809$, $E = +\cdot588$; $G = +\cdot067$, $H = -\cdot092$, $K = -\cdot994$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	19·0	270	i 4 35	+ 6	i 8 22	+20	e 16·3	—
Manila	21·7	346	e 5 7	+ 6	(i 9 6)	+ 7	i 9·1	9·7
Perth	27·2	199	—	—	—	—	e 30·8	—
Adelaide	30·8	159	—	—	i 16 2	?L	(i 16·0)	19·3
Hong Kong	31·0	339	—	—	—	—	—	11·7
Melbourne	35·7	153	—	—	e 11 56	−70	—	22·3
Riverview	35·9	143	e 6 43	−38	e 11 45	−84	e 15·3	19·6
Sydney	35·9	143	7 32	+11	—	—	18·3	19·7
Bombay	58·2	298	18 16	?S	(18 16)	+15	—	—
Ekaterinburg	82·4	330	i 12 26	− 6	e 22 46	− 4	34·3	—
Baku	83·7	314	e 12 36	− 4	e 23 2	− 4	41·8	—
Kucino	94·2	326	—	—	e 29 20	?SR_1	47·8	—

Additional readings: Manila MN = +9·8m. Riverview MZ = +18·6m., MN = +19·0m. Ekaterinburg PR_1 = +15m.38s. Kucino e = +38m.20s.

Oct. 31d. Readings also at 5h. (Tortosa), 11h. (near Mizusawa), 16h. (Riverview), 17h. (Ekaterinburg), 18h. (Irkutsk), 19h. (Irkutsk, Ekaterinburg, Baku, and Pulkovo), 20h. (Manila).

Nov. 1d. 4h. 55m. 15s. Epicentre 9°·5N. 84°·0W. (as on 1924 Mar. 28d.).

$A = +\cdot103$, $B = -\cdot981$, $C = +\cdot165$; $D = -\cdot995$, $E = -\cdot105$; $G = +\cdot017$, $H = -\cdot164$. $K = -\cdot986$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		4·4	96	0 45	−23	—	—	—	—
Merida		12·6	335	7 23	+256	9 47	+253	7·1	11·0
Vera Cruz		15·2	312	—	—	6 13?	−24	6·8	7·9
Tacubaya		17·7	305	4 15	+ 2	7 36	+ 3	—	—
Porto Rico	E.	20·0	62	e 5 32	+51	9 35	+72	e 14·8	—
	N.	20·0	62	e 5 40	+59	e 8 41	+18	e 18·5	—
Georgetown		30·0	11	6 31	+ 3	13 15	+101	e 17·0	—
Chicago	N.	32·4	355	6 53	+ 1	12 22	+ 8	19·5	—
Fordham		32·6	15	i 7 11	+18	12 43	+25	17·6	19·3
Ann Arbor		32·8	0	7 27	+32	13 21	+60	18·0	25·0
Ithaca		33·5	10	—	—	—	—	17·8	—
Toronto	E.	34·4	6	e 7 15	+ 7	e 12 53	+ 7	e 16·8	21·4
Harvard		34·8	17	7 29	+18	12 57	+ 5	e 20·9	22·0
Ottawa		36·6	10	7 37	+10	13 34	+16	e 18·3	22·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria	E.	51·0	327	—	—	—	—	30·4	35·6
	N.	51·0	327	—	—	—	—	28·7	36·1
San Fernando	N.	74·5	55	—	—	—	—	—	44·2
Toledo		76·3	51	—	—	—	—	e 42·1	44·8
Uccle		81·6	40	—	—	—	—	e 37·8	45·8
De Bilt	E.	82·0	38	—	—	e 24 33	+107	e 39·8	46·9
Strasbourg		84·1	42	—	—	—	—	e 42·8	—
Hamburg		84·7	37	—	—	—	—	e 47·8	—
Upsala		87·6	29	—	—	—	—	e 53·8	—
Pulkovo		93·5	27	—	—	—	—	44·8	53·0
Kucino		99·0	29	—	—	—	—	49·9	52·8
Ekaterinburg		107·6	19	—	—	e 25 26	[+27]	49·8	61·2
Bombay		143·5	38	—	—	—	—	79·8	—

Additional readings and notes: Vera Cruz readings have been increased by 1h. Tacubaya S has been increased by 1h. Porto Rico eN = +10m.28s. Georgetown eLN = +17·4m. Chicago L = +27·5m. Ann Arbor SR_3 = +15m.57s., MN = +23·0m. Harvard PR_1E = +8m.37s., eLN = +20·6m., MN = +22·9m. Toronto eSN = +12m.51s. Ottawa PR_1N = +8m.56s., SRN = +15m.50s.; T_0 = 4h.55m.21s. De Bilt eLN = +36·7m., MN = +45·9m., MZ = +47·2m. Ekaterinburg e = +28m.49s.

Nov. 1d. Readings also at 0h. (Riverview), 1h. (Rocca di Papa, Perth, Ekaterinburg, Ottawa, and Toronto), 2h. (De Bilt), 3h. (Nagasaki), 6h. (Apia, Bombay, and Tacubaya), 7h. (Melbourne), 8h. (Riverview, Wellington, and Adelaide), 9h. (Ekaterinburg and Bombay), 11h. (Athens and Manila), 15h. (Manila), 17h. (Amboina).

Nov. 2d. 11h. 25m. 0s. Epicentre 24°·0N. 120°·0E. (as on 1923 Dec. 4d.).

A = −·457, B = +·792, C = +·407; D = +·866, E = +·500; G = −·204, H = +·352, K = −·914.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hokoto	0·6	222	0 28	+19	—	—	0·7	—
Taihoku	1·8	53	0 31	+ 3	—	—	1·1	1·2
Hong Kong	5·6	254	—	—	—	—	—	4·2
Manila	9·5	172	e 3 0	+37	4 18	+ 2	4·3	—
Irkutsk	30·7	342	e 6 35	0	e 11 33	−13	16·0	20·3
Ekaterinburg	53·5	325	—	—	—	—	26·0	29·7
Pulkovo	69·3	327	—	—	—	—	e 42·0	44·6

Nov. 2d. Readings also at 5h. (Apia), 6h. (Belgrade), 7h. (Tacubaya), 10h. (Zi-ka-wei and Taihoku), 18h. (Taihoku, Apia, and near Athens), 19h. and 21h. (Manila).

Nov. 3d. 19h. 0m. 45s. Epicentre 8°·5S. 67°·0E. (as on 1922 July 3d.).

A = +·386, B = +·910, C = −·148; D = +·920, E = −·391; G = −·058, H = −·136, K = −·989.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Colombo	20·0	40	8 50	?S	(8 50)	+27	—	11·3
Kodaikanal	21·4	29	9 3	?S	(9 3)	+10	10·9	11·6
Bombay	28·0	12	6 56	+48	10 41	−18	—	—
Hyderabad	28·3	23	e 10 15	?S	(10 15)	−49	—	15·0
Perth	50·9	125	e 21 27	$?SR_1$	—	—	—	24·1
Baku	51·4	345	—	—	—	—	e 16·6	—
Ekaterinburg	65·5	356	e 10 40	− 8	19 20	−11	28·3	—
Pulkovo	74·2	343	—	—	21 15	− 1	—	—

Pulkovo gives also e = +25m.58s. ($?SR_1$).

Nov. 3d. Readings also at 3h. (Batavia and Perth), 4h. (Victoria), 6h. (Manzanillo), 9h. (Zurich), 21h. (Paris and near Venice), 23h. (Apia).

Nov. 4d. 3h. 2m. 45s. Epicentre 49°·0S. 132°·0W. (as on 1922 Feb. 2d.).

A = −·439, B = −·488, C = −·755 ; D = −·743, E = +·669 ; G = +·505, H = +·561, K = −·656.

The American stations suggest a possible second shock.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	57·1	255	e 17 48	?S	(e 17 48)	+ 1	—	24·1
Sydney	57·1	255	9 57	+ 4	—	—	23·2	24·8
Adelaide	63·1	246	—	—	e 18 45	−17	e 23·5	26·2
Victoria E.	97·6	6	30 25	—	—	—	51·9	53·6
Chicago	98·8	31	—	—	—	—	68·7	—
Toronto	103·4	36	—	—	—	—	73·2	—
Ottawa	106·3	38	—	—	—	—	73·2	—
Eskdalemuir	148·7	59	—	—	—	—	69·2	—
Uccle	152·2	69	—	—	—	—	62·2	—
De Bilt	153·0	67	—	—	—	—	e 67·2	—
Strasbourg	153·8	75	—	—	—	—	e 73·2	—
Pulkovo	165·1	37	—	—	—	—	58·8	70·6
Ekaterinburg	169·1	321	—	—	e 30 15	?	44·2	—
Kucino	170·9	38	—	—	—	—	e 57·2	—

Additional readings and notes: Riverview gives eS = +22m.33s., MN = +24·9m. Adelaide iSR$_1$ = +20m.51s., e = +24m.27s. Chicago N = +65m.50s. Toronto eLN = +71·9m. Ottawa eN = +66m.41s., eL = +68·3m., LN = +77·3m. De Bilt e = +62m.15s. Pulkovo MZ = +70·5m.

Nov. 4d.—Readings also at 0h. (Berkeley), 2h. (Baku), 3h. (Manila), 4h. (Perth), 7h. (Rio Tinto), 8h. (near Mizusawa), 9h. (near Manzanillo), 11h. (near Victoria), 12h. (La Plata), 14h. (Apia), 19h. (Kobe).

Nov. 5d. 8h. 30m. 50s. Epicentre 19°·0S. 173°·0W. (as on 1922 Dec. 23d.).

A = −·939, B = −·115, C = −·326 ; D = −·122, E = +·993 ; G = +·323, H = +·040, K = −·946.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	5·3	13	e 2 23	?S	(2 23)	+ 1	3·3	4·3
Suva	8·2	275	2 4	0	—	—	3·9	—
Wellington	24·6	202	6 20	+46	10 42	+47	12·7	18·2
Riverview	35·1	237	—	—	e 8 39	?PR$_1$	e 15·3	20·3
Sydney	35·1	237	—	—	13 4	+ 7	18·5	20·9
Honolulu	42·9	21	—	—	—	—	i 18·9	19·3
Perth	64·5	244	—	—	—	—	e 34·2	—
Manila	73·2	293	e 12 4	+27	—	—	13·6	—
Batavia	78·7	269	i 12 10	− 1	i 22 4	− 4	—	—
Victoria	80·7	30	22 32	?S	(22 32)	+ 1	39·3	42·6
Toronto	105·5	49	—	—	—	—	57·6	—
Ottawa	108·4	47	—	—	—	—	e 57·2	—
Ekaterinburg	125·4	327	i 20 54	?PR$_1$	—	—	41·2	72·0
Pulkovo	136·0	343	e 19 28	[− 4]	e 22 7	?PR$_1$	72·2	85·2
Baku	137·6	310	i 21 38	?PR$_1$	e 35 20	?	63·3	90·8
Edinburgh	142·3	11	—	—	—	—	e 76·2	—
Hamburg	145·3	358	e 19 43	[− 6]	—	—	e 84·2	—
De Bilt	146·5	2	e 21 16	?	e 42 28	?SR$_1$	e 79·2	—
Uccle	148·1	4	—	—	—	—	e 79·2	—
Strasbourg	150·4	359	—	—	—	—	e 74·2	—
Granada	159·6	25	i 53 54	?	i 72 47	?	e 84·8	90·6

Additional readings and notes: Apia MV = +9·2m. Riverview MN = +19·4m. Honolulu eN = +20m.59s., MN = +24·9m. Victoria PN = +22m.29s. (?S), MN = +44·1m. Ottawa e?N = +50m.10s. Ekaterinburg MN = +71·8m. Pulkovo MZ = +84·7m. Baku MZ = +80·1m., MN = +91·0m. Granada i = +54m.41s.

Nov. 5d. 18h. 54m. 20s. Epicentre 35°·3N. 3°·5E.

A = +·815, B = +·050, C = +·578 ; D = +·061, E = −·998 ;
G = +·577, H = +·035, K = −·816.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Algiers	1·5	346	i 0 14	− 9	—	—	0·5	1·3
Almeria	5·0	290	i 1 22	+ 5	2 18	+ 1	i 2·5	3·2
Granada	6·0	290	1 36	+ 4	i 2 41	− 3	e 3·1	7·3
Tortosa	6·0	338	1 24	− 8	2 23	−21	e 3·3	5·7
Barcelona	6·2	350	1 26	− 9	2 19	−30	2·7	3·9
Malaga	6·6	285	2 4	+23	3 16	+16	4·2	6·4
Toledo	7·5	310	e 1 45	− 9	e 3 1	−23	e 3·5	4·1
San Fernando	8·0	281	—	—	3 53	+16	—	10·7
Rocca di Papa	9·8	46	—	—	e 4 11	−12	—	7·3
Moncalieri	10·3	17	e 2 56	+22	—	—	7·8	11·0
Florence	10·3	33	e 2 10	−24	—	—	—	9·7
Lisbon	10·6	292	i 5 4	?S	(i 5 4)	+19	—	—
Besançon	12·0	8	—	—	—	—	e 7·1	—
Paris	13·6	357	—	—	—	—	e 7·7	9·7
Strasbourg	13·7	12	—	—	—	—	e 6·7	—
Uccle	15·5	2	e 3 39	− 7	—	—	e 6·2	—
Kew	16·4	351	—	—	—	—	—	8·7
Oxford	16·8	350	—	—	—	—	8·4	11·3
De Bilt	16·9	4	3 59	− 5	—	—	7·6	9·2
Hamburg	18·9	12	e 4 23	− 5	—	—	e 9·7	10·7
Stonyhurst	19·0	349	—	—	—	—	e 9·7	—
Eskdalemuir	20·6	349	e 4 39	− 9	—	—	10·2	—
Edinburgh	21·2	350	—	—	—	—	e 10·7	—
Pulkovo	30·0	27	—	—	—	—	15·7	—
Kucino	31·1	38	—	—	—	—	e 17·7	—
Ekaterinburg	43·5	42	e 8 9	−13	e 14 52	− 3	20·7	—

Additional readings and notes: Algiers M = +5·1m. Almeria MN = +3·9m. Granada iP = +1m.41s., i = +2m.0s., MN = +6·4m., MZ = +3·6m. Tortosa SN = +2m.26s. Malaga readings have been increased by 4m. Toledo P = +2m.12s., MNZ = +7·3m. ; Epicentre 37°·0N. 2°·7E. Rocca di Papa eN = +4m.41s., MN = +7·4m., M = +13·7m. Moncalieri readings have been increased by 4m. Florence readings have been increased by 2m. De Bilt LN = +8·4m., MN = +10·2m., MZ = +13·9m. Hamburg MN = +12·7m.

Repetitions recorded at Algiers at the following times :—

h.	m.	s.	h.	m.	s.	h.	m.	s.
19	2	55	20	46	37	21	58	17
19	10	47	20	49	38	23	18	34
19	33	11	21	6	8	23	19	58
20	38	8	21	11	52	23	46	3

To be continued on Nov. 6d.

Nov. 5d. Readings also at 1h. (Riverview and Ekaterinburg), 4h. (Algiers), 8h. (Apia), 17h. (Baku (2) and Ksara), 18h. (Ekaterinburg and Tacubaya). 21h. (Ekaterinburg), 23h. (Riverview, Victoria, and Azores).

Nov. 6d. 7h. 46m. 0s. Epicentre 35°·7N. 81°·0E. (as on 1920 Oct. 12d.).

A = +·127, B = +·802, C = +·584 ; D = +·988, E = −·156 ;
G = +·091, H = +·576, K = −·812.

Very rough.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Bombay	18·3	205	8 46	?S	(8 46)	+59	—	11·6
Baku	24·8	290	—	—	—	—	14·7!	18·4
Ekaterinburg	25·2	333	5 37	− 3	e 10 16	+ 9	i 13·8	16·4
Kucino	35·3	318	—	—	—	—	17·5	—
Pulkovo	40·2	323	—	—	—	—	24·0	27·0
De Bilt	54·4	314	—	—	—	—	e 30·0	—
Eskdalemuir	58·2	320	—	—	—	—	30·0	—

Additional reading: Baku MZ = +25·2m.

Nov. 6d. 17h. 57m. 40s. Epicentre 35°·3N. 3°·5E. (as on Nov. 5d.).

A = +·815, B = +·050, C = +·578.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Algiers	1·5	346	0 32	+ 9	—	—	0·7	—
Tortosa	6·0	338	e 2 36	?S	(e 2 36)	− 8	—	5·2
Moncalieri	10·3	17	2 26	− 8	4 54	+17	6·3	—
Oxford	16·8	350	—	—	—	—	9·9	—

Nov. 6d. 18h. 40m. 20s. Epicentre 35°·3N. 3°·5E. (as at 17h.).

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Algiers	1·5	346	0 21	− 2	—	—	0·6	1·1
Tortosa	6·0	338	1 42	+10	—	—	—	5·4
Moncalieri	10·3	17	—	—	—	—	e 6·2	—

Nov. 6d. 22h. 59m. 45s. Epicentre 35°·3N. 3°·5E. (as at 18h.).

A = +·815, B = +·050, C = +·578; D = +·061, E = −·998;
G = +·577, H = +·035, K = −·816.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Algiers	1·5	346	0 13	−10	—	—	0·4	—
Granada	6·0	290	i 1 52	+20	i 2 53	+ 9	e 3·1	5·6
Tortosa N.	6·0	338	e 1 18	−14	2 18	−26	—	5·7
Rocca di Papa	9·8	46	—	—	—	—	6·4	7·6
Moncalieri	10·3	17	(3 15)	+41	3 15?	?P	5·4	—
Strasbourg	13·7	12	—	—	—	—	6·3	—
Uccle	15·5	2	—	—	—	—	e 7·3	—
Oxford	16·8	350	5 35	+93	—	—	—	—
De Bilt	16·9	4	—	—	—	—	e 8·3	—
Stonyhurst	19·0	349	—	—	—	—	e 9·8	—
Eskdalemuir	20·6	349	—	—	—	—	10·3	—
Edinburgh	21·2	350	—	—	—	—	10·3	—

Additional reading: Moncalieri e = +0m.26s.

Nov. 6d. There are also a number of presumable repetitions from the epicentre 35°·3N. 3°·5E. recorded only at Algiers. The following list is a continuation of that for Nov. 5d., and represents P at Algiers.

h.	m.	s.	h.	m.	s.	h.	m.	s.
0	12	34	13	11	5	20	27	3
0	45	13	16	12	51	(22	59	58)
2	17	29	16	31	12	23	2	3
4	46	6	17	7	24	23	16	44
5	4	57	(17	58	12)	23	18	5
5	5	26	18	7	19	23	23	16
5	7	38	(18	40	41)	23	42·	35
10	11	6	19	32	41			

In a few cases additional phases are given: L = 5h.5m.29s., M = 5h.5m.35s. (Moncalieri gives eL = 5h.13m.41s.), LM = 16h.13m.0s., LM = 17h.7m.28s., LM = 19h.32m.47s. And for the three in brackets further details are given above.

Nov. 6d. Readings also at 0h. (Riverview), 2h. (Granada and Ksara), 3h. (Victoria and near Mizusawa), 8h. (Ksara), 10h. (Kobe), 13h. (Apia), 16h. (La Paz), 20h. (near Osaka and Kobe (2)), 22h. (Amboina).

Nov. 7d. 10h. 54m. 20s. Epicentre 47°·0N. 10°·0E. (as on 1924 May 21d.).

A = +·672, B = +·118, C = +·731; D = +·174, E = −·985;
G = +·720, H = +·127, K = −·682.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Zurich	1·0	i 0 14	− 1	i 0 20	− 8	—	—
Innsbruck	1·0	i 0 58	+43	—	—	—	—
Strasbourg	2·2	0 49	+15	1 12	+12	1·4	—
Besançon	2·7	i 1 16	?S	(i 1 16)	+ 2	—	—

Nov. 7d. Continuation of list of values of P at Algiers for shocks from epicentre 35°·3N. 3°·5E. as on Nov. 6d.

h.	m.	s.	h.	m.	s.	h.	m.	s.
0	20	32	5	48	15	13	5	49
3	19	50	6	3	43	14	34	14
3	46	28	7	3	35	15	47	37
5	25	47	9	37	10	16	6	50
5	30	54	10	28	26	19	2	27
						21	17	40

LM phases in addition at 5h.48m.26s., 7h.3m.40s., 13h.6m.0s.

Nov. 7d. Readings also at 1h. (near Athens), 20h. (Azores).

Nov. 8d. 9h. 5m. 0s. Epicentre 35°·5N. 48°·0E.

A = +·545, B = +·605, C = +·581; D = +·743, E = −·669;
G = +·389, H = +·432, K = −·814.

