The International Seismological Summary for 1923 April, May, June.

FORMERLY THE BULLETIN OF THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

Although arrears arising from the War are being steadily caught up (three months' results are published at two-month intervals) the date of publication is still more than three years behind; and it will not be easy to reduce this interval further unless *all* the observatories will send in their observations in good time. Most of them do, but there are a few which lag behind, and the pace is necessarily that of the slowest.

On the other hand some information is received almost at once, which it seems undesirable to withhold for three years until the earthquake is dealt with in the regular course. As an experiment a few brief notes on such recent earthquakes will be given in these introductions.

The Solomon Islands Earthquake of 1926 April 12.

By the kindness of the Colonial Secretary a copy of a report from the Resident Commissioner in the Solomon Islands dated April 20 has been received. He writes of a "very heavy earthquake shock at Kira Kira and neighbourhood on the 12th instant at 7.15 p.m. . . . The heaviest and longest shock I ever experienced." The quaking was so violent that he could not rise to his feet, but escaped from the house on his hands and knees. The quaking continued all night, and after-shocks had been frequent in the eight days up to the time of writing. Many houses in the neighbourhood were damaged. The natives remember a less severe shock some 15 years ago, and some of the old natives one 40 or 50 years ago.

In a later letter (dated May 30) it is stated that the Government Station "seems to have been about the centre of the disturbance, though at Messrs. Lever's Plantations on the Three Sisters' Islands, 12 miles away northerly, the damage was severe. There was no loss of life anywhere."

The Cretan Earthquake of 1926 June 26.

The name Cretan is used because of the conspicuous damage done in Crete, especially to the Candia Museum, as reported by Sir Arthur Evans in *The Times* of June 29. "In Candia itself only about 40 houses are actually down: two or three hundred are in a precarious condition. Thanks to the early hour of the earthquake, 9.45, there were no victims." As regards the Museum, masonry fell into the great hall, damaging the cases, especially those containing the frescoes from Knossos, but Sir Arthur expresses his hope that "much may ultimately be restored." The earthquake was, however, felt over a wide area. A letter from Mr. Curry, the Director of the Helwan observatory, dated October 5, states that it "was felt everywhere in Egypt except in Aswan, the most southerly province," and that "one building was completely destroyed, 15 partly destroyed, and a very large number cracked in all districts, the number in Cairo being given as 500, in Alexandria over 100. Eight people were reported killed and four wounded." A letter from Mr. Mills, dated from the Government Offices in Jersualem, testifies to the vibration of a house (on the Mount of Olives overlooking the Dead Sea) which "increased in intensity with every tremor." There were five or six tremors, each accompanied by a noise, which "at first resembled the exhaust of a high-powered car; subsequently it assumed a deeper and harsher note; it was always more definite than rumbling." In the morning there were found three new cracks in the walls of the house and a gap of nearly half an inch between its walls and the surrounding soil.

Owing to the occurrence of other earthquakes shortly afterwards this earthquake was reported as "peripatetic," and assumed to have travelled as far as Singapore.

The Director of the Athens Observatory assigns as epicentre

35°·8N. 25°·5E.

and T_0 may be put provisionally at June 26d. 19h. 46m. 20s. The Observatory at Vienna (Erdbebenwarte Wien, Hohe Warte Wien XIX) is undertaking a special study of this earthquake, and would be grateful for any readings or records communicated to them.

The British Earthquake of 1926 August 15.

Earthquakes in England are fortunately not frequent or serious; the shock noted by many people at about 5 a.m. summer time (4h. Greenwich time) on Sunday morning August 15 produced a large volume of correspondence, but caused no serious alarm. On my way to develop the Oxford Seismogram I was told of the

earthquake by a lady who had had former experience, so that after a moment's anxiety about burglars she had quickly recognised that it was " only an earthquake " and gone to sleep again. This mental attitude was sufficiently widespread to find its way into *Punch* for August 25. A few notes from letters and paragraphs received may be given here.

The epicentre was near Hereford and Ludlow, say 52°·4N. 2°·7W. A Hereford paper: " To nerves upset by the occurrence the sound of the public clocks in Hereford striking the hour as usual—this immediately followed the cessation of the noise—was soothing. (The time of the shock may be put provisionally at Aug. 15d. 3h. 58m. 20s.) . . . It is vouched for by men who had been engaged all night on work in the High Town, that the clock in the Market Hall tower was caused to strike thrice."

" All the pheasants woke up and began calling " (Woodstock, near Oxford: $\Delta=1°·0$).

" It was strong enough to set in motion pictures, doors, and crockery, which produced knocking sounds sufficiently loud to wake me, but I was not conscious of tremors, though I have often been wakened by tremors produced by heavy lorries on the Madingley Road 300 yards away."—(Prof. H. F. Newall, Cambridge: $\Delta=1°·8$).

" My daughter aged 20 was thrown out of bed."—(Market Harboro: $\Delta=1°·1$).

" Caused the pheasants to screech and the birds to call out. Shaking of my bed woke me up but no one else in the house was wakened."—(King's Lynn: $\Delta=1°·5$).

A distinct single shock to the house, and moving of beds, followed by creaking of doors and rattling of windows was felt at Craddock, near Tiverton, Devon ($\Delta=1°·6$).

The noise of the articles on the washstand and the shake woke three of us up and within five to seven seconds after the church clock struck five, and this is 25 secs. fast, so that the exact G.M.T. would be 3h.59m.40s.—(Thrapston: $\Delta=1°·3$).

Dr. C. Davison, of Cambridge, is editing this voluminous correspondence; he has received some 1300 letters.

The Azores Earthquake of 1926 August 31d. 10h. 40m. 0s.

Col. Chaves, the Director of Ponta Delgada, died on 1926 July 23. Sr. José Agostinho, who has been for some time in charge of the Milne Seismograph, and is at present Acting Director of the Meteorological Observatory, on hearing by cable from Horta of the earthquake, promptly visited Fayal and Pico, and under date September 19 sent us a preliminary note accompanied by a map, beautifully drawn in four colours, showing the regions damaged. The region of intensity VIII to X was chiefly round Horta, in Fayal, but there are also three points widely separated on the coast of the Island of Pico : that is to say, the destruction seems to be determined, in this as in other cases, partly by proximity to the epicentre and partly by the nature of the ground. The epicentre may be provisionally put at

38°·5N. 28°·6W.

He remarks that the damaged buildings were of poor construction, and at the time of the earthquake most people were out, so that the number of killed was but nine, and of hurt about 200. At a rough estimate 10 to 15 per cent. of the houses in Horta " have to be demolished." Cracks in soil were small (2in. wide). Sea rose 40 to 50 cm. in Horta, " according to people who were on the shore. Mareograph in Horta (stopped) shows rise less than 20cm. No tsunami reported in the other islands. No changes in the springs. No land slips : some material fallen from the cliffs. No remarkable subsidence or upheaval of the soil. Soundings not yet available."

Note on the Earthquake of 1922 September 23d. 0h.

For this earthquake an epicentre 40°·5N. 4°·0E. (near the Balearic Isles) was adopted in this Summary (see p. 156) ; but Dr. Fontseré of Barcelona has called attention to the fact that though the shock was felt in the N.E. of Spain and in Roussillon it was not felt in the Balearic Isles ; and he suggests the epicentre 43°·0N. 2°·0E., which is on the other side of the line running through Barcelona and Tortosa. We may compare the two alternatives by giving the residuals for P and S thus :

	Former Solution. 40°·5N. 4°·0E.			Fontseré. 43°·0N. 2°·0E.		
	Δ °	P. s.	S. s.	Δ	P. s.	S.
Barcelona	1·7	0	—	1·5	+ 3	—
Tortosa	2·6	+ 3	—	2·4	+ 7	—
Marseilles	3·0	− 5	−11	2·4	+ 5	+ 6
Puy de Dôme	5·4	−23	—	2·8	+16	—
Granada	6·8	?L	?	7·2	?S	(+28)
Besançon	6·8	?S	(−24)	5·0	?S	(+24)
Zurich	7·6	− 2 −22	+ 7	6·3	+17 − 3	+41
Strasbourg	8·5	—	− 4	6·8	—	+41
Uccle	10·3	+40	—	8·0	?S	(−23)

The second P for Zurich is given as eV ; it suits the second supposition closely.

Apart from the macroseismic evidence the former solution seems preferable, seeing that S is accordant for both Zurich and Strasbourg, whereas in the second solution we must presume that the readings really refer to L.

The question is thus raised how far the macroseismic evidence is decisive ; experience in other cases seems to leave it at least doutbful whether it should over-rule the evidence of the seismograms, as interpreted at the observatories ; for the present it seems best to draw attention to such cases without attempting a final decision.

If one or two changes in the seismograph readings be admitted, the epicentre of 1923 July 10, *viz.*, 42°·8N. 1°·0W., will suit the readings ; the changes being to treat the Marseilles S as P (ignoring the recorded P) and to assume an error of 1 min. in Uccle P.

In a later letter, dated August 20, Professor Fontseré agrees that the P and S residuals are better with the adopted epicentre near the Belearic Islands, but quite reasonably remarks that it is strange that no information of disturbance is even by that date forthcoming from those Islands.

The present number of the Summary deals with 104 epicentres, 44 of which are new, 60 repetitions from old epicentres.

There are two cases of possibly abnormal focus :—

On 1923 April 23d. 3h. 17m. 0s. a solution is first given without any such supposition ; the full discussion of the residuals gives a not very decided preference for a *height* of °030 *above* normal.

On 1923 June 29 the double earthquake at 10h. 47m. 38s. and 10h. 53m.20s. is also solved in the first instance with normal focus ; and the residuals for *some* stations (not all) favour a focal *depth* of °060 *below* normal.

As explained in the last number of the Summary, the notation [S] is used for the Gutenberg wave S_cP_cS which differs from S by $(80 - \Delta) \times 4{\cdot}6$ sec., where Δ is expressed in degrees. Several cases of [S] are noted on April 19d. 3h., May 1d. 10h. 4d. 16h., 4d. 22h. (a number of cases in good accord), June 1d. 17h. and 18h., June 18d. 8h. (a fine series of [P] also).

Attention may be drawn to the series of shocks from the epicentre 36°·0N. 142°·0E.

	Observed (O)			N.	C_1	$O-C_1$	$-C_2$	$O-C_1-C_2$
	d.	h.	m.		m.	m.	m.	m.
June	1	17	24·6	0	24·0	(+0·6)	—	—
	1	20	15·6	8	12·0	+3·6	− 2·7	+0·9
	2	0	47·0	21	45·0	+2·0	− 1·1	+0·9
	2	3	12·5	28	12·0	+0·5	− 0·3	+0·2
	2	4	53·8	33	57·0	−3·2	+ 0·3	+2·9
	2	21	58·2	82	64·0	−5·8	+ 6·1	+0·3
	4	4	39·8	172	33·0	+6·8	+16·6	+2·4
	4	18	52·3	210	54·0	−1·7	+21·2	−1·5
	5	2	7·1	231	15·0	−7·9	+23·7	−5·2
	6	17	36·5	343	27·0	+9·5	+36·9	+4·4
	12	16	49·6	753	57·0	−7·4	+85·2	−6·2
	15	11	8·8	942	6·0	+2·8	+107·6	+5·4
	16	13	5·5	1016	0·0	+5·5	+116·3	−4·2
	18	11	28·2	1149	33·0	−4·8	+113·9	+1·1
	19	7	1·2	1205	9·0	−7·8	+138·6	+4·8
	Sum.					±69·3		±40·4

Attention has been called to an apparent period near 21 minutes in these repetitions. The Column C, gives the minute at which a number of intervals N of exact length 21·0 minutes would recur. The column O−C, shows the residuals, which are at first small but afterwards larger, so that the mean numerical sum of all 14 (excluding the starting point) is ±69·3, or the mean ±4·95, which is very little less than ±5·25 which would be the mean value on the hypothesis of a chance distribution over the half period 10·5. It seems clear that a period close to 21·0 min. cannot be justified from these observations. But it seems possible that the period may not always be the same, though as yet we may not know the reason. Taking a hint from the first few observations let us apply the correction

$$-C_2 = -3{\cdot}6 + 0{\cdot}118N.$$

Then the residuals shown in the column $O-C_1$, $-C_2$ are considerably reduced, their numerical sum being now only ±40·4, and the mean ±2·9. There is thus good evidence for a period of 21−0·118 min.=20·882 min. at the time and place of these shocks. Possibly the period has previously been wrongly estimated.

H. H. TURNER.

University Observatory, Oxford.
1926 October 17.

1923 APRIL, MAY, & JUNE.

April 1d. Readings at 4h. (La Paz), 5h. (Ekaterinburg), 6h. and 8h. (2) (La Paz), 23h. (Nagasaki).

April 2d. Readings at 1h. (near Mostar), 5h. (Malabar and Batavia), 6h. (Nagasaki), 7h. (Algiers), 8h. (Nagasaki), 10h. (near Mizusawa), 14h. (Ekaterinburg), 15h. (Malabar), 17h. (near Manila), 20h. and 23h. (Nagasaki).

April 3d. 7h. 7m. 20s. Epicentre 38°·0N. 20°·5E. (as on 1921 Sept. 14d.).

A = +·738, B = +·276, C = +·616 ; D = +·350, E = −·937 ;
G = +·577, H = +·216, K = −·788.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	2·6	91	0 38	− 3	1 5	− 7	1·2	1·5
Pompeii	5·4	303	2 40	?S	(2 40)	+12	(5·7)	—
Belgrade	6·8	0	e 1 47	+ 3	e 2 26	−39	—	4·8
Rocca di Papa	7·0	305	i 1 42	− 4	—	—	—	5·4
Vienna	10·6	345	e 6 3	?	e 6 38	?	—	8·0
Innsbruck	11·4	327	e 2 52	+ 2	—	—	—	—
Hamburg	17·2	339	e 3 40	?	—	—	—	—
De Bilt z.	17·7	328	i 4 15	+ 2	—	—	—	—
Upsala	21·9	356	—	—	—	—	e 15·7	—

Additional readings: Athens gives also MN = +2·3m. Rocca di Papa iPE = +0m.54s.

April 3d. Readings also at 2h. (Nagasaki), 10h. (Hakodate, Rocca di Papa, and Apia), 12h. (Malabar), 13h. (Batavia), 14h. (Manila), 16h. (near Taihoku), 18h. (Nagasaki and Victoria), 19h. (La Paz).

April 4d. Readings at 0h. (Berkeley), 2h. (Nagasaki (2)), 5h. (Nagasaki and near Hakodate and Mizusawa), 7h. (Manila), 9h. (Nagasaki), 10h. (Simla and Ekaterinburg), 14h. (Algiers), 16h. (Lick), 18h. (Nagasaki).

April 5d. 22h. 9m. 40s. Epicentre 25°·0N. 121°·5E. (as on 1923 Jan. 2d.).

A = −·472, B = +·773, C = +·423 ; D = +·853, E = +·522 ;
G = −·221, H = +·360, K = −·906.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	0·1	22	0 5	+ 3	—	—	0·3	0·4
Hokoto	2·6	231	0 20	−21	—	—	e 0·7	—
Zi-ka-wei	6·2	359	1 20	−15	e 2 51	+ 2	—	3·8
Hong Kong	7·1	249	1 41	− 7	—	—	—	4·8
Manila	10·4	183	e 2 54	+18	—	—	—	—
Ekaterinburg	53·4	324	e 22 14	?SR_1	—	—	28·3	34·4
De Bilt	85·0	327	—	—	—	—	e 45·3	—
Strasbourg	85·6	323	—	—	—	—	e 47·3	—
Uccle	86·1	326	—	—	—	—	e 46·3	—
Eskdalemuir	86·8	333	—	—	—	—	e 44·3	—
Kew	88·0	329	—	—	—	—	—	57·3
Ottawa	107·9	13	—	—	—	—	e 50·3	—

Additional readings: Zi-ka-wei gives also MN = +4·0m. Ottawa L = +56·3m.

April 5d. Readings also at 3h. (Athens), 20h. (Malabar and Batavia), 21h. (Ekaterinburg and near Mizusawa).

April 6d. Readings at 1h. (La Paz), 2h. (Batavia), 6h. (Manila), 7h. (Azores) 8h. (La Paz), 13h. and 14h. (Ekaterinburg), 17h. and 18h. (Nagasaki).

April 7d. Readings at 3h. (Coimbra), 5h. (Cape Town), 6h. (near Mizusawa), 13h. (Osaka and Kobe), 21h. (Algiers).

April 8d. Readings at 2h. (Nagasaki), 11h. (Osaka and Kobe), 13h. (Nagasaki), 16h. (Ekaterinburg), 21h. (Manila).

April 9d. Readings at 4h. (Nagasaki), 6h. (Barcelona), 7h. (near Manila), 8h. (Hamburg and near Manila), 10h. (Nagasaki), 11h. (Simla), 13h. (Nagasaki (2) and Manila), 15h. (Azores), 16h. and 18h. (Taihoku), 19h. (La Paz).

April 10d. Readings at 4h. (Nagasaki), 5h. and 7h. (La Paz), 10h. (Sitka), 17h. (Manila), 18h. (Rio Tinto), 19h. (Ekaterinburg and Zi-ka-wei), 20h. (Hakodate).

April 11d. Readings at 4h. (Manila), 7h., 9h., and 11h. (Ekaterinburg), 12h. (near Mizusawa), 13h. (Malaga), 14h. (Athens and Zi-ka-wei), 20h. (Nagasaki), 21h. (La Plata), 23h. (Ekaterinburg).

April 12d. Readings at 1h. (Algiers), 4h. (Vienna), 7h. (Manila and La Paz), 11h. (near Manila and near Rocca di Papa), 15h. (Christchurch, Wellington (2), and La Paz), 17h. (La Paz).

April 13d. 2h. 26m. 30s. Epicentre 2°·0N. 96°·0E. (as on 1920 Mar. 17d.).

$A = -\cdot104$, $B = +\cdot994$, $C = +\cdot035$; $D = +\cdot995$, $E = +\cdot104$; $G = -\cdot004$, $H = +\cdot035$, $K = -\cdot999$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	13·6	127	3 23	+ 2	(i 4 44)	−74	i 7·7	9·5
Colombo	16·9	287	−0 30	?	—	—	—	11·5
Manila	27·7	62	6 25	+20	—	—	—	—
Ekaterinburg	61·6	340	e 10 58	+35	18 35	− 8	32·5	—
Vienna	81·6	320	12 26	− 2	22 34	− 8	—	—
Rocca di Papa	83·7	312	e 12 54	+14	—	—	—	—
La Paz	158·7	226	20 27	[+20]	—	—	—	—

Additional readings and notes: Batavia S and L readings given as i simply. Ekaterinburg gives also iPS = +19m.8s. Vienna iPZ = +12m.47s., SR_1 = +29m.1s. Rocca di Papa eE = +10m.54s.

April 13d. 10h. 3m. 5s. Epicentre 23°·5S. 178°·0E. (as on 1921 May 16d.).