See Note at end.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m
Baku	5·1	17	i 1 58	+39	2 23	+ 3	3·7	6·5
Ksara	10·1	264	2 50	+19	(4 38)	+16	—	—
Helwan	15·1	253	4 1	+21	7 12	+38	—	11·2
Athens	19·5	284	e 4 32	− 3	7 46	−27	e 9·9	11·5
Kucino	21·4	344	i 4 44	−14	i 8 11	−42	8·8	11·5
Ekaterinburg	23·0	18	i 5 23	+ 6	i 9 16	− 9	11·0	13·3
Vienna	26·5	309	5 45	− 8	i 9 47	−45	i 10·4	17·0
Pompeii	26·7	292	e 5 42	−13	e 10 12	−23	—	—
Pulkovo	26·8	340	i 5 45	−11	i 9 53	−44	12·0	15·4
Konigsberg	27·0	324	5 54	− 4	10 48	+ 7	—	18·0
Bombay	27·5	121	6 51	+48	—	—	—	—
Rocca di Papa	28·1	294	5 42	−27	—	—	—	6·1
Florence	29·2	297	6 30	+10	11 45	+25	17·0	25·0
Innsbruck	29·5	305	e 6 14	− 9	e 10 30	−56	—	—
Upsala	31·3	330	e 6 9	−32	—	—	—	18·6
Moncalieri	31·8	300	6 8	−37	11 4	−61	16·1	20·8
Hamburg	32·0	317	e 6 30	−17	e 11 40	−28	18·0	20·7
Strasbourg	32·2	307	e 6 0?	−50	e 11 37	−34	e 20·0	—
Hyderabad	32·5	107	—	—	—	—	—	22·5
Besançon	33·1	304	—	—	12 0?	−26	—	—
De Bilt	34·4	313	6 53	−15	12 11	−35	e 18·0	—
Uccle	34·7	310	—	—	(11 0)	−111	e 11·0	—
Paris	35·3	307	—	—	—	—	e 20·0	24·0
Edinburgh	39·9	316	—	—	e 17 0	+175	—	—
Granada	41·1	287	8 6	+ 2	i 14 23	+ 1	—	—
Cape Town	74·7	205	—	—	—	—	—	42·1

Nov. 8d. 9h. Additional readings and notes: Baku P = +2m.5s. Kucino readings have been increased by 3m. Ksara PR_1 = +3m.38s., PR_2 = +3m.41s., R_2P_4S = +4m.11s., R_2P_2S = +4m.51s., R_4P_2S = +5m.17s. Ekaterinburg MN = +16·0m., MZ = +16·1m. Vienna 1Z = +6m.40s., iPR_2? = +8m.11s. Pulkovo MZ = +14·9m. Konigsberg e = 10m.0s. Rocca di Papa eE = +6m.5s.

It will be seen in these notes that Ekaterinburg and Pulkovo give accordant determinations for an epicentre near 38°N. 41°E. Accordingly this was adopted for trial in the first instance but the residuals were large. A few of them may be given :—

	Δ	δP.	δS.		Δ	δP.	δS.
	°	s.	s.		°	s.	s.
Baku	7·3	+ 7	− 75	Ekaterinburg	22·9	+ 7	− 7
Ksara	5·7	+82	+159	Pulkovo	22·9	+29	+ 30
Helwan	11·3	+72	+130	Florence	23·1	+72	+138
Athens	13·6	+71	+108	Strasbourg	26·2	+10	+ 71
Pompeii	20·5	+55	+ 98	De Bilt	28·5	+40	+ 63
Vienna	20·5	+58	+ 73	Bombay	33·6	−10	
Konigsberg	21·7	+53	+109	Granada	35·5	+48	+ 80

The method of determining the epicentre from a single station is thus liable to considerable error ; at present at any rate we cannot look to the method of azimuths as likely to give a better epicentre than can be obtained by using the table for P and S.

Nov. 8d. 17h. 45m. 20s. Epicentre 35°·5N. 48°·0E (as at 9h.).

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Ekaterinburg	23·0	e 5 30	+13	9 14	−11	11·7	—
Simla	24·0	4 34	−54	—	—	—	—
Irkutsk	42·6	(e 8 6)	− 9	e 8 6	?P	11·4	—

To presume that this is a repetition involves a rather unlikely combination of errors. Simla must be 1min. wrong, and Irkutsk S must be P, and L something else. Moreover it is curious that Simla and Irkutsk, which do not record the main shock, should record this. Altogether it seems probable that the epicentre should be different—say near 42°N. 80°E.

Nov. 8d. Continuation of list of values of P at Algiers from epicentre 35°·3N. 3°·5E. as on Nov. 7d. :—

h.	m.	s.	h.	m.	s.	h.	m.	s.
2	6	37	16	43	16	22	39	11
7	30	0	17	16	40	23	30	28
8	10	25	21	24	6			
11	29	25	22	36	0			

LM phase in addition at 22h.36m.10s.

Nov. 8d. Readings also at 2h. (Ksara, near Sapporo, and Mizusawa), 3h. (Ekaterinburg), 5h. (Taihoku), 8h. (Tacubaya and Vera Cruz), 9h. (Puebla and Tacubaya (2) and Vienna), 10h. (near Tacubaya), 14h. (Nagasaki).

Nov. 9d. 1h. 13m. 35s. Epicentre 52°·0N. 103°·0E.

A = −·139, B = +·600, C = +·788.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Irkutsk	0·8	e 0 14	+ 2	0 26	+ 4	0·5	—
Ekaterinburg	24·7	e 5 31	− 4	—	—	12·4	—
Pulkovo	39·5	—	—	—	—	23·4	26·7
De Bilt	55·3	—	—	—	—	e 31·4	—
Strasbourg	56·4	—	—	—	—	35·4	—

Additional reading : Pulkovo MZ = +25·6m.

Nov. 9d. 12h. 48m. 20s. Epicentre 52°·5N. 157°·5E. (as on 1922 Aug. 16d.).

$A = -\cdot562$, $B = +\cdot233$, $C = +\cdot793$; $D = +\cdot383$, $E = +\cdot924$; $G = -\cdot733$, $H = +\cdot304$, $K = -\cdot609$.

The absence of any Japanese observations throws doubt on this solution.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Irkutsk	31·7	290	—	—	—	—	14·7	—
Hong Kong	44·6	244	—	—	—	—	—	32·2
Victoria N.	48·0	61	—	—	—	—	19·6	29·6
Ekaterinburg	51·4	316	e 9 13	− 3	e 16 38	+ 2	23·7	29·4
Baku	68·0	309	—	—	e 27 14	?SR_1	32·5	40·9

Additional readings and notes: Victoria LE = +23·2m. Ekaterinburg MN = +29·6m., MZ = +34·2m.

Nov. 9d. Continuation of list of values of P at Algiers from epicentre 35°·3N. 3°·5E. of Nov. 8d.

h.	m.	s.	h.	m.	s.	h.	m.	s.
1	4	19	5	32	20	11	53	0
1	6	15	5	40	39	12	15	54
1	30	46	5	47	2	15	0	33

Nov. 9d. Readings also at 0h. (near Ksara and near Mizusawa), 1h. (near Baku and near Irkutsk), 4h. (Wellington), 5h. (Victoria, Taihoku (2), and Ekaterinburg), 6h. (near Manila), 10h. (near Batavia and Malabar), 12h. (Baku), 13h. (Kucino), 14h. (Irkutsk), 21h. (near (Mizusawa), 22h. (Ekaterinburg, Irkutsk, Apia, and Kucino).

Nov. 10d. 21h. 8m. 56s. Epicentre 35°·5N. 48°·0E. (as on Nov. 8d.).

$A = +\cdot545$, $B = +\cdot605$, $C = +\cdot581$; $D = +\cdot743$, $E = -\cdot669$; $G = +\cdot389$, $H = +\cdot432$, $K = -\cdot814$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Baku	5·1	17	e 2 20	+61	e 3 27	+67	4·1	5·9
Ekaterinburg	23·0	18	5 16	− 1	9 13	−12	12·1	—
Pulkovo	26·8	340	e 5 49	− 7	e 9 58	−39	—	—
Irkutsk	42·6	48	—	—	—	—	e 27·1	—

No additional readings.

Nov. 10d. 21h. 54m. 56s. Epicentre 35°·5N. 48°·0E. (as at 21h. 8m.).

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Baku	5·1	17	e 2 48	+89	3 55	+95	4·4	5·0
Athens	19·5	284	—	—	—	—	e 11·3	—
Kucino	21·4	344	—	—	e 9 32	+37	—	11·2
Ekaterinburg	23·0	18	5 33	+16	9 27	+ 2	12·1	15·0
Vienna	26·5	309	5 40	−13	—	—	—	—
Pulkovo	26·8	340	5 43	−13	9 43	−54	10·6	14·9
De Bilt	34·4	313	—	—	e 15 4	?SR_1	—	—
Irkutsk	42·6	48	—	—	e 16 14	?SR_1	24·1	—

Additional readings and notes: Baku e = +2m.54s., e = +4m.20s. (which may be the P and S of another shock), MZ = +5·8m., MN = +6·1m.; also e = 22h.23m.25s., L = 22h.25m. (yet another repetition ?). Kucino e_1 = +8m.5s., iP = +8m.10s. Ekaterinburg MZ = +16·7m. Pulkovo MZ = +15·0m. Irkutsk e = +18m.58s.

Nov. 10d. Continuation of values of P at Algiers from epicentre 35°·3N. 3°·5E., as on Nov. 9d. :—

h.	m.	s.	h.	m.	s.	h.	m.	s.
0	56	18	1	48	9	18	52	58

Nov. 10d. Readings also at 3h. (La Paz), 4h. (Mizusawa), 6h. (Mizusawa and Manila), 11h. (La Paz), 12h. (Apia), 20h. (Ekaterinburg and Ksara).

Nov. 11d. 15h. 53m. 40s. Epicentre 35°·5N. 48°·0E.? (as on Nov. 10d.).

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Baku	5·1	17	1 20	+ 1	2 3	−17
Ekaterinburg	23·0	18	5 16	− 1	9 26	+ 1
Irkutsk	42·6	48	—	—	18 3	?SR$_1$

Additional reading : Baku e = +3m.7s. ; all readings have been diminished by 6m.

Nov. 11d. Continuation of values of P at Algiers from epicentre 35°·3N, 3°·5E. (as on Nov. 10d.) :—

h.	m.	s.	h.	m.	s.	h.	m.	s.
1	17	2	2	9	58	15	34	15
1	37	59	8	25	52			

Nov. 11d. Readings also at 4h. (Tacubaya), 10h. (Konigsberg), 11h. (Taihoku), 12h. (Irkutsk), 15h. (Taihoku), 16h. (Irkutsk, near Tacubaya, and near Azores), 18h. (near Athens), 20h. (Ekaterinburg and Irkutsk), 21h. (Baku), 23h. (Irkutsk).

Nov. 12d. 6h. 24m. 10s. Epicentre 5°·0S. 109°·0E.

A = −·324, B = +·942, C = −·087.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	2·4	0 55	+18	1 14	+ 8	—	4·5
Malabar	2·7	0 43	+ 1	1 15	+ 1	—	—
Manila	22·9	e 5 15	+ 1	—	—	—	—

Nov. 12d. 9h. 28m. 20s. Epicentre 35°·5N. 48°·0E. (as on Nov. 10d.).

A = +·545, B = +·605, C = +·581.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Baku	5·1	e 1 21	+ 2	1 2 11	− 9	2·9	4·5
Ekaterinburg	23·0	e 5 7	−10	—	—	9·7	—
Pulkovo	26·8	e 3 22	−154	—	—	—	—

Baku gives also MN = +4·8m.

Nov. 12d. Readings also at 4h. (Apia), 5h. (Algiers), 6h. (Tacubaya, Colombo, Pompeii, and near Batavia and Malabar), 7h. (Ekaterinburg, Azores, Ksara, Colombo), 8h. (near Mizusawa), 16h. (Taihoku), 23h. (Nagasaki).

Nov. 13d. 8h. 32m. 0s. Epicentre 27°·0S. 176°·0W. (as on 1924 April 10d.).

A = −·889, B = −·062, C = −·454 ; D = −·070, E = +·998 ; G = +·453, H = +·032, K = −·891.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Suva	10·3	329	0 48	?	3 0	?	3·7	—
Apia	13·7	18	e 3 21	− 1	7 9	+68	7·5	9·8
Wellington	16·2	206	3 54	− 1	7 2	+ 2	7·9	11·0
Riverview	29·0	248	e 6 8	−10	e 11 6	−11	12·8	23·8
Sydney	29·0	248	6 6	−12	—	—	14·8	16·9
Melbourne	34·4	242	e 13 6	?S	(e 13 6)	+20	—	26·3
Adelaide	39·4	247	e 7 18?	−32	i 14 0	+ 3	e 20·4?	23·5
Honolulu	51·4	23	—	—	16 40	+ 4	—	24·7
Perth	58·6	248	19 36	?	25 42	?	31·4	35·1
Batavia	75·7	272	i 12 47	+54	i 21 30	− 4	e 41·8	—
Berkeley	82·1	40	12 27	− 4	22 55	+ 8	36·9	42·8
Hong Kong	83·6	300	—	—	—	—	—	23·5
Victoria	88·9	32	23 32	?S	(23 32)	−30	43·4	59·1
La Paz	97·7	114	e 14 30	+32	e 26 26	+53	51·2	55·5
Irkutsk	105·1	321	—	—	e 31 0	?	—	—
Chicago	106·5	51	—	—	22 7	?	53·6	—
Ann Arbor	109·4	52	—	—	—	—	e 58·5	65·4
Hyderabad	111·3	278	e 25 23	?[S]	(e 25 23)	[+ 8]	—	—
Rio de Janeiro	112·5	133	—	—	e 28 52	+62	e 53·0	—
Toronto	112·8	51	17 34	[−56]	e 27 23	−29	34·6	—
Ithaca	114·5	53	—	—	—	—	67·0	—
Ottawa	115·8	50	e 22 30	?	e 28 0	−16	58·0	80·0
Bombay	116·8	278	24 18	?	—	—	—	—
Cape Town	117·6	194	—	—	—	—	—	69·1
Harvard E.	118·4	54	—	—	—	—	e 72·4	80·0
Ekaterinburg	130·4	323	19 6	[−13]	—	—	49·0	69·4
Baku	140·1	301	e 23 24	?PR_1	—	—	—	74·4
Konigsberg	149·7	341	e 19 59	[+ 4]	—	—	—	—
Ksara	151·7	292	e 21 58	?	—	—	—	—
Hamburg	153·1	352	20 0?	[0]	—	—	—	—
Granada	168·0	31	—	—	—	—	e 86·5	112·5

Additional readings and notes: Apia iP = +3m.37s., P = +4m.9s., MNV = +19·8m. Wellington L_g = +12·3m. ; T_0 = 8h.31m.55s. Riverview MN = +17·1m., MZ = +24·0m. Sydney L = +23·5m., M = +24·0m. Adelaide ePR_3 = +9m.42s. Honolulu SR_1E = +22m.31s., eE = +24m.33s., SR_2E = +27m.43s. Batavia iE = +22m.10s. Berkeley the P and S given are PZ and SE ; also ePN = +12m.49s., eSZ = +21m.58s., eLN = +37·2m., eLZ = +41·6m. Chicago N = +31m.17s. Ann Arbor eLN = +51·7m. Toronto eE = +29m.8s. Manila gives simply e = 8h.42m. Ottawa eE = +29m.30s., e or eL = +36·0m., MN = +79·0m. Harvard eN = +60m.50s., eE = +65m.12s., LN = +70·3m. Ekaterinburg i = +19m.39s. Baku MN = +85·2m. ; possibly due to following shock. Konigsberg iZ = +20m.4s.

Nov. 13d. 9h. 44m. 0s. Epicentre 40°·0N. 20°·0E. (as on 1923 Oct. 30d.).

A = +·720, B = +·262, C = +·643 ; D = +·342, E = −·940 ; G = +·604, H = +·220, K = −·766.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·6	123	e 0 39	−17	1 11	−28	1·2	1·5
Mostar	3·7	335	i 1 8	+10	i 1 56	+14	—	2·9
Sarajevo	4·1	344	i 1 9	+ 5	i 2 7	+14	—	3·0
Pompeii	4·2	281	e 1 11	+ 6	e 1 46	− 9	2·5	3·0
Belgrade	4·8	4	e 1 16	+ 2	(i 1 55)	−16	—	3·6
Rocca di Papa	5·8	291	e 1 30	0	—	—	3·5	4·5
Florence	7·5	303	1 30	−24	—	—	—	9·0
Venice	7·8	316	5 20	?	—	—	—	7·5
Vienna	8·6	344	e 2 11	+ 1	3 51?	− 2	1 5·6	6·2
Innsbruck	9·6	322	e 2 20	− 4	e 6 48	+150	—	—
Moncalieri	10·3	303	2 6?	−28	5 0	+23	6·1	7·0
Zurich	11·0	316	e 2 56	+12	1 6 53	+119	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	m.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Strasbourg	12·2	318	—	—	e 6 0	+36	e 16·0	8·0
Konigsberg	14·8	1	i 3 35	− 1	—	—	—	9·5
Hamburg	15·2	337	—	—	—	—	e 8·0	11·0
Uccle	15·3	320	—	—	—	—	e 9·0	—
De Bilt	15·8	325	—	—	—	—	e 8·0	9·8
Kew	18·1	316	—	—	—	—	—	26·0
Kucino	19·3	32	e 4 24	− 9	—	—	10·1	12·2
Upsala	19·9	356	—	—	—	—	e 11·0	13·4
Pulkovo	20·8	15	3 38	−73	e 7 30	−70	8·5	14·5
San Fernando	20·8	269	(5 0)	+ 9	—	—	19·0	34·0
Eskdalemuir	21·7	322	(5 0?)	− 1	—	—	—	—
Baku	22·7	79	—	—	—	—	—	23·9
Ekaterinburg	31·1	44	6 8	−31	—	—	—	9·2

Additional readings and notes: Athens iPE = +0m.45s., MN = +2·2m. Mostar S is given as iP; iS = +2m.40s. Belgrade S is given as iP; iSR_1 = +3m.5s. Rocca di Papa ePE = +1m.31s., ePE = +1m.39s., N = +3m.39s. Venice MN = +8·5m. Vienna PR_1? = +2m.53s. Moncalieri MN = +7·6m. Konigsberg MN = +10·7m. De Bilt eLN = +7·0m. Kucino readings have been increased by 5m. Upsala MN = +14·2m. San Fernando P given as SR (?). Eskdalemuir reading has been increased by 9m.

Nov. 13d. Readings also at 6h. (near Berkeley and Lick and near Manila), 8h. (Batavia and near Malabar), 12h. (Tacubaya, Riverview, and Wellington), 13h. (Riverview and Wellington), 16h. (Nagasaki), 17h. (Barcelona), 18h. (La Paz), 20h. (Sinj), 23h. (Zurich).

Nov. 14d. Readings at 6h. (Kobe and Riverview), 10h. (Batavia (2)), 14h. (Port au Prince and close to Tacubaya), 17h. (near Calcutta and Bombay), 21h. (La Paz).

Nov. 15d. Readings at 1h. (Ottawa), 4h. (La Paz), 5h. (Strasbourg), 7h. (Algiers), 10h. (2) and 11h. (2) (Tacubaya), 12h. (La Paz, Perth, Riverview, and Ekaterinburg), 18h. (Ekaterinburg, Eskdalemuir, and De Bilt), 22h. (Ksara), 23h. (De Bilt).

Nov. 16d. 23h. 14m. 30s. Epicentre 17°·5N. 47°·5W. (as on 1924 Sept. 4d.).

A = +·644, B = −·703, C = +·301; D = −·737, E = −·676:
G = +·203, H = −·222, K = −·954.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ottawa	36·4	327	—	—	e 16 0	?SR_1	e 24·0	—
Toronto N.	37·4	322	—	—	17 0	?SR_1	24·9	—
La Paz	39·6	212	7 50	− 1	1 14 8	+ 8	22·2	24·7
Eskdalemuir	50·5	31	—	—	e 17 30	+65	—	—
Edinburgh	50·8	30	—	—	—	—	e 29·5	—
Uccle	52·7	40	—	—	—	—	e 26·5	—
De Bilt	53·6	39	—	—	—	—	e 26·5	—
Strasbourg	54·2	42	—	—	—	—	25·5	—
Baku	84·1	49	e 12 25	−18	e 23 29	+20	40·5	42·9
Ekaterinburg	84·8	31	—	—	e 28 33	?SR_1	37·5	—

Additional readings and notes: Ottawa eN = +17m.38s. La Paz T_e = 23h.14m.17s. De Bilt eLN = +27·5m. Baku e_2 = +12m.29s., PR_1 = +16m.15s., MN = +50·2m.