$A = -\cdot916$, $B = +\cdot032$, $C = -\cdot399$; $D = +\cdot035$, $E = +\cdot999$; $G = +\cdot398$, $H = -\cdot014$, $K = -\cdot917$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		13·7	47	4 24	+62	—	—	—	7·0
Wellington		18·0	188	i 4 41	+24	(i 7 30)	−10	i 7·5	—
Riverview		25·6	240	e 5 50	+ 6	(i 10 8)	− 6	e 11·1	15·6
Sydney		25·6	240	5 7	−37	—	—	8·5	10·2
Melbourne		31·6	235	—	—	(i 11 25)	−36	13·9	14·7
Adelaide		36·0	243	8 55	+93	—	—	e 20·4	22·4
Honolulu		50·6	31	16 12	?S	(16 12)	−14	—	—
Manila		67·5	301	e 11 19	+18	—	—	—	—
Batavia		70·2	271	i 11 24	+ 6	i 19 49	−39	—	—
Victoria	E.	98·0	35	—	—	—	—	22·7	23·4
Colombo		100·2	272	24 37	?S	(24 37)	−81	—	—
La Paz		104·0	117	e 16 12	+102	23 52	?	28·9	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Chicago		108·6	52	e 23 45?	?	27 45	+30	—	—
Ottawa		117·7	49	—	—	—	—	e 33·0	—
Ekaterinburg		124·4	324	e 20 58	?PR_1	—	—	39·4	—
Upsala		141·2	344	e 19 29	[−12]	—	—	e 113·9	—
Edinburgh		147·6	1	e 19 55	[+ 3]	—	—	—	—
Hamburg		148·6	347	19 55	[+ 1]	—	—	—	—
Bidston		150·1	1	24 19	?	33 55	?	—	38·6
De Bilt		150·9	351	19 54	[− 3]	—	—	e 42·7	—
Vienna		151·3	334	19 54	[− 4]	28 14	?	—	—
Uccle		152·3	351	e 20 1	[+ 2]	—	—	—	—
Strasbourg		153·8	345	20 1	[0]	—	—	26·9	—
Innsbruck		153·9	339	e 20 3	[+ 2]	—	—	—	—
Zurich	N.	154·7	343	(i 20 36)	[+34]	i 20 36	?P	—	—
Moncalieri		157·1	342	e 20 11	[+ 6]	24 11	?PR_1	30·7	—
Pompeii		157·9	325	21 55	[+109]	—	—	—	—
Rocca di Papa		158·0	330	20 9	[+ 3]	—	—	—	—
Algiers		166·0	343	e 21 19	[+67]	29 15	?	51·9	—

Additional readings: Wellington gives true S as iL also i = +5m.47s., iS = +6m.40s., iL = +7·1m., T_e = 10h.5m.16s., also a second set of readings. Riverview gives S as iSR_1, also iS = +9m.31s., MN = +15·7m., also another set of readings. Melbourne gives iS as iSR_1, also S = +9m.49s. Adelaide e = +11m.55s. Batavia i = +12m.2s. Victoria LN = +22·8m. Ottawa e = +23m.21s., +24m.53s., and +30m.11s., L = +76·9m. and +116·9m. Ekaterinburg i = +22m.26s., e = +24m.10s. De Bilt eZ = +22m.15s., +23m.52s., and +26m.58s. Vienna iZ = +20m.19s. and +21m.21s., PR_1 = +22m.31s., e = +29m.47s. Rocca di Papa iN = +20m.52s. Algiers PR_1 = +25m.13s.

1923. April 13d. 15h. 30m. 54s. Epicentre 55°·7N. 162°·5E.

A = −·537, B = +·169, C = +·826; D = +·301, E = +·954; G = −·788, H = +·248, K = −·564.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		15·2	242	4 0	+18	—	—	7·8	9·0
Hakodate		19·9	235	5 12	+32	—	—	9·6	—
Mizusawa		21·8	230	4 57	− 6	9 2	+ 1	(10·9)	—
Nagoya		27·0	231	5 39	−19	—	—	13·3	14·5
Osaka		28·1	233	7 29	+80	—	—	12·2	15·6
Kobe		28·2	233	—	—	—	—	13·2	15·7
Nagasaki		32·3	238	7 17	+26	—	—	—	—
Sitka	E.	33·2	61	7 56	+58	e 12 5	−22	16·2	20·8
	N.	33·2	61	—	—	14 16	+109	18·1	18·8
Zi-ka-wei		37·7	246	e 8 9	+33	e 13 5	−29	—	17·1
Taihoku		42·7	241	—	—	—	—	25·3	25·5
Victoria	E.	43·9	68	8 17	− 8	14 47	−14	21·9	24·6
	N.	43·9	68	8 17	− 8	14 53	− 8	21·5	24·0
Honolulu	N.	45·1	123	8 36	+ 2	i 15 19	+ 3	21·3	23·0
Hong Kong		48·7	247	16 25	?S	(16 25)	+23	21·6	32·6
Ekaterinburg		51·1	317	9 11	− 3	—	—	23·1	39·0
Berkeley	E.	51·6	78	9 11	− 6	16 31	− 8	26·8	28·3
Manila		52·0	234	e 9 36	+16	17 6	+22	26·1	30·3
Upsala		61·1	341	i 10 12	− 8	18 32	− 5	e 29·1	36·9
Bergen		62·5	349	—	—	i 19 26	+31	e 37·1	—
Chicago		65·9	50	10 36	−14	19 41	+ 5	33·8	—
Ann Arbor		67·1	47	11 0	+ 1	19 48	− 3	e 29·5	36·5
Ottawa		67·7	40	11 6	+ 4	19 54	− 4	e 31·1	42·1
Toronto		67·7	44	—	—	21 48	+110	e 33·0	43·9
Edinburgh		67·8	352	—	—	20 0	0	29·1	43·9
Eskdalemuir	N.	68·3	352	e 11 6	0	i 20 7	+ 1	33·1	46·2
Hamburg		68·4	344	i 11 9	+ 2	i 20 11	+ 4	e 34·1	42·1
Lemberg		68·9	333	—	—	e 20 18	+ 5	e 38·9	40·6
Tiflis		69·3	316	e 11 54	+41	e 19 16	−62	e 23·7	30·2
Stonyhurst		69·7	350	e 20 24	?S	(e 20 24)	+ 2	—	45·1
Northfield		69·8	39	—	—	—	—	37·1	—
Ithaca		69·9	41	—	—	e 20 6	−19	e 27·7	—
Bidston		70·2	350	13 16	+118	21 32	+64	—	49·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
De Bilt	E.	70·6	346	—	—	20 39	+ 6	e 33·1	44·2
	N.	70·6	346	—	—	20 37	+ 4	e 34·1	45·0
	Z.	70·6	346	11 20	− 1	20 38	+ 5	—	45·2
Oxford		71·7	350	—	—	i 20 47	+ 1	26·9	46·7
Uccle		71·9	346	e 11 30	+ 1	20 47	− 2	33·9	—
Kew		71·9	350	22 6	?S	(22 6)	+77	—	50·1
Vienna		72·2	338	11 32	+ 1	20 57	+ 5	e 35·6	47·2
Georgetown		72·7	44	11 33	− 1	20 58	0	38·1	49·1
Washington		72·7	44	11 32	− 2	20 56	− 2	38·1	—
Cheltenham	E.	72·9	43	—	—	—	—	38·6	49·3
Strasbourg		73·6	343	11 35	− 5	21 7	− 2	35·1	50·2
Paris		74·1	347	e 11 37	− 6	e 21 16	+ 1	31·1	46·1
Innsbruck		74·2	340	e 11 44	+ 1	e 20 42	−34	e 33·1	44·8
Bombay		74·3	280	20 47	?S	(20 47)	−31	—	41·6
Belgrade		74·5	333	e 11 49	+ 3	e 21 23	+ 3	37·5	42·4
Zurich		74·6	342	11 44	− 2	e 21 21	0	—	—
Le Mans		75·2	348	—	—	—	—	43·1	—
Besançon		75·2	344	—	—	—	—	36·1	—
Batavia		76·9	237	i 12 13	+13	i 21 40	− 8	e 33·0	54·0
Puy de Dôme		77·1	346	e 11 42	−20	—	—	35·1	53·1
Moncalieri		77·1	342	12 22	+20	21 45	− 5	34·7	47·8
Florence		77·6	340	11 51	−14	21 55	− 1	—	47·4
Kodaikanal		78·8	272	32 6	?	—	—	42·4	49·1
Marseilles		79·1	344	e 12 14	0	e 22 24	+11	37·1	48·1
Rocca di Papa		79·2	337	i 12 16	+ 2	i 22 13	− 1	e 38·0	46·5
Athens		80·1	328	e 12 15	− 5	22 16	− 8	e 39·3?	46·1
Colombo		80·2	270	13 24	+64	27 54	?SR_1	45·6	48·6
Pompeii		81·1	336	12 15	−11	—	—	—	—
Barcelona		81·4	345	e 12 25	− 2	e 22 34	− 5	e 32·3	49·2
Tortosa	N.	82·2	347	12 28	− 3	22 50	+ 2	e 37·1	51·8
Toledo		83·7	350	12 27	−13	22 48	−18	e 38·4	54·9
Coimbra	E.	83·7	354	e 12 42	+ 2	22 58	− 8	37·6	41·8
	N.	83·7	354	—	—	—	—	40·4	56·2
Algiers		85·9	344	e 12 45	− 8	23 12	−17	33·1	53·1
Rio Tinto		86·0	352	22 6	?S	(22 6)	−84	—	52·1
San Fernando		87·3	351	—	—	23 18	−26	—	52·9
Riverview		90·1	190	—	—	e 24 36	+21	e 38·0	47·4
Sydney		90·1	190	21 48	?	—	—	42·1	51·7
Adelaide		93·0	199	e 24 6	?S	(e 24 6)	−39	e 53·6	62·1
Melbourne		94·8	194	—	—	e 39 36	?	—	51·6
Wellington		97·6	170	13 50	− 8	25 12	−20	46·8	47·1
La Paz		125·2	65	19 8	[+2]	e 32 44	?	66·1	75·1
La Quiaca	E.	131·2	69	38 0	?SR_1	—	—	78·4	92·4
	N.	131·2	69	39 30	?SR_1	—	—	77·8	92·8
Andalgala	N.	135·4	72	31 42	?	—	—	75·4	80·5
Mendoza		138·4	80	38 54	?SR_1	—	—	74·5	99·0
Pilar		139·9	74	40 36	?SR_1	—	—	76·6	99·8
Cipolletti		142·9	85	—	—	—	—	74·9	90·5
Cape Town		147·1	296	45 43	?SR_1	—	—	—	80·8

Additional readings and notes: Ootomari gives also MN = +8·8m. Mizusawa LN = +11·0m. Osaka MN = +16·1m. Zi-ka-wei MN = +27·2m. Taihoku e = +20m.36s. Honolulu SR_1N = +18m.35s. Ekaterinburg P has been increased by 30m. Berkeley PSE = +16m.43s., SR_2E = +22m.31. Manila MN = +30·0m. Upsala MN = +39·9m. Chicago i = +27m.16s. Ottawa SR_2 = +27m.26s., T_0 = 15h.31m.12s. Toronto i = +28m.42s., eL = +37·2m. Eskdalemuir iSR_1N = +24m.37s. Hamburg iSE = +20m.15s. Tiflis eP = +2m.27s., eN = +5m.51s., e = +11m.25s., MN = +31·4m. Northfield L = +39·1m. Ithaca e = +24m.54s., L = +33·1m. De Bilt iZ = +11m.21s. Vienna iPZ = +11m.34s., eN = +25m.11s., SR_1 = +26m.34s., eLZ = +37·1m., MZ = +42·6m. Georgetown eLE = +29·5m. Cheltenham eE = +29m.37s. Strasbourg MN = +53·2m. Belgrade PR_1 = +12m.29s., PR_2 = +16m.2s. Zurich iPN = +11m.45s. Batavia iE = +21m.53s. Moncalieri MN = +48·1m. Florence P? = +12m.7s. Rocca di Papa eLN = +40·9m., LN = +43·2m., MN = +49·5m. Athens MN = +43·4m. Tortosa iSE = +22m.49s., ME = +55·3m. Toledo SR_1 = +28m.14s., MNW = +50·6m. Algiers MN = +45·6m. San Fernando MN = +52·5m. Riverview MNZ = +48·5m. Adelaide eSR_1 = +40m.36s., eSR_2 = +45m.6s. Wellington +26m.15s. and +31m.33s., T_0 = 15h.31m.2s., also another set of e readings. Pilar MN = +100·8m.

April 13d. Readings also at 1h. (Manila), 7h. (Ekaterinburg, Malabar, and near Batavia), 11h. (Ekaterinburg, Hamburg, and Toledo), 12h. (Moncalieri and Strasbourg), 13h. (Toronto), 17h. (near La Paz), 18h. (Kodaikanal), 20h. (Ekaterinburg), 21h. (Strasbourg, Moncalieri, De Bilt, Victoria, Ottawa, Uccle, Eskdalemuir, Toronto, and Rocca di Papa).

April 14d. Readings at 0h. (Christchurch and Wellington (2)), 1h. (Ekaterinburg), 7h. (Nagasaki), 8h. (near Batavia), 9h. (Ekaterinburg, Ottawa, and Zi-ka-wei), 11h. (near Mizusawa), 14h. (Nagasaki), 15h. (Chicago, Ottawa, Ekaterinburg, Algiers, De Bilt, Moncalieri, and Zi-ka-wei), 16h. (Strasbourg), 17h. (near Barcelona and Tortosa), 20h. (La Paz), 21h. (Ekaterinburg), 22h. (near Mizusawa).

April 15s. Readings at 6h. (near Belgrade), 8h. (Nagasaki and near Malabar and Batavia), 12h. (Florence), 18h. (Ekaterinburg and Zi-ka-wei), 19h. (Ekaterinburg and Zi-ka-wei), 20h. (Algiers and De Bilt), 21h. (near Manila).

April 16d. 15h. 8m. 54s. Epicentre 41°·9N. 142°·1E. (as on 1922 Dec. 8d.).

$A = -\cdot 587$, $B = +\cdot 457$, $C = +\cdot 668$.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Hakodate	1·0	0 30	+15	(0 30)	+ 2	0·7	1·1
Sapporo	1·3	0 22	+ 2	(0 39)	+ 3	0·6	—
Mizusawa N.	2·9	0 44	− 1	1 19	− 1	—	—

Additional readings: Hakodate gives also MN = +1·0m. Mizusawa SE = +1m.25s.

April 16d. Readings also at 3h. (Algiers and Ekaterinburg), 5h. and 8h. (Zi-ka-wei), 9h. (Ekaterinburg), 12h. (Manila), 21h. (Nagasaki).

April 17d. 16h. 55m. 50s. Epicentre 2°·5N. 118°·5E.

$A = -\cdot 477$, $B = +\cdot 878$, $C = +\cdot 044$; $D = +\cdot 879$, $E = +\cdot 477$; $G = -\cdot 026$, $H = +\cdot 038$, $K = -\cdot 999$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	12·3	11	e 2 57	− 6	—	—	—	—
Batavia	14·5	233	i 3 27	− 6	—	—	i 7·8	—
Hong Kong	20·3	348	4 37	− 8	—	—	8·7	8·8
Zi-ka-wei	28·8	5	6 50	+34	—	—	—	15·6
Colombo	38·8	278	14 10	?S	(14 10)	+21	—	27·2
Riverview	47·6	143	—	—	—	—	e 22·3	—
Ekaterinburg	70·9	331	i 11 23	+ 1	i 20 39	+ 2	26·2	—
De Bilt E.	102·0	325	—	—	e 29 10	+175	e 57·2	—

No additional readings.

April 17d. Readings also at 1h. (near Nagasaki (2)), 8h. (Rio Tinto), 11h. (Zi-ka-wei).

April 18d. Readings at 1h. (near Nagasaki), 2h. (Nagoya), 9h. (La Paz), 20h. (near Athens), 22h. (Zante).

1923. April 19d. 3h. 9m. 0s. Epicentre 2°·5N. 118°·5E.

(as on April 17d.).

A = −·477, B = +·878, C = +·044 ; D = +·879, E = +·477 ;
G = −·026, H = +·038, K = −·999.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	12·3	11	i 3 13	+10	—	—	8·8	13·8
Batavia	14·5	233	i 3 19	−14	6 19	− 1	i 7·2	8·0
Malabar	14·6	228	i 3 28	− 6	i 6 31	+ 9	i 7·7	—
Hong Kong	20·3	348	4 42	− 3	(8 28)	− 1	8·5	8·7
Hokoto	21·0	3	4 4	−49	(e 7 53)	−51	e 7·9	—
Taihoku	22·7	7	e 5 10	− 3	(9 22)	+ 3	9·4	—
Zi-ka-wei	28·8	5	6 4	−12	e 10 22	−51	e 11·9	17·3
Calcutta N.	35·5	309	7 4	−14	—	—	—	25·0
Kobe	35·7	25	—	—	—	—	15·4	26·6
Osaka	35·8	25	8 46	+86	12 56	−11	15·5	18·6
Colombo	38·8	278	4 36	−188	12 42	−67	21·0	22·0
Kodaikanal	41·5	282	9 54	+107	—	—	22·3	27·4
Adelaide	42·0	154	e 8 0	−11	(e 14 24)	−11	e 16·3	30·3
Melbourne	47·2	151	9 18	+30	16 36	+52	24·5	31·4
Bombay	47·6	294	e 10 32	+101	15 25	−24	—	—
Riverview	47·6	143	e 8 53	+ 2	e 15 49	0	e 21·4	25·6
Sydney	47·6	143	7 0	−111	15 48	− 1	26·8	28·8
Simla E.	48·3	311	8 48	− 8	15 48	−10	27·6	29·3
N.	48·3	311	8 54	− 2	15 54	− 4	25·2	29·5
Ekaterinburg	70·9	331	i 11 22	0	i 20 33	− 4	35·0	45·6
Tiflis	76·3	314	(e 12 5)	+ 8	e 12 5	?P	e 33·4	39·2
Honolulu E.	83·0	69	—	—	(e 23 51)	+54	—	—
Helwan	86·3	300	i 12 44	−11	23 5	[+ 1]	—	54·5
Athens	92·1	309	e 14 8	+40	23 44	[+ 3]	—	—
Upsala	93·2	330	—	—	e 23 42	[− 5]	e 50·0	62·9
Vienna	96·1	320	e 13 33	−17	24 10	[+ 7]	e 51·4	60·0
Hamburg	98·8	326	e 17 49	?PR_1	e 24 25	[+ 7]	e 49·0	66·0
Bergen	98·9	333	21 0	?PR_1	—	—	—	—
Innsbruck	99·6	320	—	—	—	—	e 46·5	—
Capetown	99·7	235	—	—	—	—	—	51·2
Rocca di Papa	100·0	314	e 16 48	+157	18 6	?PR_1	—	18·5
Florence	100·5	317	14 30	+17	—	—	—	59·5
Strasbourg	101·6	321	e 14 0	−18	i 27 0	+49	51·0	67·3
De Bilt	102·0	325	e 14 1	−19	e 27 11	+56	e 53·0	60·7
Moncalieri	102·7	318	e 14 19	− 5	24 43	[+ 6]	53·3	72·7
Uccle	102·9	324	e 18 21	?PR_1	e 24 43	[+ 5]	e 51·0	61·0
Besançon	103·1	320	—	—	—	—	59·0	—
Paris	104·7	322	—	—	—	—	e 54·0	61·0
Edinburgh	104·9	330	i 18 36	?PR_1	—	—	52·0	64·7
Eskdalemuir z.	105·2	330	i 18 39	?PR_1	—	—	—	—
Kew	105·4	326	—	—	—	—	—	64·0
Puy de Dôme	105·5	320	—	—	—	—	—	61·0
Stonyhurst	105·5	327	e 20 54	?PR_1	29 48	+181	—	67·0
Oxford	105·8	326	18 43	?PR_1	24 53	[+ 2]	55·0	63·8
Victoria E.	106·2	38	26 37	?S	(26 37)	−17	38·7	52·3
N.	106·2	38	26 30	?S	(26 30)	−24	38·6	—
Algiers	108·5	311	e 18 54	?PR_1	25 54	[− 9]	e 45·0	70·5
Tortosa N.	109·0	316	—	—	—	—	55·3	65·4
Toledo	112·6	315	e 19 8	?PR_1	e 29 11	+80	e 45·0	69·8
Rio Tinto	115·3	314	22 0	?	—	—	—	75·0
Coimbra E.	115·4	317	15 43	+21	e 28 43	+30	56·0	67·6
N.	115·4	317	e 15 35	+13	e 29 13	+60	—	70·7
San Fernando	115·6	312	—	—	—	—	—	75·0
Lisbon	116·7	316	—	—	—	—	e 60·8	—
Chicago	129·8	24	i 22 44	?PR_1	—	—	58·0	—
Ottawa	130·4	12	e 22 41	?PR_1	—	—	56·0	—
Ann Arbor	130·9	20	e 23 0	?PR_1	—	—	57·0	—
Toronto	131·1	16	—	—	—	—	51·0	90·1
Ithaca	133·0	13	e 23 0	?PR_1	e 26 0	?	69·0	—
Washington	136·1	16	—	—	—	—	e 70·0	—
La Paz	164·6	155	i 20 16	[+ 4]	e 34 34	?	73·0	82·7

Additional readings: Manila gives also MN = +12·1m. Batavia L = +26·0m. Zi-ka-wei MN = +14·7m., MZ = +18·7m., readings given as for 13h. Calcutta PN = +7m.6s. Kobe MN = +15·6m. Osaka MN = +13·1m. Adelaide ePR_2? = +9m.48s., eSR_1 = +13m.0s., true S is given as SR_2. Melbourne PR_1 = +11m.18s., SR_1 = +20m.12s. Riverview MZ = +32·0m., MN = +32·3m. Ekaterinburg PR_1 = +14m.16s., PR_2 = +15m.46s., iPS = +21m.25s. Tiflis eE = +2m.34s. and +2m.43s., eN = +4m.54s. and +5m.12s., MN = +48·3m. Honolulu eN = +23m.10s.

Continued on next page.

Upsala MN = +56·5m. Vienna eNE = +16m.33s., PR_1Z = +17m.25s., PR_2? = +19m.0s., e = +21m.21s., PS = +25m.30s., eLZ = +53·0m. Hamburg MN = +59·0m. Rocca di Papa ePE = +17m.18s. Strasbourg i = +18m.9s. De Bilt ePR_1 = +18m.11s., e = +24m.40s., MN = +60·9m., MZ = +65·4m. Moncalieri MN = +66·2m. Uccle e = +33m.18s. Paris MN = +57·0m. Victoria SN = +29m.13s., SE = +29m.15s. Algiers MN = +59·0m. Tortosa ME = +68·6m. Toledo MNW = +68·2m. San Fernando MN = +79·0m. Ottawa eL? = +42·0m. Toronto L = +73·5m., eL = +84·1m. Ithaca e = +45m.0s., L = +82·0m. La Paz PR_1 = +26m.43s., SR_1 = +42m.19s.

April 19d. Readings also at 4h. (Malabar and Batavia), 5h. (Batavia), 6h. (Zi-ka-wei), 8h. (Colombo), 9h. (Nagasaki), 13h. (Azores), 15h. (Strasbourg), 16h. (Batavia), 20h. (near Nagasaki and near Osaka and Kobe).

April 20d. Readings at 3h. (Bidston), 10h. (Colombo and Ekaterinburg), 12h. (Algiers), 13h. and 14h. (La Paz), 15h. (Batavia and Malabar), 18h. (near Mostar), 22h. (Nagasaki), 23h. (Ekaterinburg and near Algiers).

April 21d. 17h. 12m. 40s. Epicentre 30°·5S. 70°·0W.

A = +·295, B = −·810, C = −·508 ; D = −·940, E = −·342 ;
G = −·174, H = +·477, K = −·862.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mendoza		2·8	149	−0 10	−54	—	—	0·5	1·1
Andalgala	N.	4·4	48	1 14	+ 6	—	—	2·1	2·6
Pilar		5·4	104	2 50	?L	—	—	3·7	4·1
Cipolletti		8·6	170	3 50	?S	(3 50)	− 3	4·3	4·4
La Plata	E.	11·1	117	2 48	+ 2	4 56	0	5·4	6·6
	N.	11·1	117	2 58	+12	4 57	0	5·7	6·4
La Paz		14·1	7	3 28	+ 1	6 12	+ 2	7·6	8·8

Additional readings and notes : Andalgala readings all increased by 4m. Pilar gives also PN = +3m.20s. La Plata N = +5m.12s., T_0 = 17h.13m.4s.

April 21d. Readings at 2h. and 7h. (2) (La Paz), 9h. (Batavia), 11h. (Zante and La Paz), 15h. (Rio Tinto), 23h. (Batavia).

April 22d. Readings at 5h. and 7h. (Nagasaki), 10h. (Manila), 14h. and 15h. (Zi-ka-wei), 21h. (Malaga), 23h. (near La Paz).

1923. April 23d. 3h. 17m. 0s. Epicentre 29°·0N. 124°·5E.

A = −·495, B = +·721, C = +·485 ; D = +·824, E = +·566 ;
G = −·275, H = +·400, K = −·875.

[But see also Note at end].

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Zi-ka-wei		3·4	310	0 46	− 7	e 1 22	−12	—	—
Taihoku		4·8	214	0 38	−36	—	—	e 2·3	—
Nagasaki		5·9	49	1 11	−20	e 2 36	− 5	3·2	4·0
Hokoto		7·0	219	0 13	−93	2 23	−47	4·7	—
Kobe		10·7	55	2 33	− 7	5 4	+16	7·0	7·3
Osaka		10·9	56	2 37	− 6	—	—	6·2	8·2
Hong Kong		11·4	237	2 45	− 5	5 38	+34	6·5	9·5
Nagoya		12·2	56	2 51	−11	—	—	8·9	9·4
Manila		14·9	194	e 3 15	−23	—	—	—	—
Mizusawa	E.	17·1	49	3 57	− 9	7 43	+23	11·4	—
	N.	17·1	49	3 57	− 9	7 22	+ 2	10·7	—
Hakodate		18·3	41	4 52	+32	—	—	—	—
Sapporo		19·6	39	4 45	+ 9	7 0	−75	10·8	—
Ootomari		22·7	34	5 5	− 8	(9 30)	+11	9·5	15·9
Calcutta	E.	33·1	269	15 12	?L	—	—	(15·2)	—
Batavia		39·1	210	7 17	−30	—	—	e 29·4	—
Simla	E.	40·7	286	e 14 36	?S	(e 14 36)	+19	e 24·3	—
Colombo		47·5	251	15 30	?S	(15 30)	−18	32·5	37·5
Kodaikanal		47·7	259	17 6	?S	(17 6)	+76	30·0	33·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Bombay		47·9	271	e 14 6	?S	(e 14 6)	−107	—	—
Ekaterinburg		51·9	321	i 9 19	0	i 16 54	+11	28·0	34·8
Tiflis		63·9	307	e 12 36	+119	—	—	e 38·5	42·0
Riverview		67·7	157	—	—	e 19 54	− 4	—	35·6
Upsala		73·0	330	—	—	e 21 10	+ 8	e 39·0	50·3
Lemberg		74·4	319	—	—	—	—	e 40·7	45·0
Bergen		78·0	335	—	—	22 0	0	43·8	51·6
Budapest		78·5	320	e 11 58	−12	e 22 31	+25	e 26·7	—
Vienna		79·6	321	e 12 12	− 5	22 43	+24	e 42·0	52·0
Hamburg		79·9	328	e 12 23	+ 5	e 23 12	+50	e 42·0	51·0
Athens		80·3	308	—	—	—	—	—	53·4
Victoria	E.	81·8	39	12 31	+ 2	22 38	− 6	43·9	50·1
	N.	81·8	39	12 24	− 5	22 37	− 7	—	55·5
Innsbruck		82·9	321	—	—	—	—	e 42·5	51·5
De Bilt		83·1	328	e 12 40	+ 3	e 23 3	+ 5	e 42·0	52·4
Strasbourg		84·1	324	e 12 40	− 3	e 24 12	+63	43·0	54·4
Edinburgh		84·2	333	—	—	e 23 12	+ 2	46·0	49·2
Uccle		84·4	327	e 12 38	− 6	e 23 0	−12	42·0	53·0
Zurich		84·4	322	e 13 10	+26	23 0	−12	e 45·0	—
Eskdalemuir	E.	84·6	333	12 40	− 6	e 23 7	− 8	42·0	49·3
Florence		85·0	319	12 30	−18	—	—	—	57·5
Stonyhurst		85·2	331	e 23 18	?S	(23 18)	− 3	—	54·5
Rocca di Papa		85·4	316	—	—	—	—	48·4	61·9
Besançon		85·8	324	12 54	+ 2	24 37	+69	—	47·0
Bidston		85·9	331	14 6	+73	23 18	− 11	—	60·0
Kew		86·0	330	—	—	—	—	—	53·0
Moncalieri		86·3	321	e 13 6	+11	23 38	+ 5	46·7	55·2
Paris		86·6	327	e 12 51	− 6	e 24 47	+70	46·0	55·0
Barcelona		91·7	321	—	—	—	—	e 49·0	56·2
Tortosa	N.	93·1	322	—	—	27 13	?	49·1	55·8
Algiers		94·3	317	—	—	—	—	53·0	59·5
Toledo		96·1	324	—	—	—	—	e 52·5	62·6
Coimbra	E.	98·1	327	e 15 0	+59	—	—	52·5	65·6
	N.	98·1	327	e 15 30	+89	e 27 30	+113	51·5	65·5
Rio Tinto		99·1	324	26 0	?S	(26 0)	+13	—	59·0
Lisbon		99·7	326	—	—	—	—	e 52·7	—
San Fernando		99·8	323	24 0	?S	(24 0)	[−23]	—	97·5
Chicago		103·3	25	24 28	?	34 43	?	e 50·2	—
Ottawa		103·3	15	25 53	?S	(25 53)	−34	47·0	59·0
Toronto		104·1	18	—	—	—	—	58·5	62·7
Ann Arbor		104·1	21	—	—	—	—	54·0	—
Ithaca		106·0	16	—	—	—	—	44·0	—
Georgetown	E.	109·2	17	—	—	—	—	e 61·7	—
La Paz		162·9	46	20 25	[+15]	e 34 55	?	82·2	88·2

Additional readings and notes: Zi-ka-wei, P has been increased by 2min. Taihoku, P has been increased by 2 min. Nagasaki, P and S have been increased by 2min. Kobe gives also MN = +7·2m. Ootomari MN = +14·3m. Ekaterinburg SR_1 = +20m.43s., i = +21m.25s. Simla eLN = +22·8m. Tiflis eLN = +37·6m., MN = +45·1m. Riverview MN = +35·2m. Upsala MN = +43·4m. Budapest readings have been diminished by 20m. Vienna e = +13m.13s. and +14m.22s., PR_1 = +15m.36s., SN = +22m.41s., eE = +23m.21s. Hamburg MZ = +52·6m., MN = +53·0m. De Bilt eSR_1 = +28m.48s., eSR_2 = +33m.12s., MN = +51·6m., MZ = +55·3m. Strasbourg MN = +50·8m. Uccle SR_1 = +29m.6s., SR_2 = +33m.0s., MN = +50·0m. Eskdalemuir eE = +16m.11s., eZ = +24m.17s., SR_1 = +29m.5s. Moncalieri MN = +57·4m. Paris MN = +58·0m. Barcelona MN = +58·6m. Tortosa ME = +63·9m. Toledo MNW = +61·4m. San Fernando MN = +67·5m. Ottawa S = +33m.7s., eL = +41·5m. Toronto eL = +64·5m. Ithaca L = +71·0m. Georgetown L = +66·4m.

NOTE.—The above solution is not quite satisfactory because the adopted value of T_0 does not suit many of the observations. Those made at Zi-ka-wei, De Bilt, Uccle, and Eskdalemuir are suited well: corrections to T_0 calculated in the usual way are only −1s., +2s., 0s., and −1s., which seems almost conclusive. But then we find for

	s.		s.		s.
Nagasaki	−39	Ekaterinburg	−14	Besançon	− 82
Kobe	−36	Vienna	−41	Paris	−101
Hong Kong	−54	Hamburg	−51		
Mizusawa	−25	Strasbourg	−75		

which suggest a $\delta T_0 = -40$sec. about. Moreover, as regards the four discordant observatories above-mentioned, Zi-ka-wei is so close to the epicentre that there may be some ambiguity about the readings: while the other three have $\Delta > 80°$,

where [S] may be mistaken for S. Taking the observations as they stand, if they refer to [S] we should get $\delta T_0 = -17$s., -24s., and -30s. respectively. But the change may be even greater than this, for if we suppose T_0 diminished by 40s., the La Paz residual for [P] becomes [+55s.], suggesting a very high focus: a suggestion supported by the other observations if this change in T_0 is made. A trial solution, with focus at a *height* ·060 above normal was therefore made. It seems highly improbable that such a height above the normal is possible, for other evidence points to a depth of the normal focus below the surface not greater than ·040, so that a height ·060 above this would be outside the surface. But there is something to be said for following out any suggestion to see where it may lead. It will suffice to give the residuals in P and S.

Trial Solution with *height* of Focus 0·060.

April 23d. 3h. 16m. 20s. Epicentre 29°·0N. 122°·5E.

$A = -\cdot 470$, $B = +\cdot 738$, $C = +\cdot 485$.

	Focus	Δ	O−C. P.	O−C. S.		Focus	Δ	O−C. P.	O−C. S.
	°	°	s.	s.		°	°	s.	s.
Zi-ka-wei	−1·5	2·4	+72	+97	Batavia	+4·5	38·3	−20	—
Taihoku	−0·6	4·1	+23	—	Colombo	+5·2	45·8	—	−21
Hokoto	−0·3	6·1	−37	−24	Kodaikanal	+5·2	46·1	—	+71
Nagasaki	0·0	7·3	0	− 2	Bombay	−5·2	46·2	—	−110
Hong Kong	+0·7	10·0	+45	+90	Ekaterinburg	+5·6	50·8	+11	− 5
Kobe	+1·1	12·2	− 4	− 7	Tiflis	+6·3	62·5	+126	—
Osaka	+1·1	12·4	− 3	—	Riverview	+6·7	68·4	—	−47
Nagoya	+1·4	13·7	− 9	—	Budapest	+7·1	77·4	(− 7)	(− 3)
Manila	+1·5	14·4	+ 4	—	Vienna	+7·1	78·5	+ 1	− 3
Mizusawa E.	+2·1	18·4	−10	−11	Hamburg	+7·2	79·0	+ 9	+20
N.	+2·1	18·4	−10	−32	Strasbourg	+7·3	83·1	+ 2	+34
Hakodate	+2·2	19·0	+38	—	Besançon	+7·4	84·8	+ 6	−41
Sapporo	+2·4	20·6	+13	−97	Paris	+7·4	85·7	− 2	+41

From this list observations have been omitted when it seemed doubtful whether S or [S] had been observed. These are given separately below. It is presumed that the correction to Δ for the height of focus, which is applicable both for P and S, is also applicable for [S], and since it is nearly constant at about 7°·2 it has been added straight away to Δ for simplicity. The last two columns, headed "With ·040," will be explained presently.

	Corr. Δ	P.	O−C.	S.	O−C.	[S.]	With ·040 Δ	With ·040 [S.]
	°	m. s.	s.	m. s.	s.	s.	°	s.
Bergen	84·4	—	—	22 40	−32	−12	82·4	−14
De Bilt	89·6	e 13 20	+ 6	e 23 43	−27	+17	87·6	+15
Edinburgh	90·8	—	—	e 23 52	−30	+19	88·7	+17
Uccle	90·8	e 13 18	− 2	e 23 40	−42	+ 7	88·7	+ 5
Zurich	90·8	e 13 50	+30	23 40	−42	+ 7	88·7	+ 5
Eskdalemuir	91·2	13 20	− 2	e 23 47	−39	+12	89·1	+ 9
Florence	91·2	23 10	?S	23 10	−76	−25	89·1	−28
Stonyhurst	91·8	e 23 58	?S	(e 23 58)	−35	+19	89·7	+17
Bidston	92·5	14 46	+76	23 58	−42	+15	90·4	+13
Moncalieri	92·6	e 13 46	+16	24 18	−23	+35	90·5	+32
Rio Tinto	105·7	26 40	?S	(26 40)	− 9	+110	103·6	+103
Ottawa	111·4	26 33	?S	(26 33)	−68	+77	109·4	+76
Chicago	111·7	25 8	?S	(25 8)	−155	− 9	109·6	−15

Now inspection suggests that on the whole [S] is the more likely. But the residuals are chiefly positive, only 3 being negative out of 13. Arranged in order they are +110, +77, +35, +19, +19, +17, +15, +12, +7, +7, −9, −12, −25. The implication is that the correction to T_0 is too large by some 15 seconds (the median), and we may accept this at its full value since it carries with it a consequent diminution of the height of focus, which would restore further positive residuals. In fact, the assumed height ·060 is shown to be definitely excessive, along with the correction to T_0, and we may in future look to the values of [S] as well as those of [P] to help us in assigning these quantities. Let us therefore try a height ·040 for the focus (the highest yet observed) and T_0 = April 23d. 3h. 16m. 35s. On making a new computation of the epicentre, corrections to that originally adopted were found to be practically the same as with height ·060 and T_0 15sec. greater.

We may first consider what happens to the stations which record [S]. The consequences of this new supposition are shown in the last two columns above, headed "With ·040," and it will be seen that the residuals are only very slightly reduced because the reduction of the focus correction by about 2° nearly compensates the increase of T_0 by 15sec. As above remarked, we may increase T_0 still further without introducing anomalies into *these* observations. Let us therefore make the height now 0·030, which is in better accord with previous experience, and the correction to the original T_0 only 20sec. instead of 40sec.

Solution with Height of Focus 0·030.

April 23d. 3h. 16m. 40s. Epicentre 29°0N. 122°5E.