Nov. 16d. Readings also at 1h. (near Batavia, Malabar, and Ekaterinburg), 10h. (Apia (2)), 12h. (Wellington and Riverview), 14h. (Ekaterinburg and Irkutsk), 15h. (Ekaterinburg and Algiers), 20h. (Ekaterinburg and La Paz), 23h. (Riverview).

Nov. 17d. Readings also at 10h. (Ekaterinburg), 18h. (Amboina).

Nov. 18d. 11h. 39m. 0s. Epicentre 2°·0S. 128°·5E. (as on 1921 May 20d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	1·7	188	i 0 42	+16	—	—	—	—
Manila	18·2	336	e 5 30	+71	—	—	8·9	—
Malabar	21·5	255	i 5 0	+ 1	i 8 51	− 4	—	—
Batavia	22·0	258	i 6 6	+61	—	—	—	—
Perth	32·2	200	—	—	e 11 30	−41	—	—
Sydney	38·2	148	17 0	?SR_1	—	—	—	19·5
Riverview	38·2	148	e 14 12	?S	(e 14 12)	+31	—	18·0
Irkutsk	58·0	344	e 11 16	+77	i 18 37	+38	—	—
Ekaterinburg	79·8	330	12 18	0	22 22	+ 1	—	—
Baku	82·7	311	—	—	e 22 55	+ 1	e 44·9	—

Additional readings and notes: Amboina reading has been increased by 4 min. Malabar readings are given as i_1 and i_2. Irkutsk readings are given as e and i_1, with $i_2 = +19$m.43s. Ekaterinburg e = +23m.4s. Baku e = +23m.7s. and +24m.54s.

Nov. 18d. 12h. 5m. 0s. Epicentre 2°·0S. 128°·5E. (as at 11h.).

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	18·2	336	e 5 28	+69	—	—	9·4	—
Perth	32·2	200	13 22	?S	(13 22)	+71	17·0	21·9
Sydney	38·2	148	9 36	+116	—	—	17·5	18·3
Riverview	38·2	148	—	—	e 13 18	−23	—	17·7
Melbourne	38·8	159	—	—	—	—	—	19·8
Irkutsk	58·0	344	10 4	+ 5	18 20	+21	30·0	—
Ekaterinburg	79·8	330	12 10	− 8	22 28	+ 7	38·0	—
Baku	82·7	311	10 24	−130	e 23 43	+49	42·9	58·8
La Paz	155·2	139	20 3	[+ 1]	—	—	—	—

Additional readings and notes: Perth S = +15m.31s., SR_1?, L = +19·1m. and 21·5m. Riverview eS? = +16m.6s., MN = +20·7m. Baku: The two shocks are recorded as one, e_1, e_2, e_3 belonging to the first and e_4 being P? (as above) for the second, MN = +54·8m.

Nov. 18d. Readings also at 0h. (Tacubaya), 3h. (Riverview, Sydney, and Wellington), 8h. (Ekaterinburg), 9h. (Irkutsk), 10h. (Batavia), 16h. (Algiers), 17h. (La Paz), 20h. (near Amboina).

Nov. 19d. Readings at 1h. (Ekaterinburg and near Manila), 4h. (Nagoya), 7h. (Athens, Baku, and Ksara), 8h. (near Athens), 10h. (Algiers, Baku, and Ksara), 15h. (Riverview), 16h. (Baku and Wellington), 17h. (Besançon and Zurich), 18h. (Nagasaki and Zurich), 20h. (Stonyhurst), 23h. (Baku and Ksara).

1924. Nov. 20d. 20h. 27m. 38s. Epicentre 39°·0N. 31°·0E.

A = +·666, B = +·400, C = +·629 ; D = +·515, E = −·857 ;
G = +·539, H = +·324, K = −·777.

The position for the epicentre was given by Athens. An independent computation, using most of the material, gave 39°·1N. 31°·2E. It seemed needless refinement to alter the Athens figures.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	5·8	261	i 1 42	+12	i 2 53	+14	3·1	4·2
Ksara	6·5	141	1 35	− 4	3 5	+ 8	—	4·5
Helwan	9·1	178	2 15	− 3	3 45	−21	—	9·1
Belgrade	9·8	310	i 2 29	+ 2	—	—	—	6·2
Sarajevo	10·6	301	e 3 7	+29	6 4	+79	6·5	9·0
Mostar	10·8	298	e 3 6	+25	e 5 56	+66	—	—
Lemberg	11·9	337	e 2 52	− 6	e 6 52	+95	—	9·4
Budapest	12·2	318	e 3 22?	+20	5 40	+16	—	9·6
Pompeii	12·7	283	e 3 13	+ 4	e 7 48	+131	—	9·4
Vienna	14·1	316	e 3 27	0	6 15	+ 5	—	10·4
Rocca di Papa	14·2	286	e 3 30	+ 1	—	—	e 7·0	8·8
Baku	14·5	79	i 3 41	+ 8	i 6 38	+18	7·4	9·7
Venice	15·2	301	e 3 42	0	i 8 52	+135	—	11·9
Florence	15·5	294	3 52	+ 6	7 7	+23	—	8·9
Innsbruck	16·5	306	3 56	− 3	5 22	−105	e 9·4	19·9
Konigsberg	17·3	339	4 12	+ 3	7 37	+12	e 10·4	13·4
Moncalieri	18·2	297	i 4 9	−10	7 28	−16	9·7	13·8
Zurich	18·3	304	e 4 22	+ 1	e 7 52	+ 5	—	—
Strasbourg	19·3	307	4 34	+ 1	8 15	+ 7	10·1	13·0
Besançon	19·9	303	4 42	+ 2	8 39	+18	11·4	12·4
Hamburg	20·4	323	e 4 48	+ 2	i 8 41	+ 9	—	12·4
Pulkovo	20·7	359	i 4 52	+ 3	8 46	+ 8	10·9	15·6
Uccle	22·1	311	5 3	− 3	i 9 8	+ 1	11·2	15·2
Algiers	22·1	272	e 4 37	−29	e 9 2	− 5	11·9	—
Barcelona	22·1	286	i 4 59	− 7	—	—	—	—
De Bilt	22·1	315	5 6	0	9 13	+ 6	10·4	16·0
Upsala	22·6	342	i 5 10	− 2	i 9 21	+ 4	—	14·8
Paris	22·6	305	i 5 7	− 5	i 9 13	− 4	10·4	16·4
Tortosa	23·3	284	i 5 16	− 4	9 35	+ 4	10·9	14·4
Kew	25·0	310	—	—	(10 22)	+19	—	10·4
Oxford	25·7	313	i 5 40	− 5	i 10 22	+ 6	—	17·6
West Bromwich	26·3	313	5 42	− 9	10 19	− 9	—	—
Almeria	26·3	276	i 5 36	−15	i 10 29	+ 1	14·9	16·6
Bergen	26·7	331	e 3 22?	?	—	—	—	—
Toledo	26·9	283	i 5 48	− 9	e 10 34	− 5	e 13·0	16·1
Stonyhurst	27·1	314	i 5 51	− 8	10 32	−11	—	22·2
Granada	27·2	277	i 5 49	−11	i 10 49	+ 4	e 14·3	19·2
Bidston	27·3	313	—	—	—	—	—	19·9
Malaga	27·9	277	5 54	−13	10 54	− 3	12·2	16·6
Eskdalemuir	28·0	317	2 22?	?	—	—	—	—
Dyce	28·1	321	i 6 12	+ 3	10 52	− 9	—	20·7
Edinburgh	28·2	318	6 2	− 8	10 48	−15	—	20·5
San Fernando	29·3	277	6 18	− 3	i 11 25	+ 3	14·4	17·4
Lisbon	31·0	282	e 9 47	+189	17 47	+356	—	—
Simla	38·2	87	e 16 16	?SR_1	—	—	—	—
Bombay	41·3	107	e 8 22	+17	—	—	—	—
Hyderabad	46·4	105	8 15	−28	15 3	−30	—	—
Irkutsk	50·6	50	i 9 9	− 2	16 32	+ 6	26·4	—
Colombo	54·3	115	7 47	−108	16 47	−26	33·4	35·7
Ottawa	73·1	316	11 39	+ 2	21 15	+12	e 44·9	—
Cape Town	73·8	191	—	—	—	—	—	42·2
Fordham	74·7	312	—	—	e 20 31	−51	e 36·4	37·7
Toronto	76·2	316	—	—	21 5	−34	30·3	—
Ann Arbor	79·4	317	11 22	−53	19 40	−156	31·1	47·9
Manila	80·8	80	e 13 17	+53	—	—	—	—
Chicago	81·8	318	—	—	18 11	?	33·3	—
La Paz	107·3	263	e 34 26	?SR_1	—	—	61·4	66·5
Riverview	132·4	103	—	—	—	—	e 76·9	—

Additional readings: Athens MN = +3·4m. Belgrade: See next page. Lemberg MN = +9·6m. Budapest MN = +9·4m. Vienna iPZ = +3m.33s., PR_1? = +3m.40s., i = +4m.17s., iZ = +4m.27s., iE = +4m.35s., i = +5m.11s., iE = +5m.30s., SR_1? = +7m.14s., iE = +7m.45s., iE = +9m.26s., iN = +10m.13s. Rocca di Papa PN = 3m.43s., eLN = +8·1m.

Continued on next page.

Baku MZ = +10·6m. Venice MN = +12·0m. Konigsberg PE = +4m.19s., MN = +11·9m. Moncalieri MN = +11·6m. Hamburg MZ = +14·7m. Pulkovo MZ = +14·4m. Belgrade i = +2m.47s., PR_1E = +3m.15s., PR_1N = +3m.24s., PR_2E = +3m.56s., PR_2N = +4m.7s., PR_3N = +4m.49s., iSR_1 = +5m.9s., MN = +6·5m. Uccle iP = +5m.5s., MN = +13·6m. De Bilt iZ = +5m.7s., MN = +13·1m. Upsala MN = +16·3m. Paris MN = +12·4m. Oxford i = +8m.8s. Toledo iNW = +10m.46s., iNE = +10m.48s., SR_1NE = +11m.9s. Granada i = +6m.26s., i = +6m.39s., iSZ = +10m.47s., MN = +15·3m., MZ = +17·3m. Dyce P? = +3m.49s., S = +9m.29s. San Fernando MN = +18·4m. Tortosa PN = +5m.12s. Irkutsk PR_1 = +11m.8s., PR_2 = +12m.8s., iSR_1 = +20m.25s. Ottawa e = +25m.52s., e = +29m.22s. Toronto SN = +21m.1s., eE = +21m.45s., e = +26m.53s. Ann Arbor PR_2 = +15m.10s., SR_1? = +24m.34s.

Nov. 20d. Readings also at 0h. (Ksara), 1h. (Amboina), 9h. (Apia), 12h. (Batavia and Malaga), 13h. (Malaga (3)), 19h. (Manila), 21h. (Amboina).

Nov. 21d. Readings at 0h. (Tortosa), 11h. (Tacubaya), 18h. (Baku), 19h. (Algiers), 20h. (Kodaikanal).

Nov. 22d. Readings at 4h. (Nagasaki), 5h. (Agana), 13h. (Algiers), 17h. (Kobe), 21h. (Perth), 23h. (Batavia and Malabar).

Nov. 23d. Readings at 0h. (La Paz), 1h. (Kobe and Tacubaya), 4h. (Mostar), 5h. (La Paz), 11h. (Tacubaya), 13h. (Tacubaya), 15h. (Manila), 17h. (La Paz), 21h. (Athens and Taihoku), 23h. (Nagoya, Osaka, and Kobe).

Nov. 24d. 7h. 58m. 48s. Epicentre 7°·4S. 110°·0E. (Wonosobo).

$A = -\cdot339$, $B = +\cdot932$, $C = -\cdot129$; $D = +\cdot940$, $E = +\cdot342$; $G = +\cdot044$, $H = -\cdot121$, $K = -\cdot992$.

Wonosobo was destroyed by the shock. [See pictures in *The Times* of 1924 Dec. 30d.]

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Malabar	2·4	274	i 1 7	+30	1 16	+10	—	—
Batavia	3·3	290	i 1 3	+11	i 1 24	− 7	—	—
Perth	25·1	168	—	—	e 10 47	+42	—	—
Kodaikanal	36·9	297	18 54	?L	—	—	(18·9)	—
Adelaide	38·1	140	—	—	—	—	e 25·6	31·2
Hyderabad	39·9	310	e 13 16	?S	(e 13 16)	−49	—	24·6
Melbourne	43·8	140	—	—	—	—	—	30·8
Bombay	45·1	307	8 12	−22	—	—	—	—
Riverview	46·2	133	—	—	—	—	e 30·6	32·9
Sydney	46·2	133	—	—	29 24	?	31·2	34·2
Baku	73·0	317	i 11 50	+14	i 21 34	+32	36·6	45·7
Ekaterinburg	75·8	335	i 11 54	0	e 21 20	−15	32·7	—
Pulkovo	91·3	330	e 11 37	−106	i 24 13	−14	—	—
De Bilt	104·9	323	—	—	—	—	e 65·2	—

Additional readings and notes: Malabar readings have been diminished by 6m. Batavia iP = +1m.6s. Riverview MN = +31·0m. Baku PS = +22m.20s., MN = +45·9m., MZ = +48·5m.

Nov. 24d. Readings also at 5h. (near Tacubaya), 6h. (near Mostar), 7h. (near Batavia and Malabar), 12h. (near Malabar), 14h. (near Mizusawa), 15h. (Baku, Agana, Ksara, Ekaterinburg, and near La Paz), 17h. (Pulkovo), 18h. (near Athens), 20h. (Baku and Ekaterinburg), 23h. (near Mizusawa).

Nov. 25d. 17h. 26m. 40s. Epicentre 45°·0N. 138°·0E.

A = −·526, B = +·473, C = +·707 ; D = +·669, E = +·743 ;
G = −·526, H = +·473, K = −·707.

There is some suggestion (in the negative residuals for large values of Δ) of deep focus, but scarcely enought to justify serious treatment.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sapporo	3·1	128	1 8	+19	—	—	1·6	1·7
Ootomari	3·7	62	0 58	0	—	—	1·5	1·5
Mizusawa	6·3	158	1 48	+12	2 59	+ 7	—	—
Nagoya	9·8	183	2 51	+24	—	—	4·7	5·9
Kobe	10·5	193	2 57	+20	4 17	−26	5·2	5·3
Osaka	10·6	192	2 57	+19	—	—	5·2	5·9
Nagasaki	13·8	210	3 49	+26	—	—	6·7	6·8
Zi-ka-wei	18·9	229	i 4 38	+10	e 8 20	+20	—	10·8
Irkutsk	23·2	300	5 11	− 8	9 16	−13	15·3	—
Taihoku	24·0	219	e 5 44	+16	—	—	—	—
Hong Kong	29·9	229	—	—	—	—	—	13·8
Ekaterinburg	47·4	314	i 9 12	+22	i 15 52	+ 6	24·3	30·9
Hyderabad	56·4	261	9 39	− 9	17 25	−14	—	—
Bombay	59·4	266	12 27	?PR_1	i 18 4	−12	—	—
Baku	61·7	300	i 10 15	− 8	18 41	− 3	25·8	—
Vienna	73·7	324	11 21	−19	20 30	−40	—	—
Eskdalemuir	74·4	338	—	—	e 20 31	−48	—	—
De Bilt	74·8	332	—	—	e 21 10	−14	—	—
Uccle	76·2	332	—	—	e 20 50	−49	—	—
La Paz	144·1	46	22 23	?PR_1	—	—	—	—

Additional readings and notes: Mizusawa SN = +2m.58s. Osaka MN = +6·0m. Irkutsk gives a second P and S just a minute later. Ekaterinburg i_1 = +17m.50s., i_2 = +18m.28s., i_3 = +21m.35s. Vienna i = +12m.34s. Eskdalemuir e = +22m.50s. De Bilt e = +20m.39s.

Nov. 25d. Readings also at 2h. (Hokoto), 4h. (Johannesburg), 7h. (Amboina), 10h. (Taihoku), 16h. (La Paz and Kingston), 18h. (Strasbourg), 23h. (La Paz).

Nov. 26d. 6h. 50m. 35s. Epicentre 2°·0N. 20°·5W. (as on 1921 Dec. 21d.).

A = +·936, B = −·350, C = +·035 ; D = −·350, E = −·937 :
G = +·033, H = −·012, K = −·999.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Rio de Janeiro	33·3	220	e 7 10	+11	—	—	e 16·7	—
La Paz	50·5	246	i 9 8	− 2	i 16 27	+ 2	28·4	34·1
Strasbourg	52·5	24	—	—	—	—	—	49·4
Baku	73·9	49	—	—	e 19 40	−93	—	—
Ekaterinburg	83·5	34	i 12 30	− 9	—	—	61·4	—

Baku gives also e = +19m.47s.

Nov. 26d. Readings also at 0h. (Apia (2), Baku, and Tacubaya), 1h. (La Paz), 9h. (Manila), 10h. (Apia), 14h. (Mizusawa), 21h. (Apia).

Nov. 27d. Readings at 0h. (Perth), 1h (near Kobe), 9h. (near Athens), 15h. (2), 16h., 17h., and 19h. (Irkutsk), 21h. (near Kesra), 22h. (Baku, Ekaterinburg and Irkutsk).

Nov. 28d. 12h. 9m. 35s. (I) } 12h. 36m. 20s. (II) } Epicentre 55°·0N. 176°·0E. 19h. 2m. 15s. (III) }

A = −·572, B = +·040, C = +·819; D = +·070, E = +·998; G = −·817, H = +·057, K = −·574.

Very uncertain.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
II	Victoria	37·0	75	(11 54)	+264	(15 0)	+96	15·0	33·4
III	E.	37·0	75	11 50	+260	(16 13)	+169	16·3	19·4
II	Honolulu	38·9	140	—	—	e 14 23	+32	e 16·8	17·1
III		38·9	140	—	—	14 25	+34	—	16·8
I	Irkutsk	40·7	297	e 8 0	− 1	e 14 8	− 9	18·4	26·6
II		40·7	297	e 7 57	− 4	—	—	19·7	26·7
III		40·7	297	e 8 2	+ 1	e 14 28	+11	19·3	26·6
I	Zi-ka-wei	44·9	260	8 17	−15	—	—	—	57·8
III		44·9	260	8 18	−14	e 15 3	−11	—	28·3
I	Ekaterinburg	56·5	325	i 10 37	+48	19 17	+97	29·4	38·5
II		56·5	325	10 38	+49	—	—	32·7	38·7
III		56·5	325	10 38	+49	19 4	+84	27·8	38·5
I	Chicago	60·1	60	—	—	18 38	+14	33·1	—
II		60·1	60	—	—	14 46	?PR_1	33·4	—
III		60·1	60	—	—	19 15	+51	32·9	—
II	Pulkovo	62·1	341	—	—	—	—	e 33·7	—
III		62·1	341	—	—	—	—	23·8	45·8
II	Toronto	62·5	53	—	—	28 3	?	36·4	44·4
III		62·5	53	—	—	—	—	35·8	36·6
I	Ottawa	62·8	49	e 18 25	?S	(e 18 25)	−33	39·4	—
II		62·8	49	—	—	—	—	39·7	—
III	Upsala	64·1	349	—	—	—	—	e 48·8	—
I	Harvard E.	67·2	48	—	—	—	—	e 41·9	—
II	N.	67·2	48	—	—	—	—	e 41·9	—
II	Georgetown	67·4	55	17 24	?S	(17 24)	?	37·1	—
II	Eskdalemuir	69·7	359	—	—	23 40?	?	—	—
III		69·7	359	—	—	27 45?	?	—	—
I	De Bilt	72·6	354	—	—	16 25	?PR_1	—	—
III		72·6	354	—	—	—	—	e 42·8	—
III	Kew	73·5	358	—	—	—	—	—	57·7
I	Baku	74·2	320	i 11 45	+ 2	22 4	+48	37·4	45·7
II		74·2	320	i 11 46	+ 3	—	—	—	52·9
III		74·2	320	i 11 48	+ 5	e 21 52	+36	42·8	43·9
II	Strasbourg	76·0	352	—	—	—	—	43·7	—
III		76·0	352	—	—	—	—	47·8	—
III	Moncalieri	79·5	352	e 36 56	?L	45 29	?	58·6	—
II	Hyderabad	80·0	285	22 41	?S	(22 41)	+18	—	55·0
III		80·0	285	22 43	?S	(22 43)	+20	—	55·1
I	Bombay	81·8	292	—	—	19 25	?	—	—
III		81·8	292	12 46	+17	23 20	+36	45·1	48·8
III	Granada	87·8	0	—	—	—	—	e 62·7	—

Additional readings and notes: Victoria II P is given as LE and S as LN, MN = +21·5m. III P is given at 18h., S is given as LE, LN = +13·6m., MN = +·21·9m. Honolulu II eN = +17m.0s., MN = +17·9m., III eN = +14m.8s., MN = +18·3m. Irkutsk I MZ = +30·7m., II MZ = +30·7m. Zi-ka-wei readings have been increased by 1h. Ekaterinburg I MZ = +42·7m., II MZ = +40·8m., III i = +10m.40s., MZ = +40·5m. Pulkovo III MZ = +46·0m. Toronto II eN = +27m.53s. Georgetown II P is given as L, LN = +41·0m. Baku I ePR_3 = +18m.11s., II MZ = +52·9m., III MZ = +52·8m., MN = +52·9m.