	Focus	Δ	O−C. P.	O−C. S.		Focus	Δ	O−C. P.	O−C. S.
	°	°	s.	s.		°	°	s.	s.
Zi-ka-wei	−0·5	2·4	+37	+49	Batavia	+2·4	38·3	−24	—
Taihoku	−0·1	4·1	− 4	—	Colombo	+2·9	45·8	—	−12
Hokoto	+0·1	6·1	−62	− 6	Kodaikanal	+2·9	46·1	—	+80
Nagasaki	+0·2	7·3	−21	−28	Bombay	+2·9	46·2	—	−101
Hong Kong	+0·4	10·0	+29	+78	Ekaterinburg	+3·1	50·8	+ 7	+ 6
Kobe	+0·6	12·2	−17	−15	Tiflis	+3·6	62·5	+124	—
Osaka	+0·6	12·4	−16	—	Riverview	+3·7	68·4	—	−37
Nagoya	+0·7	13·7	−21	—	Budapest	+3·9	77·4	(− 9)	(+13)
Manila	+0·7	14·4	− 5	—	Vienna	+4·0	78·5	− 1	+11
Mizusawa E.	+1·1	18·4	−18	−10	Hamburg	+4·0	79·0	+ 7	+35
N.	+1·1	18·4	−18	−31	Strasbourg	+4·1	83·1	0	+49
Hakodate	+1·1	19·0	+31	—	Besançon	+4·1	84·8	+ 4	+55
Sapporo	+1·2	20·6	+ 2	−101	Paris	+4·1	85·7	− 4	+54

It is, after all, very difficult to claim decisive superiority for any one of these three solutions (say A, B, C: focal heights ·000, ·060, ·030) over the others. We may put their claims in order of merit, thus (for the stations recording P and S):

Zi-ka-wei	A, C, B	Manila	B, C, A	Tiflis	equal
Taihoku	C, B, A	Mizusawa	A, B, C	Riverview	A, C, B
Nagasaki	B, A, C	Hakodate	equal	Budapest	B, C, A
Hokoto	C, B, A	Sapporo	C, A, B	Vienna	B, C, A
Kobe	equal	Batavia	B, C, A	Hamburg	equal
Osaka	B, A, C	Colombo	C, A, B	Strasbourg	equal
Hong Kong	A, C, B	Kodaikanal	equal	Besançon	equal
Nagoya	B, A, C	Ekaterinburg	equal	Paris	equal

Slight differences of merit have been neglected, under the term "equal." A thus appears first in 4 cases, second in 5, and third in 6; B has 7, 3, 5; C has 4, 7, 4. Both B and C thus appear slightly superior to A, according to these figures. But the real objection to A is that stated at the outset of the note, viz., that the T_0 adopted is conspicuously not supported by the majority of observatories. The objection to B is the very improbable focal height. These objections both apply in lesser degree to the compromise solution C, which may be regarded as minimising objections rather than as commending itself directly.

April 23d. Readings also at 1h. (near La Paz), 2h. (near Mizusawa (2)), 4h. (2) and 5h. (Zi-ka-wei), 6h. (Ekaterinburg), 7h. (Zi-ka-wei, Strasbourg, De Bilt, Hamburg, Upsala, Edinburgh, and Eskdalemuir), 11h. (La Paz and Zi-ka-wei), 12h. (Manila), 14h. (Ekaterinburg, Upsala, and Tiflis), 15h. (Zi-ka-wei, De Bilt, Strasbourg, and Hamburg), 16h. (Besançon), 18h. and 21h. (La Paz), 23h. (Zi-ka-wei).

April 24d. 5h. 31m. 30s. Epicentre 0°·0 122°·4E. (as on 1923 Feb. 23d.).

A = −·536, B = +·844, C = ·000; D = +·844, E = +·536;
G = ·000, H = ·000, K = −1·000.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	14·7	354	e 3 53	+18	—	—	9·4	—
Malabar	16·5	244	3 56	− 3	—	—	i 8·2	—
Batavia	16·7	248	3 57	− 4	7 4	− 7	i 8·3	—
Hong Kong	23·7	341	5 23	− 2	—	—	—	—
Zi-ka-wei	31·2	358	e 6 42	+ 2	—	—	—	—
Ekaterinburg	75·0	331	—	—	—	—	43·5	—
De Bilt	106·6	326	—	—	e 25 30	−87	e 60·5	—
Ucele	107·5	325	—	—	—	—	—	58·5

Malabar gives also i = +7m.49s.

April 24d. 14h. 3m. 12s. Epicentre 31°·2S. 69°·6W.

A = +·298, B = −·802, C = −·518; D = −·937, E = −·349; G = −·181, H = +·486, K = −·855.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mendoza		2·0	148	0 48	+17	—	—	1·3	1·9
Andalgala	N.	4·6	38	1 24	+13	(1 54)	−12	1·9	2·2
Cipolletti		7·9	171	3 18	?S	(3 18)	−16	—	5·5
La Quiaca	E.	9·7	21	4 42	?S	(4 42)	+21	5·6	5·9
	N.	9·7	21	5 12	?S	(5 12)	+51	6·8	7·1
La Paz		14·8	5	i 3 36	0	i 6 24	− 3	6·9	10·6
Rio de Janeiro	E.	24·9	77	—	—	10 13	+12	12·9	14·3
	N.	24·9	77	i 5 37	0	10 3	+ 2	12·6	14·2
De Bilt		105·7	38	—	—	—	—	e 58·8	—
Ekaterinburg		137·4	38	—	—	—	—	78·8	—

Mendoza and Andalgala readings have been increased by 5m. and 4m. respectively.

April 24d. 22h. 3m. 6s. Epicentre 29°·6N. 87°·8E. (as on 1918 Feb. 4d.).

A = +·033, B = +·869, C = +·494; D = +·999, E = −·038; G = +·019, H = +·494, K = −·870.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	E.	7·1	176	1 51	+ 3	—	—	3·5	3·9
Simla	E.	9·3	282	2 0	−20	(e 3 18)	−52	e 3·3	—
	N.	9·3	282	2 12	− 8	(e 4 24)	+14	e 4·4	—
Bombay		17·3	235	3 15	−54	—	—	—	—
Kodaikanal		21·7	209	10 0	?L	—	—	(10·0)	—
Colombo		23·9	200	11 54	?L	—	—	(11·9)	14·9
Zi-ka-wei		28·9	78	e 6 29	+12	e 11 35	+20	—	—
Ekaterinburg		33·2	333	—	—	12 50	+23	15·9	22·3
Manila		34·0	109	—	—	e 12 37	− 3	—	—
Rocca di Papa		60·5	304	—	—	—	—	—	27·0
Strasbourg		62·0	312	—	—	—	—	e 38·9	—
De Bilt	E.	62·8	317	—	—	—	—	e 34·9	40·5
	N.	62·8	317	—	—	—	—	e 33·9	35·4
Paris		65·3	314	—	—	—	—	e 40·9	—
Kew		66·1	318	—	—	—	—	—	43·9
Eskdalemuir		66·6	322	—	—	—	—	e 34·9	—

No additional readings.

April 24d. 22h. 44m. 42s. Epicentre 59°·0N. 135°·5W.

A = −·367, B = −·361, C = +·857; D = −·701, E = +·713; G = −·611, H = −·601, K = −·515.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		2·0	177	0 24	− 7	—	—	1·1	1·2
Victoria	E.	12·8	141	3 8	− 2	—	—	6·1	8·8
	N.	12·8	141	3 3	− 7	—	—	6·1	8·6
Chicago		34·0	100	7 8	+ 3	12 46	+ 6	17·2	—
Ann Arbor		35·6	95	—	—	—	—	e 18·3	—
Toronto		36·9	90	—	—	—	—	i 20·1	—
Ottawa		37·6	85	—	—	e 13 33	+ 1	e 19·3	20·8
Ithaca		39·2	89	—	—	—	—	e 20·8	—
Northfield		40·0	84	—	—	e 12 18	−109	21·8	—
Georgetown		41·5	93	15 56	?S	(15 56)	+88	(22·4)	—
Washington		41·5	93	—	—	—	—	e 17·3	—
Cheltenham		41·8	93	—	—	—	—	e 22·4	22·7
Eskdalemuir		59·5	30	—	—	—	—	e 31·3	—
De Bilt		64·4	27	—	—	—	—	e 40·3	—
Uccle		65·4	29	—	—	—	—	—	63·3
Paris		66·9	30	—	—	—	—	e 39·3	—
Strasbourg		68·3	27	—	—	—	—	e 41·3	—
La Paz		93·1	118	i 38 37	?L	—	—	(i 38·6)	—

No additional readings.

April 24d. Readings also at 0h. (Ekaterinburg), 2h. (Nagasaki), 4h. (Zi-ka-wei), 9h. (Manila and Zi-ka-wei), 10h. (Sydney and Zi-ka-wei), 13h. (Zi-ka-wei and near Athens), 18h. (Batavia), 20h. (Nagasaki).

April 25d. 19h. 31m. 56s. Epicentre 59°·0N. 135°·5W. (as on April 24d.).

A = −·367, B = −·361, C = +·857 ; D = −·701, E = +·713 ;
G = −·611, H = −·601, K = −·515.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	2·0	177	0 32	+ 1	—	—	1·0	1·3
Victoria	12·8	141	3 8	− 2	—	—	5·8	8·8
Chicago	34·0	100	7 1	− 4	12 44	+ 4	17·4	—
Ann Arbor	35·6	95	e 7 4	−14	—	—	i 19·7	20·2
Toronto	36·9	90	—	—	—	—	e 18·9	20·9
Ottawa	37·6	85	7 30	− 5	13 34	+ 2	18·6	20·6
Ithaca	39·2	89	—	—	—	—	21·5	—
Northfield	40·0	84	—	—	—	—	e 18·1	—
Georgetown	41·5	93	—	—	22 33	?L	(22·6)	—
Washington	41·5	93	e 7 4	−63	—	—	—	—
Cheltenham	41·8	93	—	—	—	—	e 22·4	23·1
Edinburgh	59·0	30	—	—	—	—	e 31·1	—
Eskdalemuir	59·5	30	—	—	—	—	28·1	—
Oxford	63·2	31	—	—	—	—	—	39·1
Ekaterinburg	63·4	352	—	—	e 19 16	+10	29·1	—
Kew	63·7	30	—	—	—	—	—	41·1
De Bilt	64·4	27	—	—	—	—	e 35·1,	—
Paris	66·9	30	—	—	e 28 4	?L	37·1	—
Strasbourg	68·3	27	—	—	—	—	e 36·1	—
Moncalieri	71·7	28	—	—	—	—	39·0	—
Tortosa N.	73·7	35	—	—	—	—	39·7	45·8
Rio Tinto	74·4	40	35 34	?L	—	—	(35·6)	42·1
La Paz	93·1	118	e 18 6	?PR_1	—	—	58·6	61·9

Additional readings: Sitka gives also MN = +1·2m. Victoria LN = +5·9m. Toronto eL = +20·6m. Ithaca e = +18m.28s. Georgetown eEN = +18m.4s. Cheltenham eN = +22m.5s. and +22m.51s., MN = +23·2m. Moncalieri e = +29m.11s.

April 25d. Readings also at 5h. (Zi-ka-wei), 8h. (La Paz), 11h. (Manila and Algiers), 19h. (near Sitka), 20h. (Georgetown), 22h. (Apia and near La Paz).

April 26d. Readings at 2h. and 7h. (near La Paz), 20h. (Zi-ka-wei), 22h. (near Nagasaki).

April 27d. 7h. 15m. 56s. Epicentre 41°·0N. 140°·0E.

A = −·578, B = +·485, C = +·656 ; D = +·643, E = +·766 ;
G = −·503, H = +·422, K = −·755.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hakodate	0·9	36	0 20	+ 6	—	—	0·6	1·2
Mizusawa E.	2·1	155	0 29	− 4	0 53	− 5	—	—
N.	2·1	155	0 30	− 3	0 52	− 6	—	—
Sapporo	2·3	26	3 41	?	—	—	4·1	—
Nagoya	6·3	203	2 1	+25	—	—	—	—
Osaka	7·3	211	1 30	−21	—	—	3·6	3·8
Zi-ka-wei	17·9	243	4 12	− 4	e 7 34	− 4	—	—
Ekaterinburg	51·3	316	e 9 26	+11	i 16 17	−18	27·1	—
La Paz	145·5	53	19 29	[−20]	—	—	—	—

Additional readings: Hakodate gives also MN = +0·9m. Osaka MN = +4·1m. Ekaterinburg e = +11m.1s.

April 27d. 10h. 26m. 4s. Epicentre 1°·0S. 127°·0E.

A = −·602, B = +·798, C = −·017 ; D = +·799, E = +·602 ;
G = +·011, H = −·014, K = −1·000.

Very rough.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		16·7	340	e 4 10	+ 9	—	—	—	—
Batavia		20·8	255	i 4 53	+ 2	i 8 44	+ 4	—	—
Hong Kong		26·5	333	5 46	− 7	10 1	−31	11·6	11·8
Zi-ka-wei		32·6	353	4 48	−125	—	—	—	20·1
Osaka		36·5	12	6 59	−27	(11 36)	−101	11·6	13·6
Riverview		39·9	147	—	—	e 14 26	+21	e 22·6	25·5
Colombo		47·7	280	12 8	?PR_1	—	—	—	33·9
Kodaikanal		50·6	283	29 14	?L	—	—	(29·2)	—
Ekaterinburg		77·9	329	12 14	+ 8	21 50	− 9	30·9	—
Strasbourg		109·7	321	—	—	e 28 56	+91	e 59·9	—
De Bilt	E.	109·8	326	—	—	—	—	e 55·9	70·0
	N.	109·8	326	—	—	—	—	e 56·9	69·8
Uccle		110·8	324	—	—	e 28 50	+75	e 57·9	—
Edinburgh		112·1	331	—	—	—	—	59·9	—
Eskdalemuir		112·5	331	—	—	—	—	56·9	—
Paris		112·7	323	—	—	e 29 56	+124	63·9	—
Ottawa		131·3	20	22 56	?PR_1	—	—	66·9	—

Additional readings: Zi-ka-wei gives also MN = +18·1m., MZ = +18·8m.
Riverview e = +17m.32s. Uccle readings have been diminished by 1h.
Ottawa eL = +39·4m.

April 27d. Readings also at 3h. (near Nagasaki), 6h. (La Paz and near Nagasaki), 8h. (Zi-ka-wei), 14h. (Coimbra), 17h. (Rio Tinto), 21h. (Ekaterinburg and near Tortosa), 23h. (near Manila).

April 28d. Readings at 0h. (Marseilles), 2h. (Ann Arbor), 3h. (Florence), 12h. and 21h. (Athens), 22h. (Zi-ka-wei), 23h. (near Belgrade).

April 29d. 2h. 31m. 24s. Epicentre 40°·5N. 122°·0W. (as on 1922 Nov. 4d.).

A = −·403, B = −·645, C = +·649 ; D = −·848, E = +·530 ;
G = −·344, H = −·551, K = −·760.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Berkeley		2·6	186	0 48	+ 7	1 13	+ 1	1·8	—
		2·6	186	0 49	+ 8	1 15	+ 3	1·8	—
Victoria	E.	8·0	354	2 3	+ 2	—	—	3·4	5·6
	N.	8·0	354	1 51	−10	—	—	3·7	6·2
Chicago		25·8	76	5 51	+ 5	10 30	+12	13·6	—
Toronto		31·4	70	—	—	—	—	42·7	—
Ottawa		33·5	65	6 55	− 6	12 36	+ 4	e 18·1	23·0
Ithaca		33·7	71	—	—	—	—	e 17·6	—
Washington		34·2	79	—	—	e 13 26	+53	e 20·6	—
Honolulu	E.	36·0	250	—	—	—	—	e 14·9	16·9
	N.	36·0	250	—	—	—	—	e 14·3	16·0
Eskdalemuir		71·0	31	—	—	—	—	28·6	—
De Bilt	E.	76·7	30	—	—	—	—	e 35·6	42·6
Uccle		77·4	30	—	—	—	—	—	43·6
Paris		78·2	35	—	—	—	—	e 42·6	—
Strasbourg		80·5	32	—	—	—	—	e 42·6	—

Additional readings and notes: Berkeley readings have been diminished by 2m.
Ottawa gives also L = +20·3m., T_o = 2h.31m.8s. Ithaca L = +20·6m.
De Bilt eLN = +37·6m., MZ = +47·6m.

April 29d. 9h. 33m. 50s. Epicentre 43°·5N. 16°·5E. (as given by De Bilt for 30d.).

A = +·696, B = +·206, C = +·688.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sinj	0·3	7	i 0 32	+27	i 0 40	+32	—	0·8
Mostar	1·0	99	i 0 9	− 6	i 0 24	− 4	—	0·4
Sarajevo	1·5	75	i 0 33	+10	i 1 1	+20	—	1·2
Belgrade	3·1	65	0 58	+ 9	e 1 55	+29	—	2·4
Pompeii	3·1	208	1 10	?S	(1 10)	−16	—	—

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.	3·3	238	i 0 55	+ 3	5 10	?	—	—
	N.	3·3	238	i 0 49	− 3	5 22	?	—	—
Venice		3·5	304	i 0 38	−17	—	—	—	3·2
Florence		3·8	277	0 57	− 2	—	—	—	—
Vienna		4·8	359	1 10	− 4	i 2 9	− 2	i 2·6	—
Innsbruck		5·1	318	e 1 2	−17	e 2 28	+ 8	—	—
Moncalieri		6·4	286	e 2 30	?S	(e 2 30)	−25	—	—
Zurich		6·8	307	e 1 32	−12	—	—	—	—
Strasbourg		7·9	313	e 2 22	+22	e 3 28	− 6	(e 4·3)	—
Uccle		11·0	316	e 5 37	?L	—	—	(e 5·6)	—

Additional readings: Mostar gives also eP = 9h.33m.44s. Belgrade eP = +1m.12s., i = +1m.45s., MN = +2·2m. Rocca di Papa ePE = +32s. Vienna i = +1m.24s., iPR,Z = +1m.29s.

April 29d. 9h. 34m. 20s. Epicentre 40°·0N. 37°·0E.

A = +·612, B = +·461, C = +·643; D = +·602, E = −·799; G = +·513, H = +·387, K = −·766.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		10·5	263	e 2 44	+ 7	5 22	+39	5·8	6·7
Helwan		11·1	206	2 57	+11	5 0	+ 3	—	9·2
Lemberg		13·4	321	e 2 52	−26	—	—	—	13·3
Vienna		16·8	306	(4 11)	+ 9	i 7 34	+21	i 10·8	12·2
Pompeii		17·1	280	—	—	9 40	+140	29·7	—
Rocca di Papa		18·4	284	—	—	—	—	e 11·2	11·7
Florence		19·4	290	(4 45)	+11	4 45	?P	—	11·2
Innsbruck		19·8	300	—	—	—	—	10·7	—
Zurich		21·7	299	—	—	i 9 5	+ 6	—	—
Moncalieri		22·0	293	—	—	8 49	−16	13·1	17·2
Strasbourg		22·5	302	e 7 2	?	9 13	− 2	12·7	16·6
Hamburg		22·7	316	e 5 16	+ 3	—	—	e 13·7	16·0
Upsala		23·3	335	5 26	+ 6	9 42	+11	—	17·4
Besançon		23·4	298	2 55?	?	9 42	+ 9	—	14·7
Marseilles		23·7	289	e 5 28	+ 3	e 9 40	+ 2	12·7	13·7
De Bilt	E.	24·9	310	5 41	+ 4	10 7	+ 6	e 11·7	17·4
Uccle		25·1	307	e 5 40	+ 1	e 10 7	+ 2	11·9	14·5
Puy de Dôme		25·4	295	e 5 18	−24	e 10 14	+ 3	14·6	—
Paris		25·9	302	e 5 20	−27	—	—	13·7	18·6
Barcelona		26·3	285	e 5 52	+ 1	—	—	e 14·3	19·6
Algiers		26·6	274	e 5 58	+ 4	e 10 58	+25	e 15·7	19·2
Tortosa		27·6	284	6 8	+ 4	11 53	+61	11·9	17·0
Kew		28·0	307	—	—	—	—	—	21·7
Bergen		28·2	327	6 34	+24	—	—	16·7	—
Oxford		28·7	307	6 14	− 1	11 4	− 8	—	20·3
Stonyhurst		29·8	310	e 11 28	?S	(e 11 28)	− 3	—	23·7
Bidston		30·1	310	9 46	+197	16 15	?L	(16·2)	25·0
Eskdalemuir		30·5	314	—	—	11 10	−33	15·7	—
Edinburgh		30·6	314	—	—	e 8 55	?PR$_1$	17·7	22·3
Toledo		31·2	281	e 5 49	−51	e 10 55	−59	e 15·6	22·7
Simla		33·6	92	—	—	—	—	e 13·7	—
San Fernando		33·8	277	7 10	+ 7	11 10	−88	—	25·2
Coimbra		34·4	283	12 27	?S	(12 27)	−19	18·2	24·8
Lisbon		35·3	284	—	—	—	—	e 17·1	—
Kodaikanal		46·6	119	28 46	?L	—	—	(28·8)	—
Colombo		50·6	120	26 10	?L	—	—	(26·2)	32·7
Ottawa		75·6	319	e 12 4	+11	(e 22 10)	+37	35·7	—
Cape Town		75·9	196	39 30	?L	—	—	(39·5)	48·0
Chicago		84·1	322	—	—	e 22 40	−29	42·7	—
Victoria	E.	89·9	347	14 35	+80	—	—	42·2	54·1
	N.	89·9	347	14 35	+80	—	—	51·7	60·5

Additional readings: Athens gives also MN = +6·8m. Lemberg ePN = +2m.40s. Vienna MN = +13·2m., P is given as S, and S as i. Rocca di Papa eLN = +10·3m. Florence S = +4m.49s. Moncalieri MN = +15·4m. Strasbourg MN = +13·5m. Hamburg MNZ = +20·7m. Upsala MN = +16·9m. De Bilt PZ = +15m.40s., MN = +15·5m., MZ = +17·5m. Paris e = +4m.18s. Tortosa PN = +6m.13s. Toledo MNW = +22·5m. San Fernando MN = +20·2m. Coimbra S = +14m.55s., MN = +22·7m. Ottawa eS is given as eL.

April 29d. Readings also at 0h. (Zi-ka-wei), 2h. (Berkeley), 9h. (near Zurich and near Belgrade), 10h. (Sarajevo), 12h. (Strasbourg and near Mizusawa), 13h. (2), 14h., and 16h. (Sarajevo), 17h. (La Paz and Sarajevo), 18h. (Sarajevo), 19h. (Ottawa), 20h. (Sinj), 21h. (La Paz), 22h. (Nagasaki), 23h. (Florence).

April 30d. 4h. 34m. 50s. (I) } Epicentre 43°·5N. 16°·5E.
23h. 31m. 40s. (II) } (as on 29d. and as given by De Bilt).

A = +·696, B = +·206, C = +·688 ; D = +·284, E = −·959 ;
G = +·660, H = +·195, K = −·725.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
II	Sinj	0·3	7	i 0 22	+17	—	—	—	0·5
I	Mostar	1·0	99	e 0 5	−10	i 0 26	− 2	—	0·9
II		1·0	99	i 0 26	+11	i 0 46	+18	—	1·0
I	Sarajevo	1·5	75	e 0 21	− 2	e 0 50	+ 8	—	1·0
II		1·5	75	i 0 28	+ 5	i 0 54	+12	—	1·1
II	Pompeii	3·1	208	0 57	+ 8	1 47	+21	—	2·0
I	Belgrade	3·1	65	e 1 19	+30	e 2 9	+43	—	—
II		3·1	65	i 0 51	+ 2	i 1 32	+ 6	(i 1·8)	1·9
I	Rocca di Papa E.	3·3	238	e 0 46	− 6	i 1 38	+ 7	—	1·8
I	N.	3·3	238	e 0 40	−12	i 1 43	+12	—	1·8
II		3·3	238	i 0 40	−12	i 1 30	− 1	—	1·9
II	Venice	3·5	304	−0 34	−89	—	—	—	0·2
I	Innsbruck	5·1	318	—	—	e 2 4	−16	—	—
II		5·1	318	e 1 6	−13	e 2 23	+ 3	—	—
II	Moncalieri	6·4	286	1 22	−16	4 0	?	4·7	—
I	Zurich	6·8	307	e 1 45	+ 1	—	—	—	—
II		6·8	307	e 1 27	−17	i 2 35	−30	—	—
II	Strasbourg	7·9	313	1 38	−22	e 3 40	+ 6	4·2	—
II	Besançon	8·3	301	1 45	−21	—	—	—	—
II	Paris	11·0	304	—	—	e 4 38	−16	e 6·6	7·3
II	Uccle	11·0	316	—	—	—	—	e 5·5	—
II	Hamburg	11·0	339	—	—	—	—	e 5·3	—
II	De Bilt	11·5	322	—	—	—	—	e 5·6	6·3
II	Upsala E.	16·4	2	—	—	—	—	e 8·8	—
II	Edinburgh	17·7	321	—	—	—	—	—	12·3
II	Ekaterinburg	30·6	49	—	—	—	—	17·3	—

Additional readings: Belgrade gives also I eP = +1m.45s., II iP = +1m.1s., MN = +2·2m. Rocca di Papa II iPN = +42s. Strasbourg II e = +2m.5s. Paris II e = +5m.49s., MN = +8·3m.

April 30d. 19h. 51m. 30s. Epicentre 1°·0N. 143°·5E. (as on 1918 Mar. 14d.).

A = −·804, B = +·595, C = +·017 ; D = +·595, E = +·804 ;
G = −·014, H = +·011, K = −1·000.

Very doubtful.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	26·1	303	e 5 52	+ 3	(9 58)	−26	10·0	—
Riverview	35·6	169	—	—	e 18 39	?L	(e 18·6)	19·7
Sydney	35·6	169	12 42	?S	(12 42)	−22	18·6	20·7
Adelaide	36·2	187	—	—	—	— e	16·0	19·0
Ekaterinburg	85·2	327	—	—	e 23 12	− 9	44·5	—
Victoria E.	91·4	42	—	—	—	—	44·8	52·1
De Bilt	116·5	333	—	—	—	—	e 63·5	—
Edinburgh	116·9	340	—	—	—	—	e 66·5	—
Eskdalemuir	117·4	339	—	—	—	—	63·5	—
Strasbourg	117·4	329	—	—	—	—	e 68·5	—
Florence	118·2	321	4 18	?	—	—	—	57·0
Paris	119·9	332	—	—	—	—	e 66·5	—
Toronto	121·2	35	—	—	—	—	69·1	—
Ottawa	122·1	31	—	—	—	—	e 63·5	—
La Paz	145·2	118	20 0 [+12]	—	—	—	75·6	—

Additional readings: Riverview gives also e = +14m.54s., MN = +21·4m. Adelaide e = +18m.18s. Ottawa L = +80·0m.

April 30d. Readings also at 0h. (La Paz and Rocca di Papa), 4h. and 7h. (Nagasaki), 9h. (near Batavia and Malabar), 12h. (near Batavia and Malabar), 13h. (La Paz, Mendoza, Cipolletti, and Andalgala), 14h. (Paris), 15h. (Sarajevo and near Batavia and Malabar), 16h. (Toronto, Washington, Victoria, Ottawa, and near Sarajevo), 17h. (Paris), 18h. (Rocca di Papa and near Zurich), 19h. (near Balboa Heights), 22h. (Vienna), 23h. (Sarajevo and Rocca di Papa).

May 1d. 10h. 36m. 10s. Epicentre 55°·0S. 24°·0W.

$A = +·524$, $B = -·233$, $C = -·819$; $D = -·407$, $E = -·914$; $G = -·748$, $H = +·333$, $K = -·574$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Rio de Janeiro	E.	35·1	329	i 7 13	− 1	13 20	+23	14·9	18·2
	N.	35·1	329	e 7 35	+21	13 20	+23	14·9	18·1
Capetown		36·1	72	7 23	0	13 10	− 1	—	16·2
Mendoza		37·9	288	13 8	?S	(13 8)	−29	20·3	20·8
Andalgala	N.	40·9	295	6 32	−90	—	—	12·9	28·2
La Paz		51·2	302	i 9 9	− 5	i 16 23	−11	26·4	28·7
San Fernando		92·7	14	—	—	—	—	—	56·6
Rio Tinto		93·9	14	22 50	?S	(22 50)	−125	—	54·8
Algiers		94·7	22	e 13 30	−12	24 3	[+ 8]	e 36·8	47·8
Coimbra		96·1	13	e 14 0	+10	e 24 56	[+53]	e 43·8	—
Toledo		96·4	16	—	—	24 8	[+ 4]	e 31·7	—
Tortosa	N.	98·1	20	i 18 14	?PR_1	i 24 21	[+ 7]	32·2	48·6
Rocca di Papa	E.	101·6	29	i 18 23	?PR_1	32 8	?SR_1	e 54·6	64·9
	N.	101·6	29	i 18 53	?PR_1	32 56	?SR_1	—	—
Puy de Dôme		103·3	20	e 13 50	−37	—	—	—	—
Moncalieri		103·6	24	e 18 53	?PR_1	27 8	+39	52·8	—
Georgetown		104·3	320	e 17 50	?PR_1	e 24 39	?	—	—
Kodaikanal		104·9	93	56 56	?L	—	—	(56·9)	—
Paris		106·2	19	—	—	e 26 3	−51	52·8	59·8
Zagreb		106·4	30	e 19 44	?PR_1	e 20 14	?	e 52·8	—
Batavia		106·6	130	e 19 25	?PR_1	i 25 37	[+42]	—	—
Strasbourg		106·9	22	19 23	?PR_1	28 53	+113	43·8	—
Kew		108·3	15	—	—	—	—	—	59·8
Uccle		108·4	20	—	—	e 28 44	+90	e 52·8	—
Vienna		108·7	28	e 18 37	?PR_1	29 3	+107	—	58·3
Ottawa		109·5	326	e 18 50	?PR_1	e 34 28	?SR_1	58·6	—
De Bilt		109·8	20	—	—	—	—	e 53·8	60·4
Bidston		109·8	14	21 50	?PR_1	30 11	?	—	59·0
Chicago		110·9	314	14 30	−32	24 55	[−19]	43·8	—
Eskdalemuir		111·7	12	—	—	29 36	+113	52·8	—
Hamburg		112·1	22	e 19 50	?PR_1	—	—	e 54·8	—
Edinburgh		112·2	12	—	—	e 27 50	+ 2	—	—
Upsala		119·5	23	—	—	e 27 50	−56	e 57·8	—
Ekaterinburg		131·0	46	e 19 22	[+ 1]	28 23	?	37·8	—
Manila		131·4	134	e 21 39	?PR_1	—	—	—	—
Victoria		132·4	299	39 16	?SR_1	—	—	60·4	65·3
Zi-ka-wei		145·9	123	i 19 41	[− 9]	e 36 5	?	—	71·5

Additional readings and notes: Mendoza readings have increased by 30m. La Paz gives alternative $iS = +16m.45s$. $T_0 = 10h.35m.48s$. Zagreb $eE = +34m.50s$. All readings have been increased by 1h. Batavia $i = +24m.45s$. Vienna $i = +30m.0s$. Readings given as for 2d. Uccle $e = +34m.50s$. Ottawa $e = +24m.50s$., $eL = +41·3m$. De Bilt $eZ = +15m.8s$. and $+19m.14s$., $e = +29m.2s$., $MN = +54·4m$., $MZ = +54·5m$. Eskdalemuir $eSR_1? = +35m.36s$. Ekaterinburg $i = +21m.43s$.

May 1d. Readings also at 0h. (Lick), 1h. (near Zagreb), 2h. (Manila (2) and Nagasaki), 4h. (Vienna), 5h. and 8h. (Nagasaki), 9h. (La Paz), 12h. (Ekaterinburg), 16h. (La Paz and near Balboa Heights), 18h. and 23h. (Vienna).

May 2d. 16h. 23m. 36s. Epicentre 50°·0N. 128°·0W. (as on 1920 Nov. 28d.).

$A = -·396$, $B = -·507$, $C = +·766$; $D = -·788$, $E = +·616$; $G = -·472$, $H = -·604$, $K = -·643$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria	E.	3·4	114	0 53	0	1 31	− 3	2·2	4·4
	N.	3·4	114	0 59	+ 6	1 29	− 5	2·4	3·2
	Z.	3·4	114	0 56	+ 3	—	—	—	4·2
Sitka		8·3	331	—	—	—	—	e 4·5	5·1
Chicago		28·9	91	11 8	?S	(11 8)	− 7	(15·2)	—
Ann Arbor		31·1	88	e 9 24	?	—	—	17·7	—
Toronto		33·4	81	—	—	—	—	21·9	22·2
Ottawa		34·8	77	—	—	e 12 39	−13	e 17·9	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ithaca	35·7	82	—	—	—	—	e 19·4	—
Georgetown	37·2	88	—	—	—	—	e 19·4	—
Washington	37·2	88	—	—	—	—	20·4	—
Honolulu N.	37·2	231	—	—	—	—	e 15·9	18·3
Edinburgh	64·7	32	—	—	—	—	e 32·4	—
Eskdalemuir	65·1	32	—	—	—	—	26·4	—
Stonyhurst	66·5	33	e 36 24	?L	—	—	(36·4)	38·4
Bidston	66·7	33	—	—	40 24	?	—	54·4
Oxford	68·7	34	—	—	—	—	—	39·1
De Bilt E.	70·5	29	—	—	—	—	e 34·4	44·4
N.	70·5	29	—	—	—	—	e 36·4	43·9
Uccle	71·4	30	—	—	—	—	e 33·4	—
Paris	72·5	33	—	—	—	—	e 40·4	—
Ekaterinburg	73·0	356	—	—	—	—	46·4	—
Strasbourg	74·4	30	—	—	—	—	e 39·4	—
Moncalieri	77·5	31	—	—	—	—	e 40·8	—
Rocca di Papa	82·0	28	—	—	—	—	e 44·8	54·3

Additional readings and notes: Sitka gives also MN = +5·5m. Ottawa e = +11m.16s., L = +18·4m. Ithaca e = +14m.24s., L = +20·2m. Georgetown e = +17m.24s., LE = +21·4m., LN = +23·1m. Washington e = +16m.24s. Stonyhurst readings have been diminished by 1h. De Bilt MZ = +44·8m. Moncalieri L = +47·4m.

May 2d. Readings also at 0h. (Lick (3) and Nagasaki), 5h. (Zi-ka-wei and Manila), 14h. (Mizusawa), 17h. (near Malabar and Batavia), 18h. (De Bilt and Uccle), 19h. (De Bilt, Uccle, Taihoku, La Paz, Zi-ka-wei, Hong Kong, Strasbourg, and Ekaterinburg), 20h. (Algiers), 22h. (Nagasaki (3)), 23h. (Manila).

May 3d. 14h. 5m. 20s. Epicentre 42°·3N. 17°·8E. (as on 1918 June 29d.).

A = +·704, B = +·226, C = +·673.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Sarajevo	1·6	i 0 41	+17	i 1 3	+18	—	1·2
Belgrade	3·2	e 0 42	− 8	i 1 29	+ 1	—	1·9
Rocca di Papa	3·8	e 0 58	− 1	1 40	− 4	2·0	2·2
Zagreb	4·0	(i 1 6)	−14	i 1 6	?P	—	1·4
Vienna	6·0	e 2 1	+29	—	—	—	3·0

Additional readings: Rocca di Papa gives also iPN = +1m.34s., iPE = +1m.40s. Zagreb MNW = +1·6m.

May 3d. Readings also at 2h. (La Paz), 3h. (Nagasaki), 4h. (Zi-ka-wei and near Hokoto), 9h. (near Algiers), 11h. (near Sarajevo), 14h. (near Mizusawa), 15h. (near Sarajevo), 16h. (Nagasaki), 17h. (Manila and near Zagreb), 19h. (Zagreb (2)), 22h. (Nagasaki and Zagreb).

May 4d. 10h. 41m. 0s. Epicentre 23°·2N. 120°·6E.

A = −·468, B = +·791, C = +·394; D = +·861, E = +·509; G = −·201, H = +·339, K = −·919.

This epicentre was adopted from the following note, the reference to which has been unfortunately mislaid: The origin of the earthquake which occurred on the 4th May, 1923, at 18h.41m.32s. (120th meridian time), lay approximately at 23°11′N. and 120°35′E. at a distance of about 30 km. to the N.E. from Tainan in S. Formosa. Its intensity is presumed to be VII-VIII (Rossi-Forel), causing a little damage, but the region which felt such intensity was limited to a small part, as the intensity at Tainan decreased to III-IV. No aftershock felt at the latter station.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	2·0	25	0 32	+ 1	—	—	1·1	1·3
Hong Kong	6·0	262	1 10	−22	—	—	—	7·0
Zi-ka-wei	8·0	5	2 24	+23	e 3 34	− 3	—	4·5
Manila	8·6	178	e 2 0	−10	—	—	—	—
De Bilt	86·1	326	—	—	—	—	e 47·0	—
Strasbourg	86·6	322	—	—	—	—	e 49·0	—

Additional readings: Taihoku MN = +1·4m. Zi-ka-wei MN = +4·4m., MZ = +4·6m.