Nov. 28d. 21h. (50m.). A number of stations give readings, usually to minutes only, as below. As two of the stations are in N. America, the epicentre may be in the Atlantic; though there may have been two shocks, one on each side of the Atlantic.

Station.	Phase.	Time. h. m.	Station.	Phase.	Time. h. m.
Eskdalemuir	L	21 59	Strasbourg	—	22 0
Edinburgh	M	22 0	Hamburg	e	22 5
Stonyhurst	—	21 59	Paris	eL	22 4
Oxford	L	22 0·8	„	M	22 5·0
„	M	22 2·2	Moncalieri	eL	22 4·4
Kew	M	22 3	Granada	L	22 4·2
De Bilt	eLE	22 2	„	M	22 6·0
„	eLNZ	22 3	Ekaterinburg	L	22 11
„	M	22 5	Ottawa	eN	22 3
Uccle	eL	22 2	„	eLN	22 6·5
Toronto	LN	22 8·4	Ann Arbor	eL	22 4·0

Nov. 28d. 22h. 57m. 10s. Epicentre 37°·2N. 3°·6W (as on 1924 Oct. 18d.).

A = +·795, B = −·050, C = +·605.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Granada	0·0	—	i 0 7	+ 7	i 0 12	+12	0·2	0·3
Malaga	0·8	234	0 6	− 6	0 14	− 8	0·3	0·3
Almeria	1·2	111	i 0 20	+ 2	i 0 29	− 4	e 1·6	—

Nov. 28d. Readings also at 0h. (Melbourne, Riverview, La Paz, and Baku), 1h. (near Osaka and Nagoya), 5h. (Apia), 8h. (Riverview), 9h. (Rocca di Papa, Moncalieri, Pompeii, and Tacubaya), 11h. (Zi-ka-wei), 13h. (Manila and near Tacubaya), 16h. (Baku), 18h. (Zi-ka-wei), 19h. (near Mizusawa).

Nov. 29d. Readings at 4h. (Baku and Ksara), 6h. (Apia), 11h. (Baku).

Nov. 30d. Readings at 1h. (near Osaka (2) and Ekaterinburg), 3h. (Ekaterinburg), 6h. (Ekaterinburg), 17h. (La Plata), 19h. (Batavia), 20h. (Baku and Ksara, possibly as on Nov. 29d.), 21h. (Irkutsk).

In addition to the Algiers repetitions quoted up to 11d. the following taken from the notes to subsequent days are probably also repetitions from 35°·3N. 3°·5E.

d.	h.	m.	s.	d.	h.	m.	s.
12	5	35	47	19	10	47	26
16	15	57	16	21	19	19	51
18	16	25	40	22	13	35	41

Dec. 1d. 6d. 2m. 18s. Epicentre 7°·0N. 126°·0E. (as on 1924 Oct. 27d.).

A = −·583, B = +·803, C = +·122 ; D = +·809, E = +·588 ;
G = −·072, H = +·099, K = −·993.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	9·0	327	e 4 44	?L	—	—	(e 4·7)	—
Hong Kong	19·1	325	—	—	—	—	—	11·2
Batavia E.	23·2	236	i 5 41	+22	—	—	—	—
Zi-ka-wei	24·6	350	e 5 35	+ 1	e 9 50	− 5	—	—
Perth	40·1	194	—	—	e 14 15	+ 7	—	—
Bombay	52·9	289	12 42?	?PR_1	—	—	—	—
Ekaterinburg	70·8	329	e 12 15	+53	i 21 24	+48	34·7	51·8
Baku	74·9	311	—	—	e 22 12	+47	36·6	39·1
Kucino	83·1	325	—	—	—	—	e 44·7	—
Pulkovo	86·8	330	13 5	+ 7	23 33	− 6	41·7	—
De Bilt	102·5	327	—	—	—	—	e 55·7	—

Additional readings and notes: Ekaterinburg MN = +41·1m. ; all readings having been diminished by 1h. Baku MN = +37·0m.

Dec. 1d. 22h. 56m. 48s. Epicentre 12°·0S. 177°·0W.

A = −·977, B = −·051, C = −·208 ; D = −·052, E = +·999 ;
G = +·208, H = +·011, K = −·978.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	5·4	110	e 1 3	−20	—	—	—	2·0
Riverview	36·3	227	e 7 16	− 8	(e 13 24)	+10	e 13·4	17·1
Perth	64·4	240	—	—	i 19 1	−17	27·3	—
Batavia	75·2	268	i 11 53	+ 3	e 21 30	+ 2	—	—
La Paz	104·1	111	24 19	?[S]	(24 19)	[−24]	52·0	—
Hyderabad	107·2	285	19 12	?PR_1	—	—	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Pulkovo	128·1	342	e 21 43	?PR_1	—	—	—	—
Kucino	128·5	335	i 23 0	?PR_1	e 28 24	−87	—	—
Baku	130·1	313	e 21 49	?PR_1	—	—	64·2	—
De Bilt	139·9	357	i 19 34	[− 5]	e 41 33	?SR_1	—	—
Uccle	141·2	359	e 19 36	[− 5]	e 41 42	?SR_1	e 47·2	—
Vienna	142·1	345	e 19 40	[− 3]	i 24 7	?PR_1	—	—
Ksara E.	142·9	311	19 47	[+ 2]	20 33	?	—	—
Strasbourg	143·2	354	e 19 38	[− 7]	20 17	?	—	—
Innsbruck	144·0	350	e 19 37	[−10]	—	—	—	—
Rocca di Papa	149·1	345	19 54	[0]	—	—	—	—

Additional readings: Riverview MN = +16·2m. Perth i = +20m.3s. and +21m.26s. Batavia e = +7m.29s., i = +21m.34s. Pulkovo i = +22m.29s. and +23m.47s. Kucino e = +23m.36s. Baku e = +22m.13s., L = +33·2m. Uccle i = +20m.13s. Vienna iPZ = +19m.44s., iZ = +20m.19s., iE = +20m.26s. and 24m.7s. Strasbourg iP? = +19m.44s., S = +20m.26s., LM = +20m.38s. Innsbruck iNE = +20m.42s.

Dec. 1d. Readings also at 1h. (Ekaterinburg and Baku), 3h. (Apia), 5h. (Batavia), 10h. (Apia), 12h. (near Athens), 14h. (near Batavia and Malabar), 16h. (Riverview, Perth, and near Wellington), 22h. (near Victoria).

Dec. 2d. Readings at 0h. (Ekaterinburg and near Mizusawa), 1h. (La Paz and near Batavia and Malabar), 2h. (Melbourne), 3h. (Manila), 6h. (La Paz), 8h. (Mizusawa), 9h. (Ekaterinburg), 10h. (Apia), 13h. (Algiers and Florence), 14h. (near Mizusawa), 22h. (near Manila), 23h. (Algiers).

Dec. 3d. 21h. 34m. 45s. Epicentre 45°·0N. 16°·0E. (as on 1924 Jan. 29d.).

A = +·680, B = +·195, C = +·707 ; D = +·276, E = −·961 ; G = +·679, H = +·195, K = −·707.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Laibach	1·5	315	i 0 36	+13	i 0 50	+ 8	—	1·1
Sarajevo	2·1	123	e 1 4	?S	(e 1 4)	+ 6	—	1·8
Venice	2·6	280	1 6	?S	(1 6)	− 6	—	1·7
Belgrade	3·2	93	i 1 26	?S	(i 1 26)	− 2	—	—
Vienna	3·3	4	e 0 42	−10	1 25	− 6	—	1·5
Budapest	3·3	40	0 54	+ 2	1 27	− 4	—	—
Innsbruck N.W.	3·9	305	e 0 48	−13	i 1 36	−11	—	—
Zurich	5·6	298	e 1 21	− 6	i 2 47	+13	—	—
Strasbourg	6·7	305	e 1 45	+ 3	e 2 54	− 8	(3·4)	3·6
Hamburg	9·4	338	—	—	—	—	e 4·6	—
Uccle	9·7	311	—	—	—	—	e 5·0	—
De Bilt	10·1	319	—	—	—	—	e 5·4	—
Pulkovo	17·1	25	e 3 52	−14	—	—	e 10·8	—
Ekaterinburg	29·9	51	—	—	—	—	17·2	—

Additional readings: Laibach i = +47s. Sarajevo P = +1m.23s., S = +1m.48s. Venice MN = +2·8m. Belgrade i = +2m.5s., iS = +2m.24s. Vienna iPZ = +44s., iP = +50s., PR_1 = +1m.13s., PR_2 = +1m.17s., MZ = +1·9m. Strasbourg e = +2m.34s. and +2m.54s. (entered as S), L is given as S.

Dec. 3d. Readings also at 2h. and 3h. (Algiers), 4h. and 7h. (Nagasaki), 8h. (Riverview), 9h. (Ottawa), 12h. (Apia and near Algiers (3)), 13h. (La Paz), 14h. (Ekaterinburg (2)), 20h. (Baku), 23h. (Perth and near Tacubaya).

Dec. 4d. Readings at 6h. (Apia), 10h. (Venice and near Laibach), 17h. (Apia), 18h. (Irkutsk), 23h. (Nagoya, near Osaka, and Mizusawa).

Dec. 5d. 9h. 36m. 12s. Epicentre 3°·0N. 125°·0E.

$A = -\cdot573$, $B = +\cdot818$, $C = +\cdot052$; $D = +\cdot819$, $E = +\cdot574$; $G = -\cdot030$, $H = +\cdot043$, $K = -\cdot999$.

The determination is rough, but on the whole better than if the epicentre 2°·1N. 127°·8E. were adopted (as on 1922 Oct. 5d. and previous dates), though there is something queer about the Australian readings.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	7·4	155	0 36	−76	1 30	−111	—	—
Manila	12·3	341	i 3 34	+31	—	—	i 6·2	6·4
Malabar	20·2	239	i 4 48	+ 5	i 8 31	+ 4	—	—
Batavia	20·3	243	i 4 50	+ 5	i 8 23	− 6	—	—
Hong Kong	22·0	332	5 17	+12	(9 20)	+15	9·3	10·0
Taihoku	22·3	352	e 5 16	+ 7	(9 23)	+12	9·4	—
Osaka	33·2	17	6 41	−17	(12 5)	−22	12·1	16·0
Nagoya	34·0	19	6 54	− 9	—	—	—	—
Perth	36·0	193	8 0	+38	i 11 58	−72	15·0	—
Adelaide	40·0	165	—	—	e 11 36	?	e 15·4?	23·0
Calcutta E.	40·6	303	7 40	−20	—	—	—	—
Riverview	44·3	149	e 7 21	−67	e 13 29	−97	16·9	27·6
Melbourne	44·8	159	e 13 30	?S	(e 13 30)	−102	25·8	26·8
Colombo	45·1	277	13 38	?S	(13 38)	−98	—	19·9
Kodaikanal	47·8	281	19 48	?L	—	—	(19·8)	—
Hyderabad	47·9	290	9 1	+ 8	16 21	+28	—	—
Irkutsk	52·2	345	i 9 19	− 2	i 16 40	− 6	23·8	—
Bombay	53·4	291	9 29	0	17 3	+ 2	—	—
Ekaterinburg	73·7	330	i 12 12	+32	i 21 36	+26	34·8	—
Baku	76·8	312	i 11 56	− 4	i 21 43	− 4	33·8	41·8
Kucino	85·9	326	e 12 39	−14	i 23 4	−25	e 25·6	—
Ksara F.	87·6	304	e 13 2	− 1	24 23	+35	—	—
Pulkovo	89·8	331	12 57	−18	e 23 37	[+10]	—	—
La Paz	161·3	137	i 19 57	[−12]	32 58	?	—	—

Additional readings: Batavia i = +8m.47s. Osaka MN = +14·7m. Perth PS = +11m.5s. Calcutta PN = +7m.45s. Riverview eSR_1 = +16m.44s., MN = +29·4m. Ekaterinburg i = +15m.12s. and +26m.50s. Baku i = +11m.59s., PR_1 = +15m.4s., MN = +44·6m. Kucino i = +24m.12s. Ksara S has been increased by 10m.

Dec. 5d. Readings also at 0h. (near Apia), 4h. (Osaka), 5h. (Ekaterinburg), 7h. (Kobe), 9h. (near Athens), 10h. (Kodaikanal and near Manila), 16h. (Algiers), 17h. (near Ksara).

Dec. 6d. Readings at 0h. (Sarajevo), 4h. (Batavia and Manila), 5h. (Pulkovo, Riverview, and Baku), 6h. (Apia, Baku (2), and Ksara), 7d. (near Tacubaya), 10h., 11h., and 14h. (Apia), 15h. (Calcutta), 19h. (Ekaterinburg), 20h. (Apia), 21h. (near Tacubaya).

Dec. 7d. 15h. 43m. 15s. Epicentre 46°·5N. 28°·3W. (as on 1924 Sept. 28d.).

$A = +\cdot606$, $B = -\cdot326$, $C = +\cdot725$; $D = -\cdot474$, $E = -\cdot880$; $G = +\cdot639$, $H = -\cdot344$, $K = -\cdot688$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Edinburgh	18·2	50	—	—	—	—	10·8	—
Oxford	18·3	63	—	—	—	—	8·7	12·2
Toledo	18·8	102	e 4 8	−19	(e 7 0)	−58	e 7·0	9·4
San Fernando	19·3	114	4 33	0	—	—	9·8	10·8
Granada	20·5	108	i 4 26	−21	e 8 33	− 1	10·0	11·1
Paris	20·7	72	—	—	e 7 45	−53	—	—
Uccle	21·8	67	e 4 59	− 4	e 9 15	+14	e 11·2	12·8

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
De Bilt	22·3	63	e 5 14	+ 5	e 9 27	+16	e 11·8	13·6
Strasbourg	24·2	72	e 5 21	− 9	—	—	e 12·8	—
Hamburg	25·2	60	e 5 45?	+ 5	—	—	e 14·8	—
Ottawa	32·5	286	—	—	—	—	e 12·6	—
Toronto	35·6	284	—	—	—	—	e 19·9	20·8
Pulkovo	36·1	47	—	—	—	—	e 20·4	—
Chicago	41·8	285	—	—	—	—	e 24·1	—
Ekaterinburg	52·1	45	9 50	+29	—	—	27·8	—
La Paz	72·5	221	11 8	−25	—	—	—	—

Additional readings: Toledo MNW = +11·0m. Granada i = +5m.4s.; all the readings have been increased by 3m. Toronto LN = +19·1m. Ottawa eLE = +15·8m.

Dec. 7d. Readings also at 10h. (La Paz), 14h. (near Algiers), 21h. (Uccle).

Dec. 8d. Readings at 0h. (Ekaterinburg, Ksara, Baku, and near Taihoku), 4h. and 6h. (La Paz), 8h. (Ekaterinburg, Baku, and Ksara), 9h. (Tortosa), 10h. (Ksara, Baku, and Athens), 11h. (near Tacubaya), 14h. (La Paz), 19h. (Baku), 21h. (Ksara), 22h. (Baku), 23h. (Fordham).

Dec. 9d. 11h. 53m. 0s. (I) } Epicentre 10°·2S. 143°·4E. (as on 1920 April 2d.).
16h. 21m. 45s. (II) }

A = −·790, B = +·587, C = −·177; D = +·596, E = +·803;
G = +·142, H = −·106, K = −·984.

Uncertain.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Riverview	24·7	164	e 5 48	+13	i 10 22	+25	e 11·8	14·2
II		24·7	164	e 6 48	+73	e 10 15	+18	e 10·8	17·8
I	Sydney	24·7	164	10 0	?S	(10 0)	+ 3	(12·2)	15·8
I	Adelaide	25·1	189	—	—	i 12 48	?L	e 16·1	18·4
I	Melbourne	27·6	177	—	—	e 11 18	+26	e 13·8	19·0
II		27·6	177	—	—	e 11 27	+35	—	18·6
I	Manila	33·3	320	e 8 0?	+61	(13 0?)	+31	13·0	—
II		33·3	320	e 9 15?	?PR_1	—	—	—	—
I	Perth	33·4	225	7 54	+54	13 6	+36	16·0	21·4
II		33·4	225	—	—	13 5	+35	16·0	21·5
I	Batavia	36·4	273	e 7 26	+ 1	—	—	—	10·9
II		36·4	273	i 9 6	?PR_1	—	—	—	—
I	Wellington	41·6	143	i 7 57	−11	i 14 7	−22	e 19·2	24·0
II		41·6	142	i 7 47	−21	i 14 3	−26	e 19·2	23·8
I	Osaka	45·5	351	8 28	− 9	—	—	13·5	16·9
I	Mizusawa E.	49·4	359	—	—	14 28	−103	—	—
I	Irkutsk	70·9	337	i 11 43	+21	i 20 25	−12	—	—
II		70·9	337	11 41	+19	20 25	−12	30·2	—
I	Ekaterinburg	94·6	328	13 28	−13	i 23 29	[−26]	35·0	49·4
II		94·6	328	e 14 21	+40	23 34	[−21]	33·2	—
I	Baku	99·2	311	—	—	23 47	[−33]	44·0	64·5
I	Pulkovo	110·3	331	—	—	—	—	45·0	—
I	Upsala N.	116·2	333	—	—	—	—	e 59·0	—
I	Uccle	127·3	328	—	—	—	—	e 63·0	—
II		127·3	328	—	—	—	—	62·2	—
I	Ann Arbor	127·9	42	e 23 0	?PR_1	—	—	e 37·5	—
I	Ottawa	131·5	35	e 22 0	?PR_1	—	—	e 37·5	—
II	La Paz	138·9	130	18 54	[−44]	—	—	—	—
I	San Fernando	142·0	319	—	—	40 0	?SR_1	—	79·5

Additional readings and notes: Riverview I ePR_1 = +6m.49s. and +7m.7s., MN = +17·8m. Sydney I gives S as P and L as S, also L = +14·2m. Adelaide I eSR_1 = +14m.6s. Perth I PR_1 = +9m.2s., PR_2 = +10m.15s., PR_3 = +11m.55s., SR_1 = +14m.35s., II PR_1 = +10m.10s., PR_2 = +11m.57s., SR_1 = +14m.20s. Batavia I i = +9m.45s. and +10m.26s. Wellington I SR_1 = +16m.39s., SR_2 = +17m.20s., L = +21·6m. and +23·0m.; T_o = 11h.53m.4s., II L = +21·7m. and +23·3m., T_o = 16h.21m.45s. Osaka I MN = +14·3m. Irkutsk I iP = +10m.49s., iS = +19m.25s., II P = +10m.46s., S = +19m.28s. Baku I MN = +54·3m.

Dec. 9d. Readings also at 1h. (near Batavia and Malabar), 8h. (near Tacubaya), 12h. (near Amboina and Victoria), 17h. (La Paz), 21h. (Apia), 22h. (Agana and Toronto).

Dec. 10d. Readings at 2h. (Ksara), 4h. (Agana), 5h. (La Paz), 6h. (near Tacubaya).

Dec. 11d. 16h. 33m. 15s. Epicentre 48°·0N. 8°·0E.

A = +·663, B = +·093, C = +·743 ; D = +·139, E = −·990 ;
G = +·736, H = +·103, K = −·669.

A rough solution based on 47°·0N. 10°·0E. of Nov. 7d. which was consistently unsuitable to nearly all the stations.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Strasbourg	0·6	345	i 0 7	− 2	e 0 14	− 3	0·3	0·5
Zurich	0·7	148	i 0 7	− 4	i 0 20	0	—	—
Besançon	1·6	239	0 37	+13	1 0	?L	(1·0)	1·0
Moncalieri	3·0	184	e 0 59	+12	—	—	—	—
Uccle	3·7	322	e 1 4	+ 6	—	—	—	—
Paris	3·7	285	e 1 25	+27	e 2 8	?L	(e 2·1)	2·4
De Bilt	4·5	337	—	—	—	—	e 2·4	—
Vienna	5·6	85	e 1 29	+ 2	—	—	—	2·8
Hamburg	5·7	11	e 1 45?	+17	—	—	—	3·8
Budapest	7·5	87	—	—	e 3 15	− 9	—	—
Konigsberg	10·4	44	—	—	—	—	5·4	8·0

Vienna gives also eE = +1m.58s., iEZ = +2m.2s., iZ = +2m.7s., iN = +2m.10s., i = +2m.22s. and +2m.27s., iE = +2m.26s.

Dec. 11d. 17h. 28m. 24s. Epicentre 41°·5S. 80°·0E.