1923. May 4d. 16h. 26m. 32s. Epicentre 54°·5N. 156°·5W.

A = −·533, B = −·232, C = +·814 ; D = −·399, E = +·917 ;
G = −·747, H = −·325, K = −·581.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		12·1	69	2 52	− 8	5 1	−20	e 6·3	12·7
Victoria	E.	21·3	93	4 58	+ 1	(9 7)	+17	9·1	11·4
	N.	21·3	93	4 59	+ 2	(9 5)	+15	9·1	11·0
Berkeley	E.	28·4	114	e 6 11	− 1	i 11 14	+ 8	e 14·0	14·7
	N.	28·4	114	e 6 20	+ 8	i 11 10	+ 4	e 14·0	14·4
	Z.	28·4	114	e 6 11	− 1	i 11 21	+15	e 13·8	14·6
Honolulu	E.	33·2	183	7 4	+ 6	i 12 28	+ 1	16·0	18·2
	N.	33·2	183	i 7 1	+ 3	—	—	16·2	18·9
Denver		37·1	92	14 28	?S	(14 28)	+63	20·5	24·5
Ootomari		38·1	284	6 24	−75	12 25	−74	16·3	22·2
Tucson	E.	38·9	105	7 48	+ 3	13 47	− 4	18·5	21·4
	N.	38·9	105	e 7 52	+ 7	e 14 2	+11	20·4	21·5
Sapporo		41·1	280	17 41	?SR_1	—	—	23·9	30·4
Hakodate		42·2	279	7 40	−32	14 58	+20	20·4	—
Mizusawa	E.	43·8	276	8 19	− 5	14 44	−15	—	—
	N.	43·8	276	8 16	− 8	14 46	−13	20·1	—
Chicago		45·7	78	8 34	− 4	15 3	−21	21·3	—
Ann Arbor		47·5	75	8 46	− 5	15 40	− 8	22·8	29·1
Nagoya		48·9	276	8 53	− 6	—	—	—	—
Toronto		49·0	70	11 22	+142	17 10	+64	27·6	31·9
Ottawa		49·8	65	9 3	− 3	16 13	− 3	e 22·5	26·6
Osaka		50·1	277	9 4	− 4	(16 18)	− 2	16·3	16·5
Ithaca		51·4	70	e 9 12	− 4	16 32	− 4	27·8	—
Northfield		52·3	65	9 16	− 6	16 38	−10	28·0	—
Georgetown	E.	53·5	73	e 9 30	0	17 2	− 1	e 24·9	30·5
Washington		53·5	73	16 53	?S	(16 53)	−10	34·0	—
Cheltenham	E.	53·8	73	—	—	17 17	+11	26·3	30·9
	N.	53·8	73	—	—	17 13	+ 7	24·1	31·4
Nagasaki		54·8	279	e 9 26	−12	—	—	—	36·8
Zi-ka-wei		60·7	283	i 10 14	− 3	e 18 24	− 8	e 27·6	31·8
Bergen		64·2	10	10 43	+ 4	19 14	− 1	31·5	—
Ekaterinburg		64·7	339	i 10 43	0	19 18	− 3	32·5	41·8
Taihoku		65·3	280	23 44	?	30 53	?	36·9	—
Upsala		65·6	4	i 10 39	−10	i 19 21	−11	e 23·5	47·2
Edinburgh		67·5	17	e 11 4	+ 3	e 19 57	+ 1	32·5	44·1
Eskdalemuir		68·0	17	i 11 6	+ 2	i 20 4	+ 2	32·5	35·8
Stonyhurst		69·6	17	e 9 28	−107	i 20 28	+ 7	—	47·5
Bidston		69·9	17	13 28	+132	22 28	+123	—	44·6
Hamburg		71·4	9	i 11 26	0	e 20 41	− 2	31·5	54·2
Hong Kong		71·6	282	11 30	+ 3	20 50	+ 5	33·1	50·5
Oxford		71·8	17	i 11 34	+ 6	i 20 47	− 1	29·0	45·9
Kew		72·2	16	11 28	− 3	—	—	—	46·5
De Bilt		72·4	11	i 11 33	+ 1	20 56	+ 1	e 34·5	47·0
Uccle		73·5	12	11 38	− 1	21 6	− 2	e 33·5	47·7
Manila		73·9	273	e 11 47	+ 6	21 11	− 2	34·5	34·5
Paris		75·2	15	i 11 51	+ 1	i 21 25	− 3	33·5	39·5
Lemberg		75·7	0	e 11 40	−13	—	—	e 39·6	50·6
Le Mans		75·7	16	e 16 28	?PR_1	i 23 28	?	—	—
Porto Rico	N.	75·9	78	—	—	e 16 11	?PR_1	e 34·7	—
Strasbourg		76·1	10	11 50	− 6	21 37	− 1	e 33·5	42·9
Vienna		77·2	5	11 58	− 4	21 46	− 5	e 33·5	56·0
Besançon		77·3	12	12 3	0	21 54	+ 2	—	41·5
Zurich		77·4	10	e 11 51	−12	e 21 49	− 4	—	—
Innsbruck		77·7	9	i 12 0	− 5	e 21 55	− 2	e 35·0	50·3
Puy de Dôme		78·3	15	12 12	+ 3	22 4	0	32·5	49·5
Zagreb		79·5	5	i 12 13	− 3	e 22 8	−10	39·5	48·7
Moncalieri		79·7	11	i 12 14	− 3	i 22 14	− 6	36·5	59·7
Belgrade		80·7	2	e 12 9	−14	i 22 19	−12	e 39·1	59·0
Marseilles		81·0	13	12 28	+ 3	22 28	− 7	40·0	51·5
Florence		81·2	9	12 28	+ 2	22 33	− 4	—	44·0
Coimbra	E.	81·5	25	12 30	+ 2	22 26	−15	36·5	42·6
	N.	81·5	25	—	—	i 22 41	0	38·0	46·9
Tiflis		82·2	345	e 12 34	+ 3	e 22 58	+10	e 39·5	49·7
Barcelona		82·4	16	12 34	+ 2	22 45	− 5	e 35·8	50·9
Tortosa	E.	82·7	18	—	—	22 46	− 8	35·6	52·6
	N.	82·7	18	i 12 31	− 3	i 22 49	− 5	34·4	52·8
Lisbon		82·7	26	12 32	− 2	22 44	−10	37·7	40·2
Toledo		82·8	21	i 12 32	− 3	i 22 48	− 7	e 34·7	48·2

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Simla	E.	82·8	318	12 58	+23	22 40	−15	44·4	48·3
	N.	82·8	318	12 40?	+ 5	22 58?	+ 3	50·5	55·6
Rocca di Papa	E.	83·4	8	i 12 34	− 4	22 58	− 3	44·7	66·2
Pompeii	E.	84·5	7	e 12 48	+ 3	23 18	+ 4	43·5	56·5
Calcutta	E.	85·2	304	23 18	?S	(23 18)	− 3	—	53·0
Granada		85·4	22	i 12 46	− 4	i 23 17	− 6	38·0	40·3
San Fernando	N.E.	85·6	24	12 46	− 5	23 10	−16	—	52·0
Algiers		87·1	17	12 52	− 8	23 28	−14	41·5	46·0
Athens		87·7	0	e 12 48	−15	i 23 32	−17	e 40·5	52·8
Bombay		95·4	315	17 7	?PR_1	27 15	+125	49·5	58·4
Helwan		95·4	354	13 38	− 7	24 48	−22	—	69·0
Wellington		98·9	201	—	—	e 24 10	[− 8]	i 47·9	50·5
		98·9	201	—	—	i 24 27	[+ 9]	47·6	57·5
Batavia		99·0	273	—	—	i 25 27	−19	e 35·8	49·8
Riverview		99·1	222	—	—	e 24 20	[+ 1]	e 46·3	53·2
Sydney		99·1	222	24 28	?S	(24 28)	[+ 9]	48·7	54·4
Kodaikanal		101·0	307	24 28	?S	(24 28)	[− 1]	54·5	61·4
La Paz		102·4	101	e 15 2	+40	e 27 2	+43	46·6	65·2
Colombo		102·8	303	14 52	+28	26 46	+24	55·5	66·5
Melbourne		105·0	224	—	—	25 58	−44	—	52·9
Adelaide		105·3	230	e 20 16	?PR_1	e 28 40	+115	i 52·5	63·0
La Quiaca	N.	108·3	103	32 52	?SR_1	—	—	—	76·2
Andalgala	N.	112·3	105	14 58	−10	(24 34)	[−45]	24·6	72·3
Perth		114·2	249	—	—	25 58	[+31]	—	—
Mendoza		115·2	110	29 16	?S	(29 16)	+64	—	66·0
Pilar	E.	116·7	106	23 52	?	—	—	—	134·3
	N.	116·7	106	25 46	?	—	—	—	91·7
Accra		116·8	26	6 28	?	—	—	—	72·5
Cape Town		159·1	12	24 10	?PR_1	—	—	—	99·1

Additional readings: Sitka gives also eN = +3m.37s., SE = +5m.30s. (O−C = +9s.), LN = +7·7m. T_0 = 16h.26m.46s. Berkeley PR_1Z = +6m.52s. and +7m.24s., eSE = +11m.6s., iSZ = +11m.38s. All readings given as for 22h. Honolulu iPR_1E = +8m.21s., PR_1N = +8m.15s., eN = +9m.26s., SR_1E = +14m.23s., SR_1N = +14m.20s., SR_2N = +14m.39s., LE = +15·1m. Ootomari MN = +20·3m. Tucson LE = +16·9m., LN = +17·8m. T_0 = 16h.26m.47s. Ann Arbor PR_1 = +10m.40s., MN = +28·8m. T_0 = 16h.26m.42s. Toronto i = +21m.22s. Ottawa PR_1 = +11m.2s., PR_2 = +11m.35s., i = +18m.36s., SR_1 = +20m.5s., SR_2 = +20m.58s. T_0 = 16h.26m.34s. Osaka MN = +17·1m. Ithaca i = +19m.1s., e = +20m.7s., L = +24·5m. Georgetown ePN = +9m.31s., MN = +31·0m. Washington S = +24m.40s., SR_1 = +28m.28s. Cheltenham eE = +10m.56s., eE = +19m.34s., eN = +20m.4s., and several L readings. Zi-ka-wei SR_1 = +24m.2s., MZ = +32·1m., MN = +32·3m. Ekaterinburg i = +14m.59s., SR_1 = +24m.24s., SR_2 = +26m.51s., SR_3 = +27m.58s. Upsala MN = +39·2m. Edinburgh SR_2 = +27m.40s. Eskdalemuir PR_1N = +13m.43s., PR_2N = +15m.17s., MN = +36·0m. Hamburg LZ = +36·0m., MNZ = +40·5m. De Bilt iPR_1Z = +14m.10s., eSR_1 = +25m.41s. MN = +41·6m., MZ = +43·5m. Uccle PR_1 = +14m.34s., SR_1 = +25m.34s., SR_2 = +29m.4s., MN = +40·1m. Manila MN = +44·0?m. Porto Rico eE = +14m.17s. All readings diminished by 1h. Strasbourg eL = +35·5m., MN = +43·3m. Vienna iP = +12m.3s., PR_1 = +14m.52s., PS = +22m.30s., MZ = +47·0m. Innsbruck MNW = +57·6m. Zagreb e = +12m.56s., +13m.44s., and +22m.22s., MNW = +53·6m. Moncalieri MN = +54·4m. Belgrade iP = +12m.11s., PR_1 = +13m.8s. and +15m.30s., SR_1 = +23m.35s. Coimbra i = +22m.41s., SR_1 = +28m.0s. T_0 = 16h.27m.4s. Epicentre 54°N. 155°W. Tiflis eN = +12m.16s., eE = +12m.40s., eE = +22m.34s., iN = +26m.6s. Barcelona MN = +51·7m. Toledo PR_1NE = +15m.43s., PR_1NW = +15m.40s., PR_2 = +17m.41s., PR_2NE = +19m.9s., PR_2NW = +19m.15s., SR_1NE = +25m.26s., SR_1NW = +25m.25s., SR_2NE = +28m.12s., SR_2NW = +28m.19s. Rocca di Papa SN = +22m.28s., iS = +23m.7s., LE = +27·9m., LN = +28·3m. Calcutta PN = +22m.56s., MN = +54·3m. Granada i = +12m.53s., i = +38m.34s., MN = +51·4m. Athens i = +13m.1s., PR_1 = +16m.21s., S = +23m.16s., MN = +48·2m. Wellington ePR_2 = +17m.58s., SR_1 = +31m.34s., +42m.16s., +43m.16s., and +45m.40s. Batavia eE = +17m.16s., iE = +17m.46s. Riverview PS = +25m.22s., eSR_1 = +31m.56s., and +33m.30s., e = +41m.10s., and +42m.10s., MNZ = +51·8s. Sydney S = +33m.34s. La Paz i = +24m.37s., iS = +27m.27s. Colombo L = +61·6m. P has been increased by 10m. Adelaide SR_1 = +35m.40s., eSR_2 = +40m.4s., and several e and i readings.

May 4d. 17h. 30m. 28s. Epicentre 42°·0N. 141°·0E. (as on 1920 June 25d.).

A = −·577, B = +·467, C = +·669.

		Δ	P.	O−C.	S.	O−C.	L.	M.
		°	m. s.	s.	m. s.	s.	m.	m.
Hakodate		0·3	0 1	− 4	—	—	0·2·	0·3
Sapporo		1·1	0 20	+ 3	(0 32)	+ 1	0·5	—
Mizusawa	E.	2·9	0 44	− 1	1 22	+ 2	—	—
Nagasaki		12·8	3 16	+ 6	—	—	—	—
Manila		32·4	e 4 1	?	—	—	—	—
Perth		77·5	—	—	22 2	+ 7	—	—

Mizusawa gives also SN = +1m.21s. Nagasaki reading has been increased by 2h.

May 4d. 22h. 26m. 40s. Epicentre 28°·5S. 71·°5W. (as on 1922 July 28d.).

A = +·279, B = −·833, C = −·477; D = −·948, E = −·317;
G = −·151, H = +·453, K = −·879.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Andalgala	N.	4·7	80	−4 16	?	—	—	6·5	7·3
Mendoza		5·2	150	8 50	?	—	—	9·4	11·5
Pilar	N.	7·3	117	1 50	− 1	—	—	3·5	4·2
La Quiaca	E.	8·2	41	1 38	−26	—	—	3·8	4·3
	N.	8·2	41	1 44	−20	—	—	4·2	5·0
Cipolletti		10·8	166	1 20	−81	—	—	3·3	5·2
La Paz		12·4	15	i 3 7	+ 2	i 5 31	+ 2	6·8	7·3
Chacarita		12·7	122	—	—	—	—	—	13·7
La Plata	E.	13·2	122	i 3 9	− 7	5 50	+ 1	6·9	7·9
	N.	13·2	122	i 3 10	− 6	5 58	+ 9	6·6	8·3
Porto Rico	E.	47·0	9	e 11 47	?PR_1	—	—	—	—
Georgetown		67·6	357	e 10 46	−16	20 31	+34	—	—
Washington		67·6	357	18 34	?	27 18	?	39·3	—
Ithaca		71·1	358	e 11 32	+ 8	e 20 26	−13	32·3	—
Ann Arbor		71·7	352	11 50	+22	21 14	+28	33·3	—
Chicago		71·8	349	11 52	+24	20 26	−22	32·3	—
Toronto		72·6	355	11 49	+15	20 38	−19	34·1	—
Ottawa		74·0	359	11 40	− 2	21 1	−13	e 34·3	—
Cape Town		74·5	122	11 47	+ 1	20 59	−21	—	21·0
Wellington		87·1	225	e 12 44	−16	e 23 14	[+ 4]	e 42·7	—
Lisbon		88·8	44	e 13 5	− 4	23 11	[−10]	—	—
San Fernando		89·3	48	13 18	+ 6	23 10	[−14]	—	24·3
Victoria	E.	89·8	330	13 41	+26	23 19	[− 8]	40·8	54·5
	N.	89·8	330	13 38	+23	23 21	[− 6]	40·9	52·9
Coimbra		90·2	43	13 29	+12	i 23 25	[− 4]	41·8	—
Granada		91·4	49	i 13 24	+ 1	i 23 56	[+20]	—	—
Toledo		92·7	45	13 36	+ 5	23 33	[−11]	39·0	50·3
Tortosa	N.	96·1	47	13 52	+ 2	24 0	[− 3]	39·1	60·0
Algiers		96·5	51	e 13 48	− 4	23 50	[−15]	e 39·3	48·8
Honolulu	N.	97·2	291	—	—	e 25 5	[− 5]	—	72·8
Puy de Dôme		100·2	44	—	—	e 24 20	[− 5]	—	—
Marseilles		100·5	47	—	—	e 24 20	[− 6]	—	—
Oxford		101·0	38	18 22	?PR_1	25 1	[+32]	42·3	53·2
Bidston		101·0	36	27 44	?S	25 56	− 9	—	45·3
Kew		101·4	38	—	—	—	—	—	65·3
Paris		101·5	41	—	—	e 24 21	[−10]	43·3	63·3
Stonyhurst		101·6	36	e 18 20	?PR_1	(26 20)	+ 9	—	45·3
Eskdalemuir		102·0	33	e 14 17	− 3	i 24 23	[−11]	43·3	—
Edinburgh		102·3	33	(14 26)	+ 4	14 26	?P	47·3	—
Moncalieri		102·8	46	e 14 53	+29	24 22	[−15]	33·5	56·9
Uccle		103·6	39	e 14 22	− 6	e 24 29	[−12]	e 44·3	55·3
Strasbourg		104·4	43	e 17 20	?PR_1	24 33	[−12]	33·3	—
Rocca di Papa		104·5	51	14 32	0	24 38	[− 7]	e 27·3	67·7
De Bilt		104·6	38	e 14 29	− 3	e 24 36	[− 9]	e 47·3	56·5
Pompeii	E.	105·4	52	18 20	?PR_1	—	—	—	—
Riverview		105·8	217	e 18 30	?PR_1	e 24 39	[−12]	e 27·8	34·6
Hamburg		107·8	40	e 18 20	?PR_1	e 24 50	[−10]	e 46·3	—
Zagreb		108·8	49	—	—	e 19 9	?PR_1	—	—
Vienna		109·5	45	e 18 19	?PR_1	28 55	+91	—	56·3
Belgrade		111·0	50	e 16 36	+94	e 27 20	−17	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Upsala	113·9	34	e 19 43	?PR_1	e 29 22	+81	e 51·3	—
Ekaterinburg	136·2	37	19 48	[+16]	28 45	?	61·3	75·3
Batavia	145·3	178	19 20	[−29]	—	—	—	—
Colombo	145·4	125	20 20	[+31]	—	—	—	85·3
Manila	161·9	222	20 3	[− 6]	—	—	—	—
Zi-ka-wei	168·5	286	20 6	[− 8]	—	—	—	58·3

Additional readings and notes: Pilar gives also ME = +4·3m. Chacarita MN = +13·6m. Porto Rico eN = +3m.15s. and +12m.13s. All readings given as at 23h. Georgetown eN = +10m.56s. Toronto i = +20m.46s., e = +29m.35s., L = +34·4m. Ottawa SR_1? = +29m.20s., L = +43·3m. T_0 = 22h.26m.50s. Wellington e = +21m.32s. and +37m.38s. T_0 = 22h.26m.38s.; also another set of readings. San Fernando PEN = +13m.20s., MN = +29·3m. Coimbra eLN = +38·3m. Tortosa SE = +24m.11s. Stonyhurst S is given as M. Paris MN = +65·3m. Eskdalemuir e = +18m.37s. (?PR_1). Moncalieri MN = +44·1m. Uccle PR_1 = +18m.35s. Strasbourg i = +18m.41s. Rocca di Papa ePN = +15m.26s. and +16m.14s. De Bilt e = +18m.54s., MN = +49·0m. Riverview MN = +30·6m. Zagreb e = +19m.39s. and +21m.28s. Vienna iPZ = +19m.21s. Belgrade PR_1 = +19m.9s. Ekaterinburg i = +22m.23s. and +23m.19s., iPS = +29m.31s., i = +31m.26s., and +34m.29s. Zi-ka-wei readings are given for 5d.

May 4d. Readings also at 10h. (Mobile), 17h. (Granada), 19h. (Tortosa), 20h. (Ootomari).

May 5d. 15h. 4m. 5s. Epicentre 41°·1N. 126°·6W. (as on 1923 Mar. 11d.).

A = −·449, B = −·605, C = +·657; D = −·803, E = +·596; G = −·392, H = −·528, K = −·754.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Berkeley	E.	4·6	134	—	—	e 2 26	+20	e 2·5	3·7
	N.	4·6	134	e 1 20	+ 9	e 2 22	+16	e 2·7	4·0
Victoria	E.	7·7	17	1 51	− 6	—	—	4·2	5·0
	N.	7·7	17	1 51	− 6	—	—	3·8	6·0
Chicago		29·0	76	11 5	?S	(11 5)	−12	—	—
Ann Arbor		31·7	73	e 7 37	+53	—	—	—	—
Honolulu		33·1	243	—	—	—	—	e 14·9	16·6
Ottawa		36·7	66	—	—	e 13 7	−13	e 18·9	—
Georgetown	N.	37·5	76	—	—	e 13 55	+24	e 20·3	—
Eskdalemuir		72·2	30	—	—	—	—	30·9	—
De Bilt		77·8	28	—	—	—	—	e 38·9	—
Strasbourg		81·7	29	—	—	—	—	e 50·9	—
Rio Tinto		84·0	44	54 55	?L	—	—	(54·9)	64·4
Pompeii		90·9	28	e 39 55	?L	—	— (e 39·9)		—

Additional readings: Berkeley gives also several other L's. Honolulu MN = +16·4m. Ottawa L = +22·9m.

May 5d. Readings also at 0h. (Rocca di Papa), 4h. (Berkeley), 5h. (Nagasaki), 9h. (Victoria, Ottawa, and Georgetown), 10h. (near Hokoto), 15h. (Rocca di Papa), 19h. (near Sapporo, Hakodate, and Mizusawa), 22h. (Nagasaki), 23h. (Kodaikanal).

May 6d. 11h. 24m. 30s. Epicentre 35°·5N. 142°·0E. (as on 1922 Aug. 6d.).

A = −·642, B = +·501, C = +·581; D = +·616, E = +·788; G = −·458, H = +·358, K = −·814.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	3·7	350	0 59	+ 1	1 43	+ 1	—	—
Nagoya		4·2	266	0 18	−47	—	—	0·8	0·8
Osaka		5·4	263	1 13	−10	(2 1)	−27	2·0	2·6
Kobe		5·7	263	1 31	+ 3	(2 35)	− 1	2·6	3·7
Zi-ka-wei		17·7	262	—	—	e 7 38	+ 5	—	—

Additional readings and notes: Mizusawa gives also SN = +1m.45s., all readings having been decreased by 1m. Osaka MN = +2·5m. Kobe MN = +3·0m.

May 6d. 22h. 53m. 55s. Epicentre 35°·0N. 22°·5E. (as on 1922 July 22d.).

A = +·757, B = +·313, C = +·574 ; D = +·383, E = −·924, ; G = +·530, H = +·220, K = −·819.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·1	18	e 0 58	+ 9	(1 20)	− 6	1·3	2·0
Pompeii	8·5	315	e 3 12	+63	—	—	—	—
Belgrade	9·9	352	e 2 30	+ 1	e 4 14	−12	—	5·8
Rocca di Papa E.	10·2	314	e 2 11	−22	4 35	0	—	5·5
N.	10·2	314	e 2 35	+ 2	4 53	+18	—	—
Zagreb	11·9	337	—	—	e 5 38	+21	—	—
Vienna	14·0	343	e 3 53	+27	—	—	—	7·1
Strasbourg	17·4	326	e 4 5	− 5	—	—	—	—
Uccle	20·5	326	—	—	—	—	10·1	—
De Bilt	21·1	329	—	—	—	—	e 10·8	—

Athens gives also MN = +2·6m. Zante (Δ = 4°·1) gives simply 22h. 40m. Strasbourg reading is given as for 21h.

May 6d. Readings also at 12h. (Zi-ka-wei, Ekaterinburg, and Taihoku).

May 7d. 3h. 2m. 18s. (I) } Epicentre 36°·2N. 142°·2E.
13h. 10m. 48s. (II) }

A = −·638, B = +·495, C = +·591 ; D = +·613, E = +·790 ; G = −·467, H = +·362, K = −·807.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Mizusawa	3·0	344	0 47	0	1 20	− 3	—	—
II	3·0	344	0 33	−14	0 59	−24	—	—
I Nagoya	4·4	258	1 8	0	(2 2)	+ 1	2·0	2·3
II	4·4	258	1 10	+ 2	(1 57)	− 4	2·0	2·1
II Hakodate	5·7	349	1 28	0	(2 23)	−13	2·4	2·9
I Osaka	5·7	256	1 27	− 1	—	—	2·8	3·3
II	5·7	256	1 52	+24	—	—	3·1	3·6
I Kobe	5·9	257	1 34	+ 3	—	—	3·7	4·0
II	5·9	257	1 27	− 4	—	—	2·9	3·2
II Ekaterinburg	56·0	320	i 9 32	−14	—	—	—	—
II Hamburg	81·2	334	—	—	—	—	e 48·2	—
II De Bilt	84·1	335	—	—	—	—	e 43·2	—
II Strasbourg	86·1	332	—	—	—	—	e 47·2	—
II Rocca di Papa	89·5	326	42 30	?L	—	—	e 50·9	59·5

Additional readings : Mizusawa I gives also PN = +48s. Nagoya II MN = +2·3m. Hakodate II MN = +2·8m. Osaka I MN = +3·4m., II MN = +3·9m. Kobe II MN = +3·0m. De Bilt II MN = +44·2m. Rocca di Papa II L = +57·3m.

May 7d. Readings also at 0h. (near La Paz), 2h. (Nagasaki), 4h. (Nagasaki and Sapporo), 7h. (La Paz), 8h. (Sapporo), 9h. (Ekaterinburg), 10h. (Zi-ka-wei, Uccle, Strasbourg, and De Bilt), 12h. (Ekaterinburg), 13h. and 14h. (Zi-ka-wei), 17h. (Tiflis), 22h. (near Batavia and Malabar).

May 8d. Readings at 3h. (Zi-ka-wei), 14h. (La Paz and Rio de Janeiro), 15h. (De Bilt), 17h. (Belgrade), 19h. (La Paz, Victoria, Toronto, Ottawa, Strasbourg, Rio Tinto, De Bilt, and Eskdalemuir), 20h. (Ekaterinburg).

May 9d. 18h. 33m. 6s. Epicentre 35°·0N. 22°·5E. (as on May 6d. 22h.).

	Δ	Az.	P.	O−C.	L.	M.
	°	°	m. s.	s.	m.	m.
Athens	3·1	18	e 0 51	+ 2	i 1·2	1·5
Pompeii	8·5	315	e 2 6	− 3	—	—
Rocca di Papa	10·2	314	e 2 36	+ 3	5·1	5·3
Zagreb	11·9	337	—	—	e 3·9	—
Strasbourg	17·4	326	—	—	e 7·9	—
De Bilt E.	21·1	329	—	—	e 10·8	—
Edinburgh	27·2	328	—	—	e 12·9	—

Additional readings : Athens gives also MN = +1·6m. Rocca di Papa +3m.54s. and +4m.54s. De Bilt eN = +10m.36s.

May 9d. Readings also at 3h. (La Paz), 5h. (Nagasaki), 10h. (near Athens), 11h. (Toledo and Nagasaki (3)), 12h. (Coimbra, Zagreb, and Rocca di Papa), 13h. (Zi-ka-wei and Nagasaki), 14h. (near Kobe), 15h. (Toledo), 16h. (Coimbra).

May 10d. 3h. 44m. 48s. Epicentre 55°·2S. 23°·0W.

$A = +\cdot525$, $B = -\cdot223$, $C = -\cdot821$; $D = -\cdot391$, $E = -\cdot921$; $G = -\cdot756$, $H = +\cdot321$, $K = -\cdot571$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Cipolletti		34·0	280	12 54	?S	(12 54)	+14	21·5	26·8
Rio de Janeiro	E.	35·6	325	i 8 37	?PR_1	13 4	0	16·2	—
	N.	35	325	e 8 37	?PR_1	13 5	+ 1	16·1	17·6
Cape Town		35·6	71	13 2	?S	(13 2)	− 3	—	—
Pilar	E.	37·0	291	13 6	?S	(13 6)	−18	30·7	32·9
Mendoza		38·4	285	16 30	?SR_1	—	—	28·0	32·4
La Paz		51·7	300	i 9 18	0	i 16 40	0	24·8	29·0
Riverview		90·8	175	—	—	—	—	e 52·6	61·3
San Fernando	E.	92·8	13	—	—	—	—	—	61·2
Algiers		94·7	21	—	—	—	—	e 50·2	53·2
Coimbra		96·2	11	12 32	−78	e 27 20	+122	50·7	—
Toledo		96·5	15	—	—	—	—	e 84·2	—
Colombo		103·0	95	47 12	?L	—	—	(47·2)	—
Moncalieri		103·5	22	e 17 38	?PR_1	30 2	?SR_1	53·2	—
Strasbourg		106·9	21	—	—	—	—	e 58·2	—
Uccle		108·4	19	—	—	e 27 0	−14	e 53·2	—
De Bilt		109·8	20	e 19 19	?PR_1	e 27 14	−12	e 53·2	61·0
Toronto		109·8	320	e 16 12	+76	25 12	[+ 3]	60·8	—
Bidston		109·9	13	35 12	?SR_1	—	—	—	—
Ottawa		110·0	323	e 16 44	+107	—	—	e 62·2	—
Chicago		111·4	313	e 19 17	?PR_1	—	—	56·2	—
Eskdalemuir	E.	111·8	12	—	—	e 27 26	−18	e 35·5	—
Edinburgh		112·3	12	—	—	—	—	e 63·2	—
Tiflis	N.	112·7	48	—	—	—	—	e 64·4	75·7
Victoria		133·0	296	22 37	?PR_1	—	—	69·8	—
Zi-ka-wei		145·3	120	—	—	—	—	—	21·4

Additional readings and notes: Riverview gives also MN = +58·7m. San Fernando MN = +57·2m. Eskdalemuir eN = +29m.16s. De Bilt eN = +25m.20s., e = +28m.54s., MZ = +66·7m., MN = +67·2m. Ottawa e = +25m.12s., +26m.53s., +28m.44s., and +34m.38s. Tiflis eLE = +68·3m., ME = +74·4m. Ekaterinburg ($\Delta = 130°\cdot8$) gives e_1 = 4h., $e_2 = e_1 + 3$m.24s., $L = e_1 + 40$m. Zi-ka-wei P = 3h.6m.30s.

May 10d. Readings also at 0h. (Manila), 7h. (Athens and La Paz), 9h. (Strasbourg and Nagasaki), 10h. (Zagreb), 13h. (Hakodate and near Mizusawa), 16h. (La Paz), 17h. (Almeria), 20h. (La Paz).

May 11d. 8h. 24m. 12s. Epicentre 14°·0S. 116°·5E. (as on 1922 April 11d.).

$A = -\cdot943$, $B = +\cdot227$, $C = -\cdot242$; $D = +\cdot233$, $E = +\cdot972$; $G = +\cdot235$, $H = -\cdot056$, $K = -\cdot970$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	24·2	212	e 5 32	+ 2	e 9 51	+ 3	—	11·6
Manila	53·3	300	8 25	−63	—	—	—	—
Batavia	59·0	271	e 9 45	−20	i 18 2	− 9	—	—
Victoria	87·9	39	23 17	?S	(23 17)	[+ 3]	40·4	44·4
Ekaterinburg	110·3	326	17 0	+121	23 9	?	35·8	—
Toronto	117·0	46	e 20 18	?PR_1	—	—	43·8	—
Ottawa	119·3	44	e 19 48	?PR_1	e 25 25	[−18]	55·8	—
De Bilt	139·1	342	—	—	—	— e	70·8	—

Additional readings: Riverview gives also PR_1 = +6m.4s., MN = +10·8m., T_o = 8h.14m.9s. (?24m.). Ottawa e? = +18m.40s.

May 11d. 8h. 42m. 40s. Epicentre 41°·5N. 7°·0W. (as on 1920 Nov. 26d.).

A = +·743, B = −·091, C = +·663 ; D = −·122, E = −·992 ; G = +·658, H = −·081, K = −·749.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Toledo		2·8	126	0 50	+ 6	1 31	+14	(1·5)	—
Granada		5·1	148	i 1 3	−16	i 1 21	−61	1·5	1·7
San Fernando	E.	5·1	173	1 29	+10	—	—	—	1·8
Malaga		5·2	157	1 0	−20	—	—	—	—

No other readings.

May 11d. Readings also at 1h. (Rio de Janeiro and Strasbourg), 2h. (Edinburgh and near Manila (2)), 3h. (Colombo), 5h. (Riverview), 12h. (Nagasaki), 18h. (near Manila), 21h. (Algiers, La Paz, and Nagasaki).

May 12d. 1h. 19m. 50s. Epicentre 8°·0S. 105°·0E. (as on 1919 July 29d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia		2·6	45	i 2 2	+81	i 2 23	+71	—	—
Malabar		2·7	73	i 0 58	+16	i 1 4	−10	—	—
Manila		27·6	35	e 5 55	− 9	—	—	12·3	13·1
Colombo		29·2	299	6 10	−10	11 28	+ 8	15·6	19·9
Hong Kong		31·6	16	6 27	−16	12 44	+43	18·4	19·2
Kodaikanal		32·9	303	10 10	?S	(10 10)	−132	16·8	21·6
Calcutta	E.	34·6	332	6 9	−61	13 9	+20	21·2	—
Bombay		41·6	311	8 2	− 6	14 15	−14	22·1	—
Zi-ka-wei		42·2	22	i 8 2	−10	e 13 4	−94	—	23·3
Melbourne		46·7	138	—	—	14 58	−39	22·6	30·9
Simla	N.	47·3	327	8 52	+ 3	15 28	−17	23·9	27·6
Riverview		49·7	128	e 9 0	− 5	i 16 23	+ 8	e 23·0	30·0
Sydney		49·7	128	—	—	16 16	+ 1	28·5	35·4
Wellington		69·6	132	—	—	i 20 40	+19	e 37·4	40·2
Tiflis	E.	74·0	319	e 12 7	+25	21 34	+20	41·2	49·4
Ekaterinburg		74·2	337	i 10 47	−56	i 20 7	−69	32·2	44·1
Helwan		80·1	302	12 23	+ 3	22 38	+14	—	47·7
Athens		88·1	310	e 12 58	− 8	i 23 40	[+24]	—	—
Belgrade		91·8	315	e 13 14	−12	e 24 19	−14	e 32·6	40·0
Zagreb		95·0	315	e 13 10?	−33	e 24 10?	[+13]	36·2?	—
Vienna		95·0	320	i 13 38	− 5	e 24 7	[+10]	e 52·2	60·7
Upsala		95·6	330	—	—	e 24 10	[+10]	e 47·2	65·6
Rocca di Papa		97·0	312	e 13 46	− 8	25 10	−16	54·7	56·2
Hamburg		99·4	323	e 17 28	?	—	—	e 50·2	61·2
Honolulu	E.	99·4	70	—	—	—	—	e 49·8	53·3
Moncalieri		100·8	315	e 17 26	?	e 24 30	[+ 2]	51·0	65·2
De Bilt		102·3	322	e 14 11	−11	e 24 46	[+11]	e 46·2	65·8
Uccle		102·9	320	e 18 10	?PR_1	e 24 47	[+ 9]	e 47·2	—
Paris		104·2	319	—	—	—	—	63·2	—
Tortosa	E.	106·1	311	18 34	?PR_1	—	—	e 59·2	62·4
	N.	106·1	311	—	—	—	—	e 49·2	63·1
Eskdalemuir		106·9	326	—	—	e 25 10	[+13]	48·2	62·0
Stonyhurst		106·9	323	e 25 22	?S	(e 25 22)	[+25]	—	76·2
Bidston		107·2	323	27 10	?S	(27 10)	+ 7	—	62·7
Toledo		109·7	310	e 19 14	?PR_1	e 28 36	+71	e 46·6	—
Coimbra		114·4	311	e 19 30	?PR_1	29 33	+88	e 50·2	75·4
Victoria	E.	122·8	35	31 0	?	42 20	?SR_1	58·3	79·8
	N.	122·8	35	—	—	41 38	?SR_1	58·7	83·7
Ottawa		142·6	0	e 21 40	?PR_1	—	—	e 62·2	—
Toronto		144·2	6	i 19 48	[+ 1]	33 3	?	74·9	86·4
Chicago		144·4	14	19 51	[+ 4]	29 26	?	e 52·7	—
Georgetown		149·0	2	19 54	[0]	30 4	?	—	—
Washington		149·0	2	22 1	?PR_1	—	—	—	—
La Paz		154·6	195	20 18	[+16]	34 45	?	77·2	80·4

For Notes see next page.

NOTES TO MAY 12d. 1h. 19m. 50s.

Additional readings: Manila gives also MN = +12·6m. Melbourne SR_1 = +18m.34s. Riverview PS = +16m.44s., MN = +26·8m., MZ = +29·8m. T_0 = 1h.19m.50s. Wellington eS = +20m.35s., e = +25m.28s., +29m.40s., +34m.16s., and +35m.40s. Tiflis PN = +14m.10s., SN = +23m.40s., MN = +55·5m. Ekaterinburg i = +10m.49s., PR_1 = +13m.28s., iPS = +20m.44s., iSR_1 = +25m.37s., MN = +42·0m. Athens eS = +23m.25s. Zagreb ePR_1 = +17m.10s.? Vienna PR_1 = +17m.25s., e = +27m.12s. Upsala MN = +60·0m. Rocca di Papa e = +14m.22s., eP = +17m.34s. Moncalieri MN = +62·3m. De Bilt MN = +58·9m., MZ = +65·5m. Stonyhurst readings have been diminished by 1h. Bidston S = +33m.30s. (?SR_1). Coimbra eSN = +32m.10s. Ottawa e = +23m.26s., +35m.10s., and +48m.10s. Toronto i = +22m.52s. and +23m.29s., e = +31m.32s., eL = +42·5m. Chicago PR_1 = +23m.2s.

May 12d. 22h. 57m. 23s. Epicentre 40°·5N. 45°·0E.