A = +·130, B = +·738, C = −·663 ; D = +·985, E = −·174 ;
G = −·115, H = −·653, K = −·749.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Perth	30·0	85	6 16	−12	12 3	+29	13·5	14·4
Batavia	42·6	41	i 8 13	− 2	i 14 33	−10	—	—
Adelaide	45·6	101	—	—	i 15 18	− 4	i 22·0	25·0
Cape Town	48·0	260	15 54	?S	(15 54)	0	—	24·5
Colombo	48·4	0	15 56	?S	(15 56)	− 3	24·5	29·3
Melbourne	49·0	109	—	—	16 6	0	24·2	26·3
Kodaikanal	51·8	357	18 48	?S	(18 48)	+127	25·4	29·4
Riverview	55·3	107	—	—	(e 17 34)	+ 9	e 25·0	28·7
Sydney	55·3	107	17 24	?S	(17 24)	− 1	28·4	29·9
Hyderabad	59·0	358	e 13 6	?PR_1	—	—	23·8	33·6
Bombay	60·8	353	10 19	+ 1	18 36	+ 3	31·3	33·5
Manila	67·7	43	e 15 36?	?PR_1	—	—	—	—
Hong Kong	71·3	34	20 43	?S	(20 43)	+ 1	—	—
Simla E	72·7	357	25 54	?SR_1	—	—	—	—
Ksara E.	85·6	325	13 10	+19	e 23 11	−15	45·6	—
Baku	86·4	339	i 12 56	+ 1	i 23 36	+ 2	37·6	42·1
Irkutsk	96·1	14	—	—	e 24 55	−22	45·6	55·1
Ekaterinburg	99·7	350	—	—	e 24 53	−60	47·6	51·5
Konigsberg	108·7	328	—	—	—	—	e 81·6	—
Pulkovo	109·2	336	—	—	e 33 42	?SR_1	50·6	62·6
Tortosa N.	109·2	307	—	—	—	—	e 52·6	—
Granada	109·5	302	—	—	—	—	e 54·6	58·6
Strasbourg	110·2	317	—	—	—	—	e 56·6	—
San Fernando	110·7	300	—	—	56 13	?L	63·6	67·6

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hamburg		112·4	322	—	—	—	—	e 78·6	—
Paris		113·0	315	—	—	—	—	e 65·6	77·6
Uccle		113·3	318	—	—	e 35 36	?	e 60·6	—
Upsala	N.	113·5	331	—	—	—	—	e 63·6	—
De Bilt		113·8	319	—	—	—	—	e 63·6	86·4
La Paz		114·9	214	20 42	?PR_1	31 2	?	63·2	68·6
Oxford		116·7	315	—	—	—	—	—	89·4
Stonyhurst		118·5	318	—	—	—	—	—	86·6
Eskdalemuir		119·7	319	—	—	—	—	64·6	—
Edinburgh		119·9	319	—	—	—	—	e 74·6	—
Victoria	E.	162·2	59	—	—	—	—	79·2	85·9
Ottawa		162·2	291	—	—	—	—	77·6	—
Toronto	E.	164·7	285	—	—	—	—	79·6	96·5
Chicago	E.	170·8	276	—	—	47 41	?SR_1	94·2	—

Additional readings and notes: Perth $PR_1 = +9$m.6s., PS = +11m.4s.; all readings have been increased by 4m. Batavia i = +10m.21s., +13m.35s., +15m.32s., and +16m.29s. Adelaide $SR_1 = +18$m.54s. Riverview S is given as ePR_1?, also ePR_1? = +17m.41s., eS = +21m.18s., MN = +27·7m. Sydney S = +24m.48s. Simla ePN = +26m.0s. (?eSR_1N). Baku MN = +45·2m., MZ = +51·7m. Irkutsk $ePR_1 = +17$m.37s., e = +26m.19s., and +31m.33s., MZ = +56·4m. Ekaterinburg e = +17m.38s., +26m.26s., and +27m.10s., MZ = +55·8m. Paris MN = +82·6m. De Bilt e = +35m.24s., eN = +47m.6s., MN = +76·6m. Ottawa e = +46m.36s. and +51m.36s. Toronto LN = +98·7m.

Dec. 11d. 21h. 25m. 35s. Epicentre 39°·0N. 0°·0. (as on 1922 Sept. 15d.).

A = +·777, B = ·000, C = +·629.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Almeria	2·8	1 4	+20	2 13	+56	—	—
Toledo	3·2	—	—	—	—	e 2·2	3·6
Algiers	3·3	e 0 55	+ 3	—	—	1·4	1·6
Granada	3·4	i 1 8	+15	1 33	− 1	e 2·0	2·8
Malaga	4·2	e 1 5	0	e 3 29	?	e 3·9	5·1

Additional readings: Toledo MNW = +3·9m. Algiers iP = +58s.; all readings having been increased by 2m.

Dec. 11d. 23h. 1m. 0s. Epicentre 25°·2N. 56°·8E.

A = +·495, B = +·757, C = +·426; D = +·837, E = −·548; G = +·233, H = +·356, K = −·905.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Baku		16·2	341	3 57	+ 2	6 59	− 1	9·0	12·5
Ksara	E.	20·1	301	4 41	− 1	(8 26)	+ 1	(11·6)	11·9
Helwan		23·0	288	5 10	− 7	9 21	− 4	—	16·9
Ekaterinburg		31·7	5	e 6 44	0	11 57	− 6	16·0	20·4
Pulkovo		39·1	340	e 7 25	−22	—	—	e 18·4	—
Moncalieri		43·9	310	i 1 32	?	12 23	−158	24·6	—
Strasbourg		44·6	315	—	—	—	—	28·0	—
Irkutsk		44·7	40	—	—	—	—	i 24·4	—
De Bilt	N.	47·1	320	—	—	e 15 32	−10	e 24·0	—
Uccle		47·3	318	—	—	—	—	e 23·0	—
Eskdalemuir		52·6	322	—	—	—	—	29·0	—

Additional readings and notes: Baku MZ = +15·6m. Ksara LE = +9·0m., S is given as PR_1 and L as S. Ekaterinburg MZ = +22·9m. Irkutsk L = +27·0m. De Bilt eLE = +26·0m.

Dec. 11d. Readings also at 0h. (near La Paz), 3h. (Baku, near Ksara, and near Taihoku), 4h. (Apia, La Paz, La Plata, and near Granada), 10h. (Algiers), 12h. (La Paz), 19h. (Ekaterinburg), 20h. (Apia and near Zurich), 21h. (Ekaterinburg), 22h. (Bombay, Mizusawa, and Tacubaya).

Dec. 12d. 2h. 20m. 45s. Epicentre 56°·8N. 33°·6W. (as on 1924 Sept. 8d.).

A = +·456, B = −·303, C = +·837 ; D = −·553, E = −·833 ; G = +·697, H = −·463, K = −·548.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Edinburgh	16·7	80	—	—	—	—	i 8·8	—
Eskdalemuir	16·9	82	e 3 51	−13	—	—	7·2	9·2
Bidston	17·6	88	—	—	—	—	9·2	13·0
Stonyhurst	17·8	86	8 45	?L	—	—	(8·8)	—
Oxford	19·3	91	4 53	+20	—	—	—	11·4
De Bilt	22·7	85	e 5 7	− 6	e 9 9	−10	e 10·6	13·3
Uccle	22·9	89	e 5 9	− 7	—	—	e 10·8	—
Paris	22·9	95	e 5 13	− 3	e 9 20	− 3	11·2	—
Hamburg	24·7	79	e 5 15?	−20	—	—	17·2	—
Toledo	25·6	119	e 4 38	−66	—	—	—	13·3
Strasbourg	25·9	91	—	—	—	—	e 11·2	—
Moncalieri	28·1	97	8 30	+141	12 9	+68	14·5	—
Toronto E.	31·4	266	—	—	—	—	16·8	18·2
Rocca di Papa	32·9	95	—	—	—	—	e 4·5	23·4
Ekaterinburg	47·3	49	e 8 52	+ 3	e 15 48	+ 3	22·2	26·1
Baku	53·9	70	—	—	e 16 7	−61	26·8	33·2
La Paz	78·8	213	12 15	+ 3	—	—	—	—

Additional readings: De Bilt eLN = +11·4m., MZ = +13·8m. Toledo MNW = +11·5m. Ekaterinburg e = +19m.29s.

Dec. 12d. 3h. 28m. 42s. Epicentre 46°·5N. 13°·0E. (as on 1924 May 12d.).

A = +·671, B = +·155, C = +·725 ; D = +·225, E = −·974 ; G = +·707, H = +·163, K = −·688.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Laibach	1·1	113	i 0 23	+ 6	i 0 38	+ 7	—	0·7
Venice	1·1	204	i 0 23	+ 6	—	—	—	1·3
Vienna	2·9	52	e 0 50	+ 5	1 18	− 2	i 1·4	1·8
Florence	3·0	206	0 53	+ 6	—	—	—	2·2
Zurich	3·2	288	e 0 52	+ 2	i 1 34	+ 6	—	—
Moncalieri	4·0	249	0 47	−15	1 18	−32	—	2·0
Strasbourg	4·1	302	i 1 6	+ 2	1 58	+ 5	2·4	2·4
Budapest	4·3	75	1 24	+17	2 11	+13	i 2·6	—
Sarajevo	4·6	123	i 1 22	+11	i 2 34	+28	(i 2·6)	3·1
Rocca di Papa	4·7	183	e 1 11	− 2	i 2 40	+31	i 3·4	3·9
Mostar	4·7	131	i 1 10	− 3	i 2 17	+ 8	—	3·0
Besançon	4·9	280	1 14	− 2	2 9	− 5	—	3·1
Belgrade	5·5	106	e 0 54	−31	i 2 4	−27	—	2·3
Pompeii	5·8	169	e 1 58	+28	e 3 29	+50	(e 3·5)	6·5
Uccle	7·2	310	e 1 47	− 2	i 3 49	+34	i 3·9	—
Hamburg	7·4	346	e 1 18?	−34	—	—	—	—
Paris	7·4	292	e 2 24	+32	e 3 27	+ 6	4·2	4·3
De Bilt	7·6	321	e 2 18	+23	—	—	e 3·7	5·2
Konigsberg	9·6	27	—	—	e 4 5	−13	—	8·1
Tortosa N.	10·6	242	e 5 10	?L	—	—	(e 5·2)	—
Oxford	10·7	305	—	—	4 54	+ 6	7·4	7·7
Eskdalemuir	13·5	317	—	—	—	—	7·3	—
Upsala	13·6	10	—	—	—	—	e 7·1	8·7
Pulkovo	16·7	32	4 3	+ 2	9 6	+115	—	—
Ekaterinburg	30·6	53	6 42	+ 8	12 38	+54	15·3	—

Additional readings and notes: Vienna PR_1 = +53s., iNEZ = +1m.1s., PS = +1m.14s., iN = +1m.20s. Strasbourg P = +1m.17s., i = +1m.25s., and +1m.32s., MN = +2·8m. Budapest iN = +2m.39s., iE = +2m.58s. and +3m.4s. Rocca di Papa iPN = +1m.29s., iSN = +2m.48s. Mostar iP = +1m.18s. Besançon i = +1m.33s. Belgrade i = +56s. and +1m.25s. De Bilt MZ = +5·3m., MN = +5·6m., and notes the identity of the shock with that of May 12d. 8h. Konigsberg PZ = +5m.2s., Z = +5m.30s., MN = +7·8m. Upsala MN = +9·0m. Ekaterinburg readings are given as for 4h.

Dec. 12d. 7h. 20m. 54s. Epicentre 48°·0N. 8°·0E. (as on 11d.).

A = +·663, B = +·093, C = +·743 ; D = +·139, E = −·990 ;
G = +·736, H = +·103, K = −·669.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Strasbourg	0·6	345	i 0 7	− 2	0 14	− 3	0·3	0·4
Zurich	0·7	148	e 0 9	− 2	i 0 21	+ 1	—	—
Besançon	1·6	239	e 0 31	+ 7	1 3	+18	—	—
Uccle	3·7	322	e 1 6	+ 8	—	—	—	—
Paris	3·7	285	—	—	e 1 42	0	e 2·2	4·1
De Bilt	4·5	337	—	—	—	—	e 2·9	—
Vienna	5·6	85	e 1 55	+28	i 2 30	− 4	—	2·8
Hamburg	5·7	11	e 2 6?	+38	—	—	—	4·1

Vienna gives also i = +2m.1s., iZ = +2m.2s., i = +2m.13s., iZ = +2m.21s., i = +2m.26s.

Dec. 12d. 8h. 47m. 30s. Epicentre 40°·0S. 120°·0W.

A = −·383, B = −·663, C = −·643 ; D = −·866, E = +·500 ;
G = +·321, H = +·557, K = −·766.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington		48·2	245	—	—	i 15 54	− 2	e 20·3	24·7
La Paz		50·5	78	9 9	− 1	i 16 21	− 4	23·1	24·5
Apia		52·1	285	—	—	—	—	e 25·7	32·5
Riverview		68·2	243	—	—	e 20 18	+14	e 31·5	38·8
Chicago	N.	86·9	24	—	—	—	—	47·2	—
Victoria	E.	88·5	357	—	—	—	—	47·4	—
Toronto		91·3	28	—	—	—	—	i 44·9	—
Ottawa		94·1	30	—	—	—	—	e 46·5	—
Uccle		140·5	54	—	—	—	—	e 70·5	—
De Bilt		141·1	52	—	—	e 48 48	?	e 71·5	75·4
Irkutsk		147·6	306	—	—	—	—	76·5	87·2
Pulkovo		153·0	33	—	—	—	—	85·5	—
Ekaterinburg		163·2	359	e 58 32	?	—	—	82·5	90·7
Baku		172·3	84	—	—	e 44 30	?SR,	76·5	95·1

Additional readings and notes: Apia e = +27m.0s. Riverview MN = +36·6m. Chicago L = +51·0m. Victoria LN = +52·8m. Toronto i = +50·9m., LN = +52·8m. Ottawa eN = +49·5m. De Bilt MZ = +75·0m. Irkutsk MZ = +81·6m. Baku MN = +104·3m., MZ = +104·7m.

Dec. 12d. 23h. 44m. 50s. Epicentre 11°·5S. 112°·0E. (as on 1921 Sept. 11d.).

A = −·367, B = +·909, C = −·199 ; D = +·927, E = +·375 ;
G = +·075, H = −·185, K = −·980.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Malabar	6·0	314	i 1 19	−13	i 2 14	−30	—	—
Batavia	7·3	316	i 1 37	−14	i 2 53	−25	—	5·4
Manila	27·6	19	e 7 35	+91	(10 45)	− 7	i 10·8	11·3
Adelaide	33·7	139	—	—	12 10	−26	17·3	19·1
Hong Kong	33·9	4	—	—	—	—	—	22·2
Colombo	36·9	299	7 15	−14	16 10	?L	(16·2)	26·2
Melbourne	39·5	138	—	—	13 52	− 7	20·6	21·9
Riverview	42·1	130	—	—	e 14 28	− 8	e 21·4	34·4
Hyderabad	44·0	310	7 58	−28	14 18	−44	20·7	25·0
Bombay	49·1	310	8 41	−20	15 41	−26	24·9	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington	62·1	132	—	—	—	—	e 31·9	35·4
Irkutsk	64·1	355	e 10 10?	−29	19 6	− 8	—	—
Baku	77·3	318	i 11 58	− 5	21 36	−16	35·2	47·6
Ekaterinburg	80·3	334	i 12 31	+10	22 29	+ 2	36·2	46·3
Pulkovo	95·7	330	—	—	e 24 7	[+ 7]	48·2	—
Strasbourg	108·0	319	—	—	—	—	45·2	—
De Bilt	109·4	322	—	—	—	—	e 59·2	70·2
Uccle	110·0	321	—	—	—	—	e 59·2	—
Eskdalemuir	113·6	326	—	—	—	—	59·2	—
Ottawa	145·4	8	e 19 42	[− 7]	e 69 40	?	e 79·2	—
Toronto	146·4	13	—	—	—	—	80·2?	—
La Paz	152·0	180	19 59	[0]	34 2	?	76·7	79·3

Additional readings: Batavia i = +2m.29s. Manila MN = +11·2m. Riverview e = +17m.4s., MN = +23·0m. Wellington L = +34·4m. Baku MN = +40·3m. Pulkovo e = +25m.52s. and +30m.58s. De Bilt MN = +63·0m.

Dec. 12d. Readings also at 0h. (Granada), 1h. (Ottawa), 2h. (Baku, Ekaterinburg, and Konigsberg), 3h. (Apia and Laibach), 4h. (Mizusawa and Nagoya), 5h. (Ekaterinburg and near Taihoku), 9h. (Ekaterinburg), 10h. (La Paz and near Zurich and Laibach), 11h. (near Manila), 17h. (La Paz, De Bilt, Ekaterinburg, and near Lisbon), 21h. (Apia and Zi-ka-wei), 22h. (Balboa Heights), 23h. (Nagasaki).

Dec. 13d. 18h. 53m. 30s. Epicentre 38°·0N. 33°·5E. (as on 1922 Aug. 29d.).

A = +·657, B = +·435, C = +·616; D = +·552, E = −·834; G = +·513, H = +·340, K = −·788.

Very uncertain.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ksara	E.	4·6	154	1 54	+43	3 26	+80	3·6	4·0
Athens		7·7	273	—	—	—	—	e 5·5	5·8
Baku		12·9	74	—	—	5 6	−36	7·0	7·6
Vienna		16·1	315	e 4 11	+18	—	—	—	—
Laibach		16·2	306	i 4 9	+14	i 4 13	?	—	4·2
Venice		17·4	302	i 3 30	−40	—	—	—	5·9
Innsbruck		18·6	307	i 3 21	−63	e 3 34	?	—	—
Pulkovo		21·8	356	5 4	+ 1	e 9 4	+ 3	—	—
Ekaterinburg		26·0	35	5 49	+ 1	10 2	−20	13·0	—

Additional readings: Baku MN = +7·9m.

Dec. 13d. 20h. 24m. 32s. Epicentre 36°·5N. 138°·5E.

A = −·602, B = +·533, C = +·595; D = +·663, E = +·749; G = −·446, H = +·394, K = −·804.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagoya		1·9	223	1 6	?S	(1 6)	+13	1·7	2·2
Osaka		3·1	234	0 47	− 2	(1 27)	+ 1	1·4	2·1
Kobe		3·3	237	0 45	− 7	1 24	− 7	2·6	2·8
Mizusawa	E.	3·3	38	0 54	+ 2	1 36	+ 5	—	—
Irkutsk		28·7	314	e 5 33	−42	(11 25)	+13	14·1	—
Ekaterinburg		53·8	318	i 9 9	−23	—	—	25·5	—
Pulkovo		67·2	329	10 17	−42	—	—	—	—
Riverview		71·4	168	—	—	—	—	e 65·7	66·5
Perth		71·6	200	—	—	—	—	e 71·5	—

Additional readings: Nagoya MN = +2·0m. Osaka MN = +2·2m. Kobe MNZ = +3·4m. Mizusawa PN = +53s. Irkutsk gives S as P of another shock for which S = +13m.41s. Riverview MN = +69·5m.

Dec. 13d. Readings also at 2h. (Nagasaki), 3h. (near Tacubaya), 4h. (La Paz) 9h. (Kobe), 15h. (near Zurich), 18h. (Zi-ka-wei and near Zurich), 20h. (Nagasaki), 21h. (Agana (2)), 22h. (Agana and Balboa Heights), 23h. (near Malabar).

Dec. 14d. 9h. 6m. 20s. (I) } Epicentre 82°·0N. 38°·0W.
9h. 23m. 36s. (II) }

A = +·110, B = −·086, C = +·990 ; D = −·616, E = −·788 ;
G = +·780, H = −·610, K = −·139.

Uncertain.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Pulkovo		28·2	98	e 6 24	+14	e 9 4	−119	—	—
II		28·2	98	6 11	+ 1	11 3	0	13·4	16·7
I Eskdalemuir		28·4	137	—	—	—	—	13·7	—
I De Bilt		32·4	130	—	—	—	—	e 16·7	—
II		32·4	130	—	—	—	—	e 15·4	—
I Ekaterinburg		35·2	72	e 7 11	− 4	e 11 30	−88	15·2	22·4
II		35·2	72	e 7 17	+ 2	i 12 14	−44	15·4	18·9
I Strasbourg		36·2	129	—	—	—	—	23·7	—
I Ottawa		38·5	223	—	—	—	—	e 18·7	—
II		38·5	223	—	—	—	—	e 19·4	—
I Toronto	N.	40·6	228	—	—	—	—	27·7	—
II	E.	40·6	228	—	—	—	—	28·3	28·8
I Victoria	E.	41·6	275	—	—	—	—	25·0	25·9
I	N.	41·6	275	—	—	—	—	27·8	28·7
II	E.	41·6	275	—	—	—	—	25·7	26·6
II	N.	41·6	275	—	—	—	—	27·9	29·7
I Chicago		43·3	236	—	—	14 41	−11	22·4	—
II		43·3	236	—	—	—	—	18·8	—
I Irkutsk		44·3	33	—	—	—	—	e 20·7	—
I Baku		49·8	87	—	—	—	—	24·7	32·0
II		49·8	87	—	—	—	—	24·4	32·8
I Perth		129·1	29	—	—	—	—	e 59·8	—
I Riverview		131·7	350	—	—	—	—	e 53·5	56·5

Additional readings: De Bilt II eLN = +16·4m. Ekaterinburg II MZ = +23·4m. Ottawa I eN = +15m.10s., eE = +22m.40s., e = +27m.10s. Baku II MN = +32·9m. Riverview I MN = +56·9m.

Dec. 14d. 21h. 10m. 0s. Epicentre 33°·0S. 66°·0W.

A = +·341, B = −·766, C = −·545 ; D = −·914, E = −·407 ;
G = −·222, H = +·498, K = −·839.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
La Plata	E.	7·0	107	i 1 44	− 2	3 16	+ 6	3·6	4·0
	N.	7·0	107	1 42	− 4	3 1	− 9	3·6	3·8
La Paz		16·6	353	4 2	+ 2	7 7	− 2	8·6	9·4
Rio de Janeiro		22·5	69	e 5 8	− 3	9 15	0	11·8	12·5
Ekaterinburg		136·9	40	—	—	—	—	76·0	—

La Plata gives also E = +2m.20s., N = +3m.26s. ; T_0 = 21h.10m.4s.

Dec. 14d. Readings also at 13h. (near Taihoku), 14h. and 15h. (near Amboina).

Dec. 15d. 20h. 48m. 50s. Epicentre 15°·7S. 167°·3E. (as on 1921 July 31d.).

$A = -\cdot939$, $B = +\cdot212$, $C = -\cdot271$; $D = +\cdot220$, $E = +\cdot975$; $G = +\cdot264$, $H = -\cdot059$, $K = -\cdot963$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	20·3	87	e 4 55	+10	e 8 20	− 9	—	—
Riverview	23·4	216	e 5 29	+ 8	e 9 37	+ 4	e 12·0	12·8
Sydney	23·4	216	5 22	+ 1	(9 52)	+19	9·9	11·6
Wellington	26·4	167	i 6 0	+ 8	i 10 22	− 8	i 11·1	19·7
Adelaide	32·1	229	e 7 4	+16	e 12 4	− 6	e 16·5	25·2
Perth	49·3	240	i 8 52	−10	i 17 4	+54	24·0	30·0
Manila	54·9	301	e 10 29	+51	(i 17 21)	+ 1	i 17·4	—
Osaka	58·8	330	13 13	?PR_1	(18 11)	+ 2	18·2	21·0
Batavia	59·9	272	i 10 25	+14	i 18 24	+ 2	—	—
Taihoku	60·4	312	e 16 35	?	—	—	—	—
Zi-ka-wei	64·1	319	i 10 25	−14	19 0	−14	—	—
Hong Kong	64·4	305	10 49	+ 8	(19 17)	− 1	19·3	—
Irkutsk	87·0	326	i 12 56	− 3	i 23 14	[+ 5]	36·2	—
Victoria E.	88·7	38	23 13	?S	(23 13)	[− 7]	39·1	49·0
N.	88·7	38	23 36	?S	(23 36)	[+16]	37·2	52·8
Kodaikanal	92·6	280	26 16	?S	(26 16)	+95	(49·5)	—
Hyderabad	93·6	286	e 14 8	+32	—	—	—	26·8
Bombay	99·1	286	e 17 10	?PR_1	—	—	—	—
Chicago	111·6	50	—	—	e 26 25	−77	52·4	—
Ekaterinburg	112·2	325	e 19 12	?PR_1	e 26 30	−78	44·2	55·6
Toronto N.	117·6	47	—	—	e 30 25	?	51·7?	55·2
Ottawa E.	120·0	45	—	—	e 27 10	−99	56·2	—
Baku	120·8	309	e 20 11	?PR_1	30 35	?	46·7	66·5
Kucino	124·6	328	e 27 47	?S	(e 27 47)	−96	56·0	59·2
Pulkovo	126·1	335	e 19 16	[+ 8]	—	—	58·2	72·8
Upsala	130·7	340	e 22 46	?PR_1	—	—	—	—
Ksara E.	132·8	302	19 33	[+ 8]	22 48	?PR_1	23·9	—
Hamburg	138·2	340	20 10?	[+34]	—	—	—	24·2
Vienna Z.	139·7	330	e 19 36	[− 3]	—	—	—	—
Eskdalemuir	139·7	351	22 10?	?PR_1	—	—	—	—
De Bilt	140·9	341	i 20 40	[+59]	—	—	e 66·2	—
Uccle	142·3	341	—	—	—	—	56·2	—
Venice	143·6	330	e 20 7	[+21]	—	—	—	—
Zurich Z.	143·8	336	i 19 48	[+ 1]	—	—	—	—
Pompeii	145·6	322	e 19 46	[− 3]	e 20 16	?	—	—
Rocca di Papa	146·0	325	i 19 56	[+ 6]	—	—	—	—
Moncalieri	146·0	335	i 19 20	[−30]	23 47?	?PR_1	29·6	—
Tortosa N.	152·4	338	e 20 8	[+ 9]	—	—	—	—
Granada	157·1	341	i 20 8	[+ 3]	24 20	?PR_1	89·2	106·4
Malaga	157·7	342	20 9	[+ 3]	e 25 33	?PR_1	—	—

Additional readings and notes: Apia e = +5m.57s. and +7m.12s. Riverview ePR_1 = +6m.0s. and +6m.18s., PS = +9m.49s., SR_1 = +10m.32s. and +10m.56s., MN = +14·0m. Adelaide e = +18m.10s., +19m.58s., and +21m.22s. Perth PR_1 = +13m.21s., iPS = +16m.5s., SR_1 = +20m.42s. Osaka MN = +20·7m. Irkutsk PR_1 = +16m.54s. Kodaikanal readings are given as two separate P's. Chicago E = +29m.33s. Ekaterinburg i = +21m.3s., e = +25m.49s., and +28m.32s., i = +29m.56s., MN = +56·2m., MZ = +69·4m. Toronto LE = +57·6m. Ottawa eE = +30m.10s. Baku e = +21m.4s. and +21m.34s., MZ = +50·9m., MN = +67·2m. Kucino ePR_1 = +31m.25s., eS = +37m.40s., MN = +58·3m. Pulkovo MN = +64·7m. Vienna iZ = +19m.44s. De Bilt ePR_1Z = +23m.32s., eLN = +68·2m. Granada i = +20m.38s., +21m.35s., and +26m.10s., eL = +30·7m.

Dec. 15d. Readings also at 16h. (Perth and Victoria), 18h. (Melbourne), 23h. (near Taihoku).

Dec. 16d. Readings at 0h. (Baku and near Tacubaya), 4h. (Agana), 6h. (near La Paz), 7h. (Nagasaki and Honolulu), 12h. (near Batavia and Malabar), 16h. (near Oaxaca and near Batavia and Malabar), 21h. (Ottawa, Toronto, Ithaca, Chicago, La Paz, and near Merida), 23h. (near Mizusawa).

Dec. 17d. Readings at 0h. (Ksara), 6h. (Ekaterinburg, Baku, Pulkovo, Edinburgh, Eskdalemuir, De Bilt, Uccle, Strasbourg, Stonyhurst, Toronto, Ottawa, Georgetown, Ithaca, Harvard, Chicago, Ann Arbor, and Victoria), 8h. (near Manila), 11h. (near La Paz, La Plata), 12h. (La Paz and La Plata), 13h. (Ekaterinburg), 15h. (La Paz), 16h. (Apia, La Plata, and La Paz), 17h. (Apia, Ekaterinburg, and Manila), 22h. (La Paz), 23h. (La Plata).

Dec. 18d. 15h. 24m. 40s. Epicentre 28°·5S. 71°·5W. (as on 1923 Aug. 7d.).

$A = +\cdot279$, $B = -\cdot833$, $C = -\cdot477$; $D = -\cdot948$, $E = -\cdot317$; $G = -\cdot151$, $H = +\cdot453$, $K = -\cdot879$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz		12·4	15	i 3 7	+ 2	i 5 38	+ 9	6·5	7·9
La Plata	E.	13·2	122	3 14	− 2	5 34	−15	6·7	7·6
	N.	13·2	122	3 30	+14	5 53	+ 4	6·8	7·6
Rio de Janeiro		26·1	84	e 5 43	− 6	9 50	−34	e 16·1	—
Uccle		103·6	39	—	—	—	—	e 54·3	—
De Bilt		104·6	38	—	—	—	—	e 57·3	—
Ekaterinburg		136·2	37	—	—	—	—	70·3	—

La Plata gives also E = +6m.29s. and +6m.57s.

Dec. 18d. Readings also at 2h. (Apia), 3h. and 4h. (La Paz), 5h. (Florence), 13h. (Taihoku), 22h. (La Paz).

Dec. 19d. Readings at 2h. (Algiers), 8h. and 10h. (4) (Nagasaki), 11h. (Taihoku), 16h. (La Paz and Ekaterinburg), 17h. (near La Paz).

Dec. 20d. Readings at 2h. and 3h. (Baku), 6h. (Ksara), 18h. (near Chur and Zurich), 21h. (Ekaterinburg).

Dec. 21d. 12h. 58m. 42s. Epicentre 34°·5N. 138°·0E. (as on 1920 June 22d.).

$A = -\cdot613$, $B = +\cdot551$, $C = +\cdot566$.

	Δ	P.	O−C.	S.	O−C.	L.	ME.	MN.
	°	m. s.	s.	m. s.	s.	m.	m.	m.
Nagoya	1·2	0 15	− 3	(0 27)	− 6	0·5	0·9	0·6
Osaka	2·2	0 36	+ 2	(0 50)	−10	0·8	1·3	1·1
Kobe	2·4	0 38	+ 1	(0 54)	−12	0·9	0·9	1·3
Riverview	69·4	—	—	—	—	e 32·4	36·5	36·4
Wellington	82·9	—	—	i 22 23	[−19]	e 24·4	—	—

No additional readings.

Dec. 21d. Readings also at 2h. (Apia), 3h. (Ekaterinburg), 14h. (Perth), 15h. (Rocca di Papa and near Tacubaya), 16h. (Irkutsk and Taihoku), 19h. (La Paz and La Plata), 21h. (Apia, Irkutsk, and near Osaka), 22h. (Baku).

Dec. 22d. 6h. 50m. 40s. Epicentre 45°·0N. 11°·0E. (as on 1923 June 28d.).

$A = +·694$, $B = +·135$, $C = +·707$; $D = +·191$, $E = -·982$; $G = +·694$, $H = +·135$, $K = -·707$.

Rough.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Venice		1·1	65	0 14	− 3	—	—	—	1·1
Florence		1·2	171	0 4	−14	—	—	—	0·5
Innsbruck		2·3	7	e 0 27	− 9	i 1 12	+ 9	—	—
Moncalieri		2·3	270	i 0 0	−36	0 39	−24	0·7	—
Zurich		2·9	325	i −0 4	−49	i 1 11	− 9	—	—
Rocca di Papa	E.	3·5	159	e 0 35	−20	e 1 19	−18	—	1·9
	N.	3·5	159	0 41	−14	e 1 24	−13	—	—
	Z.	3·5	159	0 39	−16	e 1 17	−20	—	—
Strasbourg		4·1	330	e 1 15	+11	e 2 7	+14	2·6	—
Besançon		4·1	305	e 1 10	+ 6	e 1 59	+ 6	—	—
Vienna		4·9	47	e 1 29	+13	—	—	i 2·9	3·0
Pompeii		5·0	147	e 1 10	− 7	e 2 25	+ 8	—	—
Budapest		6·1	63	—	—	e 2 50	+ 4	—	—
Uccle		7·3	325	e 3 2	?S	(e 3 2)	−16	—	—
De Bilt		8·0	334	—	—	—	—	e 4·3	—
Ekaterinburg		32·6	51	—	—	—	—	16·8	—

Additional readings: Venice PE = +18s., PN = +20s. Strasbourg P? = +1m.45s. Vienna i = +2m.10s. and +2m.35s.; epicentre 44°·5N. 10°·8E.

Dec. 22d. 17h. 49m. 42s. Epicentre 39°·6N. 27°·7E. (as on 1919 Nov. 18d.).

$A = +·682$, $B = +·358$, $C = +·637$; $D = +·465$, $E = -·885$; $G = +·564$, $H = +·296$, $K = -·770$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		3·5	242	e 0 53	− 2	e 1 20	− 7	1·6	1·8
Belgrade		7·4	316	e 4 11	?L	i 4 45	?	(e 4·2)	5·0
Ksara	E.	8·7	129	e 3 26	?S	(e 3 26)	−30	7·0	—
Rocca di Papa		11·6	285	e 3 40	+47	e 7 5	?L	e 8·5	9·0
Moncalieri		15·7	296	e 2 38	−70	6 33	−15	9·8	—
Uccle		19·8	312	e 4 41	+ 2	—	—	e 11·3	—
De Bilt		19·9	316	—	—	—	—	e 11·3	—
Pulkovo		20·2	4	i 4 51	+ 8	—	—	12·3	—
Upsala		21·2	346	—	—	—	—	e 12·3	—
Ekaterinburg		27·5	40	—	—	(10 18)	−32	10·3	—

Athens gives also MN = +1·9m. Moncalieri readings have been increased by 1h.

Dec. 22d. Readings also at 0h. (La Paz), 3h. (Colombo), 15h. and 21h. (La Paz), 23h. (Irkutsk).

Dec. 23d. 17h. 4m. 50s. Epicentre 41°·0N. 24°·6E. (as on 1921 May 10d.).

$A = +·686$, $B = +·314$, $C = +·656$; $D = +·416$, $E = -·909$; $G = +·596$, $H = +·273$, $K = -·755$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·2	192	e 0 59	+ 9	1 36	+ 8	e 1·7	2·2
Belgrade	4·9	324	e 1 4	−12	i 1 57	−17	—	2·2
Sarajevo	5·4	305	e 1 37	+14	2 48	+20	(2·8)	3·0
Mostar	5·5	297	e 1 25	0	i 2 59	+28	(3·0)	3·3
Budapest	7·6	331	1 10?	−45	—	—	i 3·9	—
Pompeii	7·6	272	e 1 49	− 6	e 4 50	?L	(e 4·8)	6·0
Lemberg	8·8	358	− e 1 14	?	—	—	—	3·7
Rocca di Papa	9·0	279	2 0	−16	e 4 36	+33	e 5·4	6·7
Vienna	9·3	324	e 1 57	−23	3 57	−13	—	5·2

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Venice	9·9	300	5 10	?L	—	—	(5·2)	7·4
Innsbruck N.W.	11·3	308	e 2 22	−27	—	—	—	—
Moncalieri	12·9	293	1 34	−98	5 2	−40	7·4	—
Zurich	13·1	305	e 3 17	+ 3	—	—	—	6·6
Konigsberg	14·1	350	—	—	e 6 4	− 6	i 7·8	8·6
Strasbourg	14·1	308	—	—	(5 10?)	−60	i 8·2	—
Hamburg	16·0	327	—	—	—	—	e 9·2	—
Kucino	17·1	26	e 7 38	?S	(e 7 38)	+18	e 9·3	11·1
Uccle	17·1	312	—	—	—	—	e 8·7	—
De Bilt	17·3	316	—	—	—	—	e 9·0	9·6
Pulkovo	19·0	9	4 6	−23	—	—	9·7	10·8
Baku	19·1	83	—	—	e 7 49	−15	11·2	—
Upsala	19·3	349	—	—	—	—	e 10·3	12·3
Ekaterinburg	28·0	43	e 5 55	−13	e 10 54	− 5	14·2	17·0

Additional readings: Athens MN = +2·8m. Belgrade iP = +1m.16s. Budapest iN = +4m.9s. Rocca di Papa ePN = +1m.50s., ePZ = +2m.6s. Vienna iZ = +2m.28s. and +2m.45s., PR_1 = +2m.41s., i = +4m.31s., SR_1 = +5m.4s. Innsbruck reading is given for 18h. Ksara (Δ = 11°·5 Az. = 125°) gives e = 17h.1m.12s. Konigsberg MN = +10·1m. Kucino i = +9m.57s. De Bilt MZ = +10·4m. Pulkovo MN = +11·4m., MZ = +11·5m. Ekaterinburg MN = +15·0m.

Dec. 23d. Readings also at 1h. (Nagasaki), 7h. (Tacubaya (2) and Puebla (2)), 8h. (Oaxaca (2) and Vera Cruz (2)), 10h. (Puebla, Vera Cruz, Oaxaca, Tacubaya, and Nagasaki), 17h. (Nagasaki (2) and Irkutsk), 22h. (Oaxaca, Vera Cruz, and Tacubaya), 23h. (Vera Cruz and Tacubaya).

Dec. 24d. 17h. 1m. 36s. Epicentre 19°·0N. 120°·5E. (as on 1922 Oct. 14d.).

A = −·480, B = +·815, C = +·326; D = +·862, E = +·507; G = −·165, H = +·280, K = −·946.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	4·4	173	i 1 9	+ 1	(i 1 47)	−14	i 1·8	—
Hong Kong	6·7	301	1 52	+10	—	—	4·2	4·7
Irkutsk	35·6	344	7 15	− 3	12 58	− 6	19·4	23·2
Colombo	41·3	260	20 24	?L	—	—	(20·4)	25·9
Ekaterinburg	57·8	327	i 10 14	+16	—	—	30·4	31·4
Baku	63·3	309	—	—	—	—	36·4	42·2
Kucino	70·3	325	—	—	—	—	e 38·4	—
Vienna Z.	84·9	320	e 12 47	0	—	—	—	—
De Bilt E.	89·5	326	—	—	—	—	e 57·4	—

Additional readings: Ekaterinburg MN = +37·3m., MZ = +37·4m. De Bilt eLN = +53·4m.

Dec. 24d. 22h. 3m. 30s. Epicentre 21°·5S. 179°·0W.

A = −·930, B = −·016, C = −·367; D = −·017, E = +1·000; G = +·366, H = +·006, K = −·930.

Deduced from 20°·5S. 178°·5W. of 1924 Jan. 16d.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	10·3	43	e 1 30	−64	—	—	—	2·5
Wellington	20·4	193	i 4 51	+ 5	i 8 41	+ 9	—	—
Riverview	29·0	238	e 6 16	− 2	e 11 14	− 3	e 13·5	16·5
Perth	58·3	244	—	—	e 18 17	+14	—	—
Osaka	70·9	322	11 44	+22	—	—	—	21·9
Batavia	73·0	271	i 11 38	+ 2	i 20 58	− 4	—	—
Hong Kong	78·5	300	—	—	(22 0)	− 6	—	22·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria	E.	85·8	33	—	—	(21 8)	−140	21·1	21·2
Irkutsk		99·2	323	e 16 7	?	i 23 47	[−33]	—	—
La Paz		102·3	114	17 18	[−37]	i 24 14	[−21]	29·9	32·4
Chicago		105·1	50	27 13	?S	(27 13)	+30	56·2	—
Kodaikanal		106·2	274	29 6	?	—	—	—	—
Toronto		111·5	48	e 18 56	[+29]	e 26 0	−102	47·8	—
Ottawa		114·3	47	18 58	[+23]	26 23	−101	50·5	—
Ekaterinburg		124·3	324	18 53	[−11]	25 37	?	35·5	—
Baku		134·7	305	i 21 47?	?PR_1	e 31 6	?	49·5	65·0
Pulkovo		136·4	339	e 22 26	?PR_1	e 23 32	?	—	—
Dyce		144·2	3	—	—	—	—	50·9	—
Ksara		146·9	299	e 19 32	[−19]	—	—	—	—
Hamburg	Z.	147·2	350	e 19 30?	[−21]	—	—	—	—
De Bilt		149·3	354	i 20 27	[+32]	e 41 54	?SR_1	—	—
Vienna	Z.	150·6	339	19 32	[−25]	—	—	—	—
Florence		156·2	341	—	—	—	—	41·5	42·5
Rocca di Papa		157·5	337	e 20 18	[+12]	—	—	—	—

Additional readings: Riverview PR_1 = +7m.30s. and +7m.48s. Perth S? = +19m.42s. Osaka MN = +21·2m. Batavia i = +12m.19s., +13m.21s., and +22m.46s.; all readings for this station are given as i. Irkutsk i = +24m.47s. Chicago iE = +32m.31s., S = +33m.42s. Toronto eE = +24m.26s. Ottawa iE = +24m.36s., +25m.40s., and +28m.15s. Ekaterinburg iP = +20m.48s., i = +27m.17s., iS = +28m.23s., iPS = +28m.59s. Baku i = +22m.22s. and +23m.5s., MN = +66·0m. Dyce i = +43m.25s. and +45m.47s., L = +47·8m.

Dec. 24d. Readings also at 2h. (Apia and near La Paz), 10h. (Ksara), 21h. (Zante).

Dec. 25d. 17h. 53m. 0s. Epicentre 36°·0N. 5°·0W. (as on 1924 Sept. 22d.).

A = +·806, B = −·071, C = +·588.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Malaga	0·9	0 15	+ 1	0 19	− 6	0·4	0·4
Granada	1·6	0 17	− 7	—	—	0·4	—
Almeria	2·3	0 32	− 4	0 59	− 4	—	—
Toledo	3·9	e 1 22	+21	1 55	+ 8	e 2·1	2·6

Additional readings: Granada i = +21s. Toledo P = +1m.30s.

Dec. 25d. Readings also at 1h. (Perth, Riverview, and Ksara), 2h. (De Bilt), 4h. (Fordham), 6h. (Apia), 7h. (Ksara), 15h. (Manila), 19h. (near Malaga), 23h. (Apia).

Dec. 26d. 23h. 31m. 20s. Epicentre 17°·0S. 168°·0W. (as on 1922 Feb. 20d.).

A = −·935, B = −·199, C = −·292; D = −·208, E = +·978; G = +·286, H = +·061, K = −·956.

But see note at end.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Suva		13·1	263	i 3 15	+ 1	i *4 25*	*−81*	—	—
Wellington		28·5	208	i *4 44*	*−89*	i *7 21*	*−227*	7·9	14·9
Riverview		40·2	237	e 8 44	?PR_1	e *12 59*	*−71*	e 13·7	15·6
Adelaide		50·7	238	e 11 40	?PR_1	i 16 16	−11	—	24·2
Perth		69·6	241	11 9	− 6	i 15 55	?PR_1	23·4	—
Victoria		76·5	29	22 6	?S	(22 6)	+23	26·2	26·2
Manila		76·9	290	e 10 56	−64	—	—	i 19·5	—
Malabar		82·6	266	i 11 11	−83	19 34	−199	—	—
Batavia		83·6	266	13 6	+26	23 6	+ 1	—	—
Hong Kong		85·7	295	11 45	−67	(20 47)	−160	20·8	—
La Paz		94·2	109	e 17 2	?PR_1	i 23 32	[−21]	27·6	28·3
Toronto	N.	100·6	47	e 5 8	?	(26 0)	− 1	26·0	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ottawa	103·5	46	e 4 40	?	e 26 33	+ 4	—	—
Bombay	122·4	281	20 59	?PR$_1$	—	—	—	—
Pulkovo	135·2	347	21 38	?PR$_1$	30 56	?	44·7	—
Kucino	136·5	339	21 39	?PR$_1$	e 30 33	?	—	—
De Bilt	144·5	6	i 19 30	[−17]	—	—	—	—
Uccle	145·6	9	e 19 36	[−13]	—	—	e 45·7	—
Strasbourg	148·2	5	e 19 40	[−13]	i 22 40	?PR$_1$	—	—
Vienna	148·5	354	e 19 29	[−24]	i 24 8	?PR$_1$	—	—
Budapest	149·0	350	e 19 40	[−14]	—	—	—	—
Ksara	152·7	313	e 19 25	[−35]	22 55	?PR$_1$	24·3	—
Rocca di Papa	155·2	358	e 20 17	[+15]	—	—	—	—
Algiers	158·7	20	43 34	?SR$_1$	—	—	—	—

NOTES TO DEC. 26d. 23h. 31m. 20s.

Before giving the usual additional readings it is desirable to make some general comments on this case, where at least three separate shocks seem to have occurred within a few minutes. We may call them for convenience

A at 23h. 31m. 20s.
B at 23h. 32m. 43s. (Wellington)
C at 23h. 40m. 30s.

and it seems possible that there was an additional local shock near Toronto and Ottawa. In the first instance an attempt was made to represent all the readings as due to a single shock, with an epicentre 29°·2S. 177°·0W. (as on 1921 May 14) chiefly on the strength of a note by Wellington (" near the Kermadec Islands " 29°·3S. 177°·9W.); but it became clear that this would not suit other observations, especially those in Europe, where (if T$_0$ be adopted from Wellington as in shock B) the wave [P] would arrive about 2 min too early, corresponding to an unprecedented focal depth. The separate shock C was readily identified from the Ekaterinburg and Irkutsk observations, but the Riverview observations could not be reconciled *inter se* as due to a single shock, and there are other indications (*e.g.*, a number of impulses registered at Ekaterinburg) that several shocks might be overlapping.

To consider first the Riverview readings. Referring them to the T$_0$ of shock B (which is taken from Wellington) they are

eP = +7m.21s. iPR$_1$ = +8m.35s. PR$_2$ = +8m.58s.

Now these suit a distance Δ = 36°·0 admirably, the tabular values for this value of Δ being

P = +7m.22s. PR$_1$ = +8m.34s. PR$_2$ = +8m.57s.

and it might therefore be thought that we had a specially accurate solution with Δ for Wellington 13°·8, for Riverview 36°·0, and the usual ambiguity (of a determination from two stations only) removed by the consideration that we must take the alternative nearest Suva. Unfortunately this solution is impossible; for the direct distance between Wellington and Riverview is only 20°·1, which is smaller by 2°·2 than the minimum required. Moreover a distance of Δ = 36°·0 for Riverview will not suit its S observation, which indicates about Δ = 30°·0. Apparently we must assume more than one shock, and since we cannot associate the Riverview Δ = 36° with the Wellington observation let us try the Riverview Δ = 30°, given by its S. This determined the epicentre 32°·0S. 173°·0W. for shock B. (It is near the 33°·3S. 173°·7W. adopted on 1921 April 15d. 21h., but this actual position is too near Wellington and Riverview). And it was satisfactory to find that readings at several other observatories, especially Suva, fell into fair accordance.

We now return to the Riverview readings of P, PR$_1$, and PR$_2$, with the corresponding Δ = 36°. On trial it was found practically impossible to bring these into accordance with other observations on the hypothesis of a shock nearly simultaneous with B, chiefly for the reason that the European readings would be too early. But other considerations tending in the same direction were introduced by the Pulkovo and Kucino readings which with the T$_0$ = 23h. 32m. 43s. (adopted for shock B and presumed for shock A) are given as follows:—

Pulkovo P = +20m.15s., PR$_1$ = +23m.45s., PR$_2$ = +26m.17s., SR$_2$ = +37m.41s.
Kucino P = +20m.16s., PR$_1$ = +23m.34s., PR$_2$ = +26m. 6s.

It will be seen that the intervals $PR_2 - PR_1$ for Pulkovo and $PR_2 - PR_1$ for Kucino are both 2m. 32s., and it does not seem possible to associate this interval with either of these designations at any reasonable value of Δ. But it is very suitable for $PR_2 - PR_1$ in both cases; and we can re-assign the readings as follows :—

	Δ	PR_1	O−C.	PR_2	O−C.	PR_3	O−C.
	°	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.
Pulkovo	135·2	20 15	−1 47	23 45	−1 56	26 17	−1 55
Kucino	136·5	20 16	−1 55	23 34	−2 18	26 6	−2 19

It is thus suggested that shock A must be nearly 2 minutes earlier; though the adopted tables are not sufficiently accurate to give the interval with precision. An interval of 2m. would increase the P reading for Riverview to 9m. 21s., corresponding to a distance $\Delta = 52°$; or if we assume the reading to be PR_1, to $\Delta = 40°$. Some further compromise is suggested, and the solution given above is the result of various trials. It is referred to an old epicentre, but there are various indications that it is not wholly satisfactory, especially the readings of Manila and Hong Kong. The readings used for shock B are given in italics to show their discordance.

We will now give the additional readings to above shock A, some of which may apply to shocks B and C: Riverview MN = +15·3m., iPR_1 = +9m.58s., PR_2 = +10m.21s. Batavia i = +11m.17s. and +19m.45s. Perth i = +17m.28s.; all readings having been increased by 19m. Victoria PN = +22m.42s. La Paz P = +18m.12s. (entered for shock B as PR_1). Ottawa eN = +5m.55s., +15m.58s., iN = +30m.44s. Ekaterinburg i = +22m.41s., +24m.51s., +29m.52s., and +36m.30s., e = +39m.35s. Pulkovo and Kucino, see above for PR_2 and PR_3. De Bilt eE = +41m.40s. and +51m.28s., eN = +55m.28s.

Dec. 26d. 23h. 32m. 43s. Epicentre 32°·0S. 173°·0W.

A = −·842, B = −·103, C = −·530; D = −·122, E = +·993; G = +·526, H = +·065, K = −·848.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington	13·5	223	i 3 21	+ 1	i 5 58	+ 2	6·5	13·5
Suva	15·9	330	(i 3 2)	−49	i 3 2	?P	—	—
Riverview	30·3	254	—	—	e 11 36	− 3	—	—
Batavia	78·4	270	11 43	−26	—	—	—	—
La Paz	93·4	112	16 49	?PR_1	—	—	—	—

Dec. 26d. 23h. 40m. 30s. Epicentre 14°·0N. 109°·0E.

A = −·316, B = +·917, C = +·242; D = +·946, E = +·326; G = −·079, H = +·229, K = −·970.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hong Kong	9·6	30	2 35	+11	—	—	—	—
Manila	11·6	86	e 1 46	−67	—	—	i 10·3	—
Batavia	20·3	186	3 56	−49	—	—	—	—
Hyderabad	29·6	281	9 15	+172	14 30	+183	—	—
Bombay	35·0	282	—	—	14 53	?SR_1	—	—
Irkutsk	38·4	355	e 7 47	+ 6	i 13 53	+ 9	19·5	—
Ekaterinburg	56·3	330	9 37	−11	17 19	−19	32·5	—
Kucino	67·8	325	e 12 29	+86	e 22 46	+166	38·4	38·9
Pulkovo	72·3	329	12 28	+56	21 46	+52	35·5	—
Strasbourg	86·8	320	i 13 30	+32	—	—	—	—
De Bilt z.	87·2	323	i 12 57	− 3	—	—	—	—
Moncalieri	87·9	316	e 13 3	− 1	21 20	−151	31·4	—

Dec. 26d. Readings also at 0h. (Algiers), 1h. (Hong Kong and Stonyhurst), 2h. (near Tacubaya), 5h. (Nagoya, near Osaka and Kobe), 6h. (La Paz), 8h. and 10h. (Manila), 12h. (Apia and near Tacubaya), 13h. (Taihoku), 16h. (Mizusawa and near Tacubaya), 20h. (Melbourne), 23h. (Irkutsk and near Granada).

1924. Dec. 27d. 11h. 22m. 0s. Epicentre 45°·0N. 143°·0E.

A = −·565, B = +·426, C = +·707 ; D = +·602, E = +·799 ;
G = −·565, H = +·426, K = −·707.

A depth of focus 0·010 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		+0·2	1·7	354	0 59	+30	(0 59)	+ 6	1·6	2·4
Sapporo		+0·2	2·2	211	0 58	+21	(0 58)	− 8	1·6	—
Mizusawa		0·0	6·0	194	1 33	+ 1	2 34	−10	—	—
Nagoya		−0·1	10·8	207	2 33	− 7	—	—	5·0	5·1
Kobe		−0·1	11·9	213	2 57	+ 1	e 4 17	−57	5·4	6·3
Osaka		−0·1	12·0	212	3 1	+ 3	(5 14)	− 3	5·2	6·7
Nagasaki		−0·2	15·9	224	3 44	− 4	(6 46)	− 2	6·8	7·4
Zi-ka-wei		−0·4	21·7	238	i 5 1	+ 4	i 8 58	+ 8	14·0	17·0
Irkutsk		−0·6	26·3	300	5 44	− 1	i 9 21	−55	15·0	—
Taihoku		−0·6	26·4	228	6 8	+22	(10 42)	+24	10·7	—
Hong Kong		−0·8	32·7	235	6 30	−16	(12 40)	+33	12·7	—
Manila		−0·8	35·6	220	i 6 57	−14	i 10 35	?	i 12·0	14·6
Calcutta	E.	−1·0	49·6	264	9 1	+ 3	16 3	+ 2	—	—
	N.	−1·0	49·6	264	9 2	+ 4	15 52	+ 9	—	—
Ekaterinburg		−1·0	50·0	316	i 9 5	+ 5	i 16 14	+ 8	22·0	36·3
Simla		−1·0	52·2	279	9 12	− 2	16 42	+ 8	—	—
Honolulu		−1·1	53·4	96	—	—	17 10	+22	21·0	—
Hyderabad		−1·2	59·9	267	10 7	+ 4	18 12	+ 5	28·8	40·2
Batavia		−1·2	60·6	224	i 10 6	− 2	—	—	—	—
Kucino		−1·2	61·3	322	i 10 19	+ 6	i 18 35	+11	31·4	34·4
Pulkovo		−1·2	61·8	330	i 10 19	+ 3	i 18 39	+ 8	25·5	32·1
Bombay		−1·2	62·9	271	10 26	+ 3	18 58	+14	33·9	—
Kodaikanal		−1·2	65·6	262	18 42	?S	(18 42)	−36	19·7	20·2
Upsala		−1·2	65·8	335	e 10 47	+ 5	i 19 30	+10	—	40·8
Colombo		−1·2	66·3	257	11 0?	+14	(21 50)	+144	—	45·8
Baku		−1·3	67·8	303	i 10 50	− 5	i 19 25	−19	31·9	43·4
Konigsberg		−1·3	68·9	330	i 11 6	+ 4	20 7	+10	—	36·4
Breslau		−1·3	73·3	329	e 12 0?	+30	e 21 30	+40	e 34·0	42·0
Hamburg		−1·3	73·7	334	i 11 36	+ 4	i 21 1	+ 6	e 35·0	—
Budapest		−1·3	75·3	323	e 12 0?	+18	e 21 30	+16	e 34·0	38·8
Eskdalemuir		−1·3	75·7	342	—	—	i 21 30?	+11	—	—
Vienna		−1·3	75·8	325	e 11 48	+ 2	i 21 28	+ 8	—	—
De Bilt		−1·3	76·4	336	i 11 52	+ 2	i 21 32	+ 5	e 37·0	42·8
Stonyhurst		−1·3	76·8	340	18 0	?	—	—	—	—
Ksara	E.	−1·3	77·3	306	12 0	+ 5	i 21 47	+10	32·8	—
	N.	−1·3	77·3	306	12 3	+ 8	21 49	+12	—	—
Uccle		−1·3	77·7	336	11 59	+ 2	i 21 44	+ 2	e 37·0	43·0
Innsbruck		−1·3	78·4	330	i 12 4	+ 2	e 21 54	+ 4	e 37·0	—
Oxford		−1·3	78·5	339	—	—	i 21 52	+ 1	—	—
Strasbourg		−1·3	78·6	333	e 11 53	−10	—	—	—	—
Riverview		−1·3	79·2	174	e 12 20	+14	e 21 50	− 9	e 34·1	35·2
Zurich		−1·3	79·4	331	e 12 6	− 2	e 22 2	+ 1	—	—
Venice		−1·3	79·6	329	e 12 0?	− 9	—	—	—	24·0?
Paris		−1·3	80·1	336	e 12 11	− 1	i 22 9	− 1	40·0	45·0
Athens	N.	−1·3	80·7	316	12 22	+ 7	i 22 32	+16	—	—
Perth		−1·3	80·8	203	e 15 47	?PR_1	—	—	—	—
Moncalieri		−1·3	81·8	330	i 12 39	+17	i 22 41	+12	40·2	50·1
Chicago		−1·3	82·1	37	11 59	−25	21 59	−34	37·2	—
Rocca di Papa		−1·4	82·6	325	i 12 25	− 1	22 35	− 2	e 34·4	56·7
Pompeii		−1·4	82·6	324	e 12 25	− 1	i 22 40	+ 3	—	—
Helwan		−1·4	82·8	306	12 24	− 3	(22 45)	+ 6	—	22·8
Ann Arbor		−1·4	83·3	34	e 12 18	−12	i 22 24	[−12]	37·7	56·6
Ottawa		−1·4	83·4	26	i 12 18	−12	i 22 23	[−14]	e 37·5	50·0
Toronto		−1·4	83·7	30	i 12 15	−17	22 25	[−14]	34·7	46·5
Barcelona		−1·4	86·8	332	—	—	23 15	− 8	e 35·8	—
Tortosa	N.	−1·4	87·9	334	12 51	− 5	23 4	[− 2]	e 42·0	53·7
Fordham		−1·4	88·1	28	i 12 48	− 9	(22 33)	[−34]	22·6	23·4
Georgetown		−1·4	88·7	30	i 12 42	−19	e 22 46	[−24]	e 38·1	—
Toledo		−1·4	90·2	335	12 58	−11	i 23 44	−17	e 40·4	49·5
Wellington		−1·4	90·8	157	e 16 15	?PR_1	(e 23 20)	[−13]	23·3	—
Almeria		−1·4	92·4	334	12 47	−34	i 23 27	[−17]	49·2	53·8
Granada		−1·4	92·5	335	e 13 19	− 3	i 24 10	−15	e 48·5	59·8
Malaga		−1·4	93·2	335	13 11	−15	24 1	−32	e 39·2	49·4
San Fernando		−1·4	93·9	337	—	—	23 45	[− 6]	52·0	58·0
Tacubaya		−1·4	94·4	58	13 6	−26	20 17	?	—	—
La Paz		—	141·4	52	i 19 20	[−22]	32 45	?	—	—

For Notes see next page.

NOTES TO DEC. 27d. 11h. 22m. 0s.

Additional readings and notes: Kobe MN = +5·7m. Osaka MN = +7·1m. Zi-ka-wei PR_1N = +5m.34s., PR_1E = +5m.36s., SR_1E = +9m.58s., SR_1N = +10m.2s., LN = +14·4m. Manila MN = +14·3m. Ekaterinburg i = +11m.32s., iSR_1 = +18m.38s., iSR_2 = +19m.48s., MN = +30·2m., MZ = +36·1m. Honolulu eN = +11m.0s.? eE = +16m.12s. Batavia i = +10m.42s., +14m.0s., and +16m.6s. Kucino e = +19m.55s. and +21m.6s., SR_2 = +25m.35s., MN = +42·6m. Pulkovo PS = +19m.37s., MN = +31·2m. Upsala MN = +35·9m. Konigsberg +20m.24s. Budapest MN = +42·0m. Vienna iPZ = +11m.51s., iZ = +12m.23s., PS = +22m.18s., iE = +22m.42s. De Bilt e = +31m.36s., MN = +42·0m. Ksara PR_1E = +14m.32s.; T_0 = 11h.22m.0s. Strasbourg i = +11m.56s., e = +12m.35s. Riverview MN = +36·4m. Paris MN = +47·0m. Rocca di Papa eLE = +30·8m., eLN = +32·8m. Ann Arbor PR_1 = +15m.30s., SR_1 = +27m.54s., SR_2 = +31m.6s. Ottawa SR_2N = +31m.53s. LN = +45·0m.; T_0 = 11h.22m.10s. Toronto LN = +35·4m., MN = +47·1m.; T_0 = 11h.22m.2s. Tortosa PE = +12m.49s. (O − C = −7s.). Georgetown SR_1 = +23m.22s. Toledo i = +23m.50s., MNW = +49·3m. Wellington i = +17m.10s. Malaga SR_1 = +28m.6s. La Paz PR_1 = +23m.55s.; T_0 = 11h.22m.9s.

Dec. 27d. Readings also at 2h. (near Taihoku), 8h. (Melbourne), 9h. (La Paz), 12h. (near Taihoku), 13h. (Taihoku and Toledo), 21h. (Wellington), 23h. (Wellington, Riverview, Malabar, and Perth).

1924. Dec. 28d. 22h. 54m. 52s. Epicentre 43°·2N. 147°·2E.

A = −·613, B = +·395, C = +·685; D = +·542, E = +·841; G = −·575, H = +·371, K = −·729.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sapporo		4·3	270	1 14	+ 7	(1 52)	− 6	1·9	—
Ootomari		4·7	319	1 18	+ 5	(1 51)	−18	1·8	2·7
Mizusawa		6·2	230	1 41	+ 6	2 43	− 6	—	—
Nagoya		11·3	228	2 37	−12	(5 2)	0	5·0	7·4
Osaka		12·5	231	3 2	− 4	(5 17)	−15	5·3	7·2
Kobe		12·7	232	3 9	0	6 41	+64	8·1	8·5
Nagasaki		17·2	238	3 48	−19	—	—	8·6	11·2
Zi-ka-wei		23·6	248	i 5 28	+ 4	9 41	+ 5	—	15·2
Taihoku		27·8	238	6 4	− 2	10 58	+ 3	15·4	15·9
Irkutsk		29·8	303	i 6 10	−16	i 11 14	−17	15·1	—
Hong Kong		34·4	242	6 55	−13	(12 30)	−16	12·5	19·5
Manila		36·4	226	i 7 16	− 9	i 14 30	+74	i 22·6	28·1
Sitka	E.	48·6	45	8 57	− 1	e 16 12	+11	23·4	30·9
	N.	48·6	45	—	—	e 16 23	+22	25·2	30·9
Honolulu		50·1	98	—	—	i 16 25	+ 5	23·1	24·5
Calcutta	E.	52·4	268	9 29	+ 7	17 0	+11	—	—
	N.	52·4	268	9 18	− 4	16 42	− 7	—	—
Ekaterinburg		53·3	318	i 9 28	0	i 16 54	− 6	25·1	34·1
Simla	E.	55·5	282	9 38	− 5	17 32	+ 4	27·2	35·6
	N.	55·5	282	9 44	+ 1	17 32	+ 4	27·2	35·2
Victoria	E.	58·9	51	13 54	?PR_1	17 18	−52	24·4	30·4
	N.	58·9	51	—	—	18 36	+26	25·7	30·9
Batavia		61·4	228	i 10 23	+ 2	i 18 35	− 6	29·6	32·6
Hyderabad		62·8	270	10 33	+ 2	19 3	+ 5	40·1	45·7
Pulkovo		64·8	330	10 49	+ 5	19 22	− 1	—	39·4
Berkeley	Z.	65·5	60	i 10 51	+ 3	e 19 42	+11	e 30·5	—
Bombay		66·0	274	10 51	0	19 40	+ 3	34·5	42·4
Baku		68·1	306	e 11 10	+ 5	i 20 9	+ 6	32·1	—
Kodaikanal		68·3	265	20 20	?S	(20 20)	+14	48·0	51·1
Apia		68·3	136	—	—	—	—	—	37·1
Colombo		68·9	260	10 28	−42	—	—	41·6	46·4
Upsala		69·0	336	e 11 11	0	—	—	e 31·1	44·8
Bergen		71·8	341	e 15 8	?PR_1	—	—	—	—
Konigsberg		72·0	330	11 32	+ 2	e 21 2	+12	e 32·5	36·6
Lemberg		74·6	326	e 11 44	− 2	e 21 14	− 7	e 42·9	46·6
Tucson	E.	76·2	59	—	—	21 54	[− 4]	e 36·4	42·2
Breslau		76·4	330	e 12 8	+11	e 22 8	[+ 9]	36·1	49·6
Hamburg		76·5	335	i 11 59	+ 1	21 43	0	e 36·1	48·1
Riverview		77·2	177	e 12 15	+13	e 21 50	− 1	e 32·4	39·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sydney		77·2	177	9 20	−162	21 50	− 1	39·6	46·2
Edinburgh		77·8	345	—	—	—	—	—	45·1
Budapest		78·5	328	e 12 8	− 2	e 22 8	+ 2	e 26·1	49·6
Adelaide		78·6	187	—	—	22 8	+ 1	e 48·8	55·3
Vienna		78·9	330	e 12 10	− 2	22 24	+13	e 37·1	50·1
De Bilt		79·2	338	i 12 19	+ 5	22 27	+13	e 37·1	42·9
Stonyhurst		79·5	343	—	—	—	—	29·1?	50·8
Belgrade		80·1	325	i 12 20	0	i 22 44	+20	e 40·5	45·1
Perth		80·5	207	12 17	− 5	22 23	− 6	38·5	—
Uccle		80·6	338	i 12 20	− 3	22 30	0	36·1	42·6
Ksara	E.	80·8	309	12 22	− 2	22 30	− 3	42·1	54·1
Melbourne		81·1	182	—	—	22 26	−10	34·7	50·7
Oxford		81·2	341	—	—	—	—	44·1	—
Kew		81·2	341	—	—	—	—	—	64·1
Innsbruck		81·5	331	i 12 26	− 2	e 22 34	− 7	e 37·1	—
Strasbourg		81·6	334	e 12 25	− 3	—	—	41·1	—
Zurich		82·4	333	e 12 28	− 4	i 22 42	− 8	—	—
Venice		82·7	330	e 13 8?	+34	—	—	—	—
Paris		82·9	338	e 12 35	0	e 22 50	− 6	38·1	46·1
St. Louis	E.	83·1	41	—	—	i 22 50	− 8	e 39·1	49·1
	N.	83·1	41	e 12 41	+ 4	e 22 55	− 3	—	46·1
Ann Arbor		83·1	35	e 12 32	− 5	i 23 14	+16	e 42·5	54·3
Besançon		83·4	334	e 12 43	+ 5	—	—	41·1	50·1
Ottawa		83·6	28	e 12 30	−10	i 22 53	[+ 6]	e 36·4	48·6
Toronto	E.	83·7	31	e 12 20	−20	i 22 55	[+ 7]	34·9	47·3
	N.	83·7	31	—	—	i 23 8	+ 2	31·6	47·4
Athens		84·2	319	e 11 20	−83	i 22 38	[−13]	e 32·3	—
Florence		84·6	329	12 18	−28	23 13	− 2	29·6	43·6
Moncalieri		84·8	333	13 10	+23	23 49	+32	34·4	59·7
Rocca di Papa		85·8	328	e 12 48	− 4	e 23 32	+ 4	e 33·5	57·5
Pompeii		85·8	326	e 13 8	+16	e 23 39	+11	—	—
Helwan		86·3	309	12 48	− 7	(23 38)	+ 5	—	23·6
Harvard	E.	87·8	27	—	—	23 52	+ 2	48·1	50·5
Wellington		88·1	160	e 13 0	− 6	i 23 49	− 4	42·5	45·1
Fordham		88·1	30	i 13 2	− 4	i 23 27	[+12]	43·2	57·7
Georgetown		88·6	33	e 12 8?	−60	23 46	−13	e 42·8	—
Cheltenham	E.	88·9	33	—	—	23 46	−16	e 41·2	54·1
	N.	88·9	33	—	—	24 7	+ 5	e 50·3	51·3
Barcelona		89·7	334	e 13 19	+ 5	e 23 55	−16	e 41·9	55·5
Tortosa		90·7	336	e 24 8?	?S	(e 24 8?)	−13	e 43·1	55·8
Tacubaya	E.	92·7	60	12 30?	−61	24 34	− 8	—	—
	N.	92·7	60	12 35	−56	24 25	−17	—	—
Toledo		93·0	339	13 21	−11	e 24 24	−21	e 40·7	58·2
Algiers		93·6	331	e 13 21	−15	24 14	[+24]	e 47·1	57·1
Almeria		95·2	337	13 6	−38	24 1	[+ 3]	49·4	51·9
Granada		95·3	338	e 13 34	−11	e 25 10	+ 1	e 44·9	53·6
Rio Tinto		95·6	340	26 8	?S	(26 8)	+56	—	63·1
Malaga		96·0	337	12 36	−73	e 24 18	[+15]	e 40·7	51·8
San Fernando		96·7	340	5 53	?	24 38	[+32]	51·1	56·6
Cape Town		139·5	265	23 14	?PR_1	—	—	—	83·2
La Paz		139·8	60	19 43	[+ 4]	33 47	?	66·7	86·9
Rio de Janeiro		157·9	26	e 20 16	[+10]	—	—	e 43·1	—
La Plata	E.	158·9	75	20 18	[+11]	30 29	?	76·0	79·0

Additional readings and notes: Nagoya MN = +6·6m. Kobe MN = +8·3m. Zi-ka-wei SR_1E = +10m.1s., SR_1N = +10m.23s. Taihoku MN = +17·1m. Manila MN = +26·7m. Sitka PR_1E = +10m.57s.; T_e = 22h.54m.43s. Honolulu eE = +17m.8s., SR_1N = +20m.34s., SR_1E = +20m.48s., LN = +23·0m., MN = +24·4m.; T_e = 22h.54m.18s. Calcutta readings are given for 29d. Ekaterinburg i = +21m.10s., MZ = +34·1m., MN = +35·5m. Berkeley iPN = +11m.0s., iPE = +11m.5s., PR_1E = +13m.43s., eLE = +30·2m., eLN = +30·3m. Baku iP = +11m.12s. Upsala MN = +45·8m. Konigsberg MN = +41·6m., MZ = +43·1m. Lemberg MN = +46·5m.; all readings given for 27d. Riverview eS = +22m.3s., eSR_1 = +26m.11s., eSR_2 = +27m.23s., eSR_3 = +28m.5s., MN = +39·1m. Eskdalemuir (Δ = 78°·3) gives simply 23h. Adelaide SR_1 = +26m.38s., e = +45m.8s. Vienna PS = +23m.3s., PPS = +23m.33s., iE = +27m.5s., and +29m.45s. De Bilt eSR_1 = +28m.33s., eLN = +38·1m., MZ = +52·3m., MN = +53·2m. Belgrade gives several PR and SR readings, also MN = +54·5m., the whole set having been diminished by 1h. to suit this earthquake. Uccle SR_1 = +28m.50s., MN = +47·6m. Ksara LN = +29·1m., MN = +52·1m.; T_e = 22h.54m.49s. Strasbourg i = +12m.33s. Zurich iP = +12m.32s. St Louis PR_1E = +16m.0s., PR_2N = +17m.43s., PSE = +23m.45s., PSN = +23m.54s., SR_1N = +28m.17s.

Continued on next page.

Ann Arbor $PR_1 = +16$m.14s., $MN = +53{\cdot}5$m. Ottawa $eSR_1 = +29$m.31s., $eLN = +38{\cdot}1$m., $MN = +49{\cdot}6$m.; $T_e = 22$h.54m.57s. Toronto $iSE = +23$m.11s., $iSN = +23$m.16s.; $T_e = 22$h.54m.34s. Rocca di Papa $iP = +12$m.53s. Harvard $S_cP_cSN? = +23$m.28s., $SR_1N = +30$m.12s., $eN = +38$m.24s., $eE = +38$m.27s., $LN = +44{\cdot}2$m., $MN = +51{\cdot}7$m.; $T_e = 22$h.54m.20s. Wellington $PR_1 = +16$m.35s., $PR_2 = +18$m.58s., $S_cP_cS = +22$m.49s., $SR_1 = +29$m.48s., $SR_2 = +33$m.8s., $e = +35$m.38s.; $T_e = 22$h.54m.45s. Fordham $SR_1 = +32$m.17s. Barcelona $MN = +57{\cdot}1$m. Toledo $iNE = +24$m.45s., $iNW = +24$m.46s., $MNW = +57{\cdot}9$m. Granada $i = +13$m.58s., $MN = +56{\cdot}5$m. Almeria $MN = +59{\cdot}2$m. Malaga $MN = +57{\cdot}1$m. San Fernando $SR_1 = +26$m.39s., $MN = +61{\cdot}6$m. La Paz $PR_1 = +23$m.53s., $SR_1 = +39$m.0s., $L = +60{\cdot}3$m.; $T_e = 22$h.54m.42s. La Plata $MN = +86{\cdot}9$m.

Dec. 28d. Readings also at 3h. (Bidston), 4h. (near Berkeley and Lick), 6h. (Rocca di Papa), 11h. (Granada), 17h. (La Paz), 19h. (near Manila), 23h. (Batavia and near Mizusawa).

Dec. 29d. 1h. 11m. 0s. Epicentre 43°·2N. 147°·2E. (as on 28d.).

		Δ	Az.	P.	O−C.	S.	P−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sapporo		4·3	270	1 39	+32	(1 39)	−19	2·3	—
Mizusawa	E.	6·2	230	1 34	− 1	2 36	−13	—	—
	N.	6·2	230	1 39	+ 4	2 37	−12	—	—
Osaka		12·5	231	3 45	+39	—	—	6·5	8·7
Zi-ka-wei		23·6	248	5 16	− 8	9 47	+11	—	14·8
Ekaterinburg		53·3	318	—	—	—	—	27·0	34·9
Kodaikanal		68·3	265	22 6	?	—	—	—	—

Osaka gives also $MN = +7{\cdot}3$m.

Dec. 29d. Readings also at 1h. (Mizusawa), 4h. (Strasbourg and near Zurich), 7h. (near Lick), 9h. (near Athens), 12h. (Nagoya and near Mizusawa), 17h. (Chicago).

Dec. 30d. Readings at 1h. (near Tacubaya), 2h. (near Vera Cruz), 3h. (Ottawa, Toronto, Fordham, near Merida, and Tacubaya), 4h. (Taihoku). 7h. (near Berkeley), 8h. (Nagasaki), 10h. (Adelaide), 12h. (Fordham, Tacubaya, and near Osaka), 13h. (Ann Arbor, Victoria, Toronto, and Ottawa), 14h. (Perth, Batavia, Melbourne, Manila, Sydney, and Riverview), 15h. (Ottawa, Chicago, Batavia, Riverview, Sydney, and near Apia), 16h. (Toronto, Victoria, Ekaterinburg, and near Mizusawa), 17h. (Ekaterinburg), 19h. (near Batavia and Malabar).

Dec. 31d. 4h. 40m. 30s. Epicentre 51°·0N. 141°·0E. (as on 1922 Jan. 24d.).

$A = -{\cdot}489$, $B = +{\cdot}396$, $C = +{\cdot}777$.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	4·5	e 1 13	+ 3	(2 12)	+ 8	2·2	—
Mizusawa	11·9	2 54	− 4	5 10	− 7	—	—
Osaka	16·8	4 2	0	(7 39)	+26	7·6	8·4

Additional readings: Mizusawa $SN = +5$m.13s. Osaka $MN = +8{\cdot}0$m.

Dec. 31d. Readings also at 0h. (Rocca di Papa), 3h. (near Almeria and Malaga), 5h. and 7h. (near Tacubaya), 9h. (near Osaka and Kobe), 12h. (Nagasaki), 13h. (Apia), 14h. (Zi-ka-wei and near Taihoku), 15h. (Wellington, Zi-ka-wei, and Suva), 18h. (Rocca di Papa and near Batavia and Malabar), 19h. (Batavia and Perth).

POSSIBLE ALTERNATIVE SOLUTION: See p. 244.

Oct. 25d. 19h. 8m. 50s. Epicentre 50°·0N. 28°·0W.

A = +·568, B = −·302, C = +·766.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Eskdalemuir	15·8	—	—	9 10	+142	e 15·2	—
Uccle	20·5	—	—	e 8 31	− 3	e 15·2	—
San Fernando	20·7	4 52	+ 3	8 28	−10	12·9	13·2
De Bilt	20·8	—	—	e 8 55	+15	e 17·2	21·2
Granada	21·7	e 5 34	+33	i 9 34	+35	e 15·0	17·2
Moncalieri	24·4	e 2 53	−159	12 31	+159	18·6	—
Ottawa	31·9	e 11 46	+300	e 17 6	+299	e 21·7	—
Toronto	35·0	11 10	?	—	—	15·4	—
Kucino	38·7	—	—	e 15 28	+100	26·4	—
Ekaterinburg	49·5	—	—	e 43 44	?	55·2	—
Bombay	82·4	—	—	24 10?	+80	—	—

Constants for New Stations (Mar., 1928).

(LAST LIST NOV., 1925. SEE SUMMARY FOR 1922, p. 48.)

			a	b	c
Agana (Guam)	13°28′N.	144°45′E.	−·794	+·561	+·233
Cheb	50° 5′N.	12°23′E.	+·627	+·138	+·767
Copenhagen	55°41′N.	12°27′E.	+·550	+·121	+·826
Entebbe	0° 4′N.	32°28′E.	+·844	+·537	+·001
Frankfurt (Feldberg)	50°13′N.	8°27′E.	+·633	+·094	+·768
Grenoble	45°10′N.	5°45′E.	+·701	+·070	+·710
Ivigtut	61°12′N.	48°11′W.	+·321	−·359	+·876
Jugenheim	49°42′N.	8°36′E.	+·639	+·097	+·763
Kucino	55°45′N.	37°58′E.	+·444	+·346	+·827
La Plata	34°55′S.	57°56′W.	+·436	−·695	−·572
Leningrad	59°57′N.	30°18′E.	+·432	+·252	+·866
Ljubljana	46° 3′N.	14°31′E.	+·672	+·174	+·720
Loyola	29°57′N.	90° 7′W.	−·002	−·867	+·499
Manzanillo	19° 3′N.	104°20′W.	−·234	−·916	+·326
Nordlingen	48°45′N.	10°30′E.	+·647	+·120	+·753
Piatigorsk	44° 2′N.	43° 4′E.	+·525	+·491	+·695
Potsdam	52°23′N.	13° 4′E.	+·595	+·138	+·792
Prague	50° 4′N.	14°26′E.	+·622	+·160	+·767
Ravensburg	47°47′N.	9°37′E.	+·662	+·112	+·741
Sendai	38°17′N.	140°52′E.	−·609	+·496	+·619
Sofia	42°40′N.	23°20′E.	+·675	+·291	+·678
Ste. Anne	47°21′N.	70° 2′W.	+·231	−·637	+·736
Scoresby Sund	70°29′N.	21°57′W.	+·310	−·125	+·943
Spokane	47°39′N.	117°28′W.	−·311	−·598	+·739
Sucre	19° 3′S.	65°16′W.	+·396	−·859	−·326
Suva (Fiji)	18° 6′S.	178°24′E.	−·950	+·027	−·311
Toyooka	35°32′N.	134°49′E.	−·574	+·577	+·582

TABLE.

Degrees.	P sec.	S sec.	S − P sec.	Degrees.	P sec.	S sec.	S − P sec.	Degrees.	P sec.	S sec.	S − P sec.
1	15	28	13	51	553	991	438	101	855	1565	710
2	31	55	24	52	560	1004	444	102	860	1575	715
3	47	83	36	53	566	1016	450	103	865	1584	719
4	62	110	48	54	573	1029	456	104	870	1593	723
5	77	137	60	55	579	1041	462	105	874	1602	728
6	92	164	72	56	586	1054	468	106	879	1612	733
7	106	190	84	57	592	1066	474	107	884	1621	737
8	121	217	96	58	599	1079	480	108	888	1630	742
9	136	243	107	59	605	1091	486	109	893	1639	746
10	150	269	119	60	612	1103	491	110	897	1648	751
11	164	294	130	61	619	1116	497	111	902	1657	755
12	179	319	140	62	625	1128	503	112	907	1666	759
13	193	344	151	63	632	1141	509	113	911	1674	763
14	206	368	162	64	638	1153	515	114	916	1682	766
15	219	392	173	65	645	1165	520	115	920	1690	770
16	232	415	183	66	651	1177	526	116	925	1698	773
17	245	438	193	67	658	1190	532	117	929	1706	777
18	257	460	203	68	664	1202	538	118	934	1714	780
19	269	482	213	69	671	1214	543	119	938	1722	784
20	281	503	222	70	677	1226	549	120	942	1729	787
21	293	524	231	71	683	1238	555	121	947	1737	790
22	305	545	240	72	690	1250	560	122	952	1744	792
23	317	565	248	73	696	1262	566	123	957	1752	795
24	328	584	256	74	702	1274	572	124	961	1759	798
25	338	603	265	75	709	1286	577	125	966	1766	800
26	348	622	274	76	715	1297	582	126	970	1773	803
27	358	641	283	77	721	1309	588	127	974	1780	806
28	368	659	291	78	727	1320	593	128	978	1787	809
29	378	677	299	79	733	1332	599	129	983	1794	811
30	388	694	306	80	739	1343	604	130	988	1801	813
31	398	711	313	81	745	1355	610	131	992	1807	815
32	407	728	321	82	750	1366	616	132	996	1814	818
33	416	744	328	83	756	1377	621	133	1001	1821	820
34	425	760	335	84	762	1388	626	134	1005	1827	822
35	433	775	342	85	768	1399	631	135	1009	1833	824
36	442	790	348	86	773	1410	637	136	1014	1840	826
37	450	804	354	87	779	1421	642	137	1018	1846	828
38	458	818	360	88	785	1432	647	138	1023	1852	829
39	466	832	366	89	790	1443	653	139	1027	1858	831
40	475	847	372	90	796	1454	658	140	1031	1864	833
41	483	861	378	91	801	1464	663	141	1035	1869	834
42	491	875	384	92	807	1475	668	142	1039	1875	836
43	498	888	390	93	812	1485	673	143	1043	1881	838
44	506	902	396	94	818	1496	678	144	1047	1886	839
45	513	915	402	95	823	1506	683	145	1051	1892	841
46	520	928	408	96	829	1516	687	146	1055	1897	842
47	527	941	414	97	834	1526	692	147	1059	1902	843
48	534	954	420	98	840	1536	696	148	1063	1907	844
49	540	966	426	99	845	1546	701	149	1067	1912	845
50	547	979	432	100	851	1556	705	150	1071	1917	846

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