A = +·538, B = +·538, C = +·649; D = +·707, E = −·707; G = +·459, H = +·459, K = −·760.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis	1·2	353	i 0 19	+ 1	i 0 32	− 1	—	—
Ekaterinburg	19·3	26	i 4 33	0	i 8 8	0	9·6	12·9
Vienna	21·7	300	i 4 54	− 7	—	—	—	44·6
Rocca di Papa	24·2	284	e 4 50	−40	—	—	—	4·9
Innsbruck	25·0	297	e 5 37	− 1	—	—	—	—
Upsala	25·8	328	e 10 10	?S	(e 10 10)	− 8	e 13·6	—
Hamburg	26·9	311	e 5 48	− 9	—	—	e 13·6	15·6
Moncalieri	27·5	292	—	—	e 11 5	+15	16·8	—
Strasbourg	27·5	300	—	—	—	—	e 9·6	—
De Bilt	29·4	307	—	—	e 11 33	+ 9	e 14·6	18·4
Uccle	29·8	304	—	—	—	—	e 14·6	—
Bidston	34·5	308	—	—	—	—	—	12·6
Eskdalemuir	34·7	312	—	—	(10 37)	−134	10·6	—

Additional readings and notes: Tiflis gives also i = +4m.53s., iN = +5m.19s. Ekaterinburg iSR_1 = +8m.31s., iSR_2 = +8m.45s. All readings are given as on 13d. Rocca di Papa ePN = +4m.52.

May 12d. Readings also at 0h. (Denver), 2h. (Batavia), 4h. (Rio Tinto and near Malabar), 10h. (near Batavia), 15h. (Manila), 17h. (Apia and La Paz), 19h. (Manila), 22h. (Zi-ka-wei).

May 13d. Readings at 2h. (Granada), 3h. (Tiflis), 5h. (near Osaka and Kobe), 7h. (Apia), 13h. (Zagreb), 14h. (Pompeii, Rocca di Papa, Coimbra, Florence, and Vienna), 15h. (Apia and Ekaterinburg), 18h. (Ekaterinburg).

May 14d. 7h. 2m. 32s. Epicentre 16°·0N. 153°·5E.

A = −·860, B = +·429, C = +·276; D = +·446, E = +·895; G = −·247, H = +·123, K = −·961.

Very rough.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Osaka	24·7	322	5 37	+ 2	—	—	12·7	17·5
Manila	31·4	272	—	—	e 11 59	+ 1	—	—
Zi-ka-wei	32·9	303	e 6 54	− 2	—	—	—	10·4
Ekaterinburg	78·0	326	e 15 45	?PR_1	e 23 46	+106	32·5	36·8

No additional readings.

May 14d. Readings also at 10h. (near Athens), 11h. (Riverview, Zi-ka-wei, and Ekaterinburg), 17h. (Batavia), 18h. (Zi-ka-wei), 19h. and 20h. (Lick), 22h. (Algiers and Lick).

May 15d. 4h. 11m. 10s. Epicentre 8°·0S. 105°·0E. (as on May 12d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	2·6	45	e 1 6	+25	1 57	+45	—	—
Malabar	2·7	73	i 0 50	+ 8	i 1 9	− 5	—	—
Manila	27·6	35	e 6 13	+ 9	11 21	+29	11·3	—
Colombo	29·2	299	15 50	?L	—	—	(15·8)	24·8
Hong Kong	31·6	16	11 14	?S	(11 14)	+47	—	—
Zi-ka-wei	42·2	22	e 8 3	− 9	—	—	—	30·6
Ekaterinburg	74·2	337	12 26	+43	21 29	+13	30·8	43·5
De Bilt	102·3	322	—	—	—	—	e 59·8	—
Eskdalemuir	106·9	326	—	—	—	—	60·8	—

Additional readings: Batavia gives also i = +1m.21s. Malabar iSN = +1m.6s. De Bilt eLN = +58·8m.

May 15d. 21h. 29m. 2s. Epicentre 15°·0S. 172°·0W. (as on 1921 July 29d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	1·2	11	e 0 16	− 2	—	—	—	5·0
Riverview	38·1	233	—	—	—	—	e 21·1	25·7
Honolulu	38·8	23	—	—	—	—	e 19·0	—
Manila	72·5	291	e 11 40	+ 7	—	—	—	—
Victoria E.	76·7	31	12 4	+ 5	—	—	40·2	43·6
N.	76·7	31	12 3	+ 4	—	—	40·3	43·7
Zi-ka-wei	78·8	307	12 12	0	—	—	—	48·2
La Paz	98·6	109	e 20 31	?PR$_1$	e 31 18	?SR$_1$	50·1	52·4
Toronto	102·2	48	24 50	?S	(24 50)	−87	50·0	—
Ottawa	105·0	45	24 58	?S	(24 58)	−104	51·0	—
Ekaterinburg	122·5	329	14 43	−72	—	—	—	—
Edinburgh	138·3	10	—	—	—	—	e 78·0	—
Eskdalemuir	138·8	10	e 23 58	?PR$_1$	e 41 28	?SR$_1$	76·0	—
De Bilt	142·9	3	e 20 12	[+27]	—	—	e 81·0	—
Vienna	146·1	350	e 19 49	[− 1]	—	—	—	81·5
Strasbourg	146·5	0	e 20 58	[+ 7]	—	—	—	—
Rocca di Papa	153·0	352	e 18 28	[−92]	—	—	—	81·3

Additional readings and notes: Riverview gives also e = +17m.22s., MN = +25·4m. Victoria, PE and PN have both been diminished by 10m. Toronto S? = +34m.29s., L = +62·6m. Ottawa S = +33m.58s., eL = +40·5m. De Bilt eLN = +79·0m. Rocca di Papa. It seems possible that this is a simple P—carrying on the tables gives the residual +25s. The residual for [P] is −92s., which is out of the question.

May 15d. Readings also at 1h. (near Manila), 2h. (Kodaikanal and near La Paz), 3h. and 4h. (Algiers), 7h. (Rocca di Papa), 8h. (Rio Tinto), 9h. (near Batavia and Malabar), 15h. (Nagasaki and near Mizusawa), 17h., 18h., and 20h. (Nagasaki).

May 16d. 18h. 4m. 13s. Epicentre 27°·0S. 176°·0W.

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.
Wellington	16·2	206	—	—	e 6 35	−25	i 9·0	9·8
Riverview	29·0	248	—	—	e 11 17	0	e 14·0	e 14·7
Sydney	29·0	248	6 35	+17	—	—	12·5	15·6
Adelaide	39·4	247	—	—	—	—	e 20·3	22·6
Zi-ka-wei	83·3	310	12 38	0	—	—	—	44·0
Colombo	105·7	270	57 47	?L	—	—	(57·8)	66·8
Kodaikanal	109·3	272	64 47	?L	—	—	(64·8)	—
Ottawa	115·8	50	—	—	—	—	e 60·3	—
Ekaterinburg	130·4	323	i 19 18	[− 1]	—	—	55·8	—
De Bilt	154·9	358	e 20 0	[− 2]	—	—	e 82·8	—

Additional readings and notes: Wellington gives also i = +11m.23s. Riverview MN = +15·6m. Sydney P has been increased by 10m. Adelaide gives several other e readings. Ottawa e = +23m.15s., +29m.47s., and +35m.23s., L = +66·8m. Ekaterinburg i = +19m.31s., +22m.45s., and +22m.58s.

May 16d. Readings also at 2h. (Zurich and Vienna), 6h. (La Paz), 8h. (Zi-ka-wei), 10h. (near Zurich), 15h. (De Bilt), 16h. (La Paz and Zi-ka-wei), 20h. (Zi-ka-wei and Manila), 21h. (Ekaterinburg, Strasbourg, and De Bilt).

May 17d. 10h. 36m. 54s. Epicentre 35°·0N. 5°·0W.

A = +·816, B = −·071, C = +·574 ; D = −·087, E = −·996 ; G = +·571, H = −·050, K = −·819.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
San Fernando		1·7	326	0 30	+ 4	—	—	1·1	—
Malaga		1·8	15	0 39	+11	—	—	—	—
Granada		2·4	27	i 0 34	− 3	i 0 50	−16	0·9	1·4
Almeria		2·8	48	0 37	− 7	—	—	—	—
Toledo		4·9	9	e 1 14	− 2	e 2 14	0	e 2·7	2·8
Algiers		6·8	72	e 3 10	?S	(e 3 10)	+ 5	4·3	4·4
Tortosa	E.	7·2	35	1 41	− 8	—	—	3·6	4·2
	N.	7·2	35	1 43	− 6	—	—	3·4	4·1
Strasbourg		16·5	31	—	—	—	—	e 10·1	—
Uccle		17·2	20	—	—	—	—	e 8·8	—
De Bilt		18·5	20	—	—	—	—	e 9·9	—

Additional readings: Granada gives also MN = +1·3m. Tortosa PZ is entered in the E line.

May 17d. Readings also at 2h. (Manila), 6h. (Florence), 12h. (Ekaterinburg) 15h. (Manila, Zi-ka-wei, Taihoku, and Ekaterinburg), 17h. (near Belgrade), 21h. (Taihoku), 23h. (La Paz).

May 18d. Readings at 0h. and 3h. (Algiers), 7h. (Apia, near Batavia and Malabar, and near Zi-ka-wei and Nagasaki), 11h. (Sinj, Zi-ka-wei, Taihoku, and Denver), 12h. (Nagasaki), 13h. (Moncalieri).

May 19d. Readings at 0h. (Zi-ka-wei), 2h. and 5h. (Ekaterinburg), 9h. (Nagoya), 16h. (Manila and near Mizusawa), 18h. (Ekaterinburg), 21h. (Taihoku), 23h. (Ekaterinburg, Apia, Batavia, Zi-ka-wei, and Manila).

May 20d. 20h. 51m. 45s. Epicentre 39°·3N. 21°·0E. (as on 1921 June 26d.).

A = +·722, B = +·277, C = +·633 ; D = +·358, E = −·934 ; G = +·591, H = +·227, K = −·774.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		2·6	120	e 0 41	0	(1 11)	− 1	1·2	1·9
Sarajevo		4·9	339	e 1 17	+ 1	i 2 24	+10	(i 2·4)	3·4
Pompeii	E.	5·2	288	i 1 15	− 5	2 37	+15	(2·6)	3·2
Belgrade		5·5	356	e 1 22	− 3	—	—	(3·5)	5·7
Rocca di Papa	E.	6·8	294	i 1 33	−11	3 27	+22	(3·7)	4·6
	N.	6·8	294	i 1 39	− 5	2 48	−17	(3·9)	4·6
Zagreb		7·5	332	e 1 54	0	i 3 44	+20	i 4·0	5·0
Florence		8·5	305	3 43	?S	(3 43)	− 7	(4·8)	5·2
Vienna		9·4	341	e 2 45	+23	—	—	i 5·6	7·6
Innsbruck	N.W.	10·6	322	e 2 27	−11	i 4 57	+12	—	—
Moncalieri		11·3	305	e 3 28	+39	5 42	+40	6·7	8·9
Zurich		12·1	316	e 2 54	− 6	5 39	+18	—	—
Strasbourg		13·3	319	e 6 6	?S	(e 6 6)	+15	e 8·2	—
Hamburg		16·1	336	3 45	− 8	—	—	e 9·2	—
Uccle		16·4	320	e 3 57	0	e 7 3	− 1	e 8·8	—
De Bilt		16·8	325	4 6	+ 4	7 20	+ 7	e 9·0	11·8
Toledo		19·2	280	e 4 5	−26	e 7 35	−31	9·2	—
Oxford		19·8	316	—	—	i 8 22	+ 3	10·6	13·2
Upsala	E.	20·7	355	—	—	—	—	e 12·6	—
Coimbra		22·5	281	4 7	−64	8 35	−40	13·8	—
Edinburgh		23·0	324	—	—	—	—	e 19·2	—
Ekaterinburg		31·1	43	6 23	−16	e 11 27	−26	15·2	17·9

Additional readings: Athens gives also iP = +0m.45s., MN = +2·2m. Sarajevo iP = +1m.44s. Belgrade L is given as $SR_{||}$, also iP = +2m.18s. Rocca di Papa L readings are given as S. Zagreb eNW = +2m.30s., eNE = +2m.34s. and +3m.8s., eNW = +3m.10s., MNW = +5·7m. Vienna i = +6m.45s. Innsbruck readings are given as eS and iS. Moncalieri MN = +7·5m. De Bilt MN = +17·2m., MZ = +12·3m. Coimbra eLN = +14·4m., T_o = 20h.50m.32s.

May 20d. Readings also at 0h. (Apia), 3h. (Manila), 7h. (Nagasaki (3)), 10h. (Taihoku), 12h. (Nagasaki and near Rocca di Papa), 13h. (near Batavia and Malabar), 14h. and 18h. (Nagasaki), 20h. (Victoria and Ekaterinburg), 22h. and 23h. (Ekaterinburg).

May 21d. 22h. 58m. 36s. Epicentre 39°·3N. 21°·0E. (as on May 20d.).

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	2·6	120	e 0 43	+ 2	(e 1 7)	− 5	e 1·1	1·3
Pompeii	5·2	288	2 19	?S	(2 19)	− 3	—	—
Rocca di Papa	6·8	294	e 2 0	+16	(i 2 57)	− 8	3·4	4·1
Zagreb	7·5	332	—	—	e 3 1	−23	e 3·7	—
Moncalieri	11·3	305	e 2 17	−32	6 4	+62	—	—
Uccle	16·4	320	—	—	—	—	e 9·4	—
Ekaterinburg	31·1	43	—	—	e 13 16	+83	16·4	—

Additional readings: Athens gives also MN = +1·2m. Rocca di Papa S is given as iP, LN = +3·6m.

May 21d. Readings also at 6h. (near Athens (2)), 10h. (Manila), 11h. (near Taihoku), 12h. (Athens, Rocca di Papa, and near Taihoku), 13h. (near Sapporo, Mizusawa, and Hakodate), 15h. (Nagasaki (2)), 20h. (Tortosa), 21h. (Manila).

May 22d. 10h. 9m. 40s. Epicentre 45°·0N. 16°·0E. (as on 1921 Jan. 1d.).

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

Very doubtful.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Zagreb	0·8	359	i 0 27	+15	i 0 55	+33	—	1·5
Sarajevo	2·1	123	e 0 27	− 6	i 0 51	− 7	—	1·0
Belgrade	3·2	93	e 1 4	+14	e 1 52	+24	—	—
Vienna	3·3	4	1 1	+ 9	i 1 55	+24	—	2·6
Innsbruck	3·9	305	e 1 14	−13	—	—	—	—
Rocca di Papa E.	4·0	218	0 39	−23	1 33	−17	—	1·8
Pompeii	4·3	195	e 2 30	?L	—	—	(e 2·5)	—
Zurich	5·6	298	e 1 26	− 1	2 48	+14	—	—

Additional readings: Zagreb gives also iPR_1 = +0m.31s., iE = +59s., iSR_1 = +1m.5s., MNW = +1·2m. Rocca di Papa ePE = +50s.

May 22d. Readings also at 3h. and 5h. (Ekaterinburg), 10h. (near Taihoku), 11h. (near Mizusawa), 12h. (La Paz, Coimbra, and near Mizusawa), 13h. (Uccle, De Bilt, Edinburgh, and Eskdalemuir), 19h. (Rio Tinto), 22h. (Simla).

1923. May 23d. 22h. 37m. 0s. Epicentre 53°·2N. 162°·6E.

A = −·572, B = +·179, C = +·801 ; D = +·299, E = +·954 ;
G = −·764, H = +·239, K = −·599.

The La Paz residual [+31] suggests an error in T_0 or a high focus. On re-examining the residuals for possible correction to T_0 a small negative correction is indicated, say −8s., which would increase the La Paz residual to [+39s.]. There seems, however, no other reason to assume an abnormal focal depth.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	14·3	251	3 25	− 5	(6 22)	+ 7	6·4	—
Sapporo	17·3	243	4 33	+24	7 0	−25	11·1	—
Hakodate	18·6	241	4 50	+26	—	—	—	—
Mizusawa E.	20·4	235	4 47	+ 1	8 42	+10	12·7	—
Nagoya	25·5	235	5 29	−14	—	—	13·1	—
Osaka	26·6	237	6 18	+24	11 8	+35	14·6	18·0
Kobe	26·8	237	5 30	−26	—	—	14·8	18·1
Nagasaki	31·1	242	6 21	−18	—	—	—	—
Sitka	34·4	58	—	—	e 12 34	−12	19·0	20·7
Zi-ka-wei	36·9	250	e 7 11	−18	e 12 51	−31	—	23·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		41·6	244	—	—	e 14 15	−14	—	—
Honolulu	N.	43·7	122	8 29	+ 5	14 51	− 7	20·6	24·4
Victoria	E.	44·9	66	8 18	−14	15 3	−11	23·6	26·0
	N.	44·9	66	8 25	− 7	15 2	−12	23·5	27·6
Hong Kong		47·8	249	8 43	−10	15 55	+ 4	23·9	29·7
Manila		50·6	237	e 9 14	+ 3	—	—	26·4	27·5
Berkeley		52·2	77	9 54	+33	16 8	−38	e 22·1	24·9
Ekaterinburg		53·0	320	i 9 20	− 6	i 16 53	− 3	25·0	35·4
Calcutta		62·8	273	10 50	+19	—	—	—	—
Simla	N.	63·0	287	19 30	?S	(19 30)	+29	40·1	42·0
Upsala	N.	63·6	343	e 10 34	− 2	e 19 13	+ 5	e 35·0	e 37·9
Bergen		65·0	349	—	—	19 0	−25	44·0	—
Chicago		67·5	50	10 3	−58	19 55	− 1	33·5	—
Ann Arbor		68·8	47	—	—	e 20 18	+ 6	35·0	—
Dyce		68·9	352	i 11 28	+18	20 33	+20	26·6	43·1
Toronto	E.	69·5	43	11 28	+14	20 21	+ 1	36·3	37·8
	N.	69·5	43	11 33	+19	20 22	+ 2	28·0	37·9
Ottawa		69·6	40	11 20	+ 5	20 19	− 2	28·4	43·5
Edinburgh		70·3	352	e 14 0	?PR_1	20 28	− 2	31·0	61·7
Apia		70·6	153	—	—	—	—	e 36·0	—
Eskdalemuir		70·9	352	e 11 20	− 2	e 20 46	+ 9	36·0	52·2
Hamburg		70·9	345	i 11 24	+ 2	e 20 50	+13	e 36·5	47·2
Tiflis		71·2	317	e 11 36	+12	21 6	+26	e 38·0	50·5
Lemberg		71·2	334	e 10 54	−30	—	—	e 39·3	48·9
Northfield		71·8	38	—	—	—	—	e 34·0	—
Ithaca		71·8	42	—	—	—	—	37·0	—
Stonyhurst		72·2	351	e 12 0	+29	21 0	+ 8	—	42·0
Bidston		72·8	351	11 24	−11	21 20	+20	—	66·0
De Bilt		73·0	346	11 37	+ 1	21 8	+ 6	e 34·0	43·6
Oxford		74·2	351	i 11 44	+ 1	21 18	+ 2	—	52·0
Uccle		74·4	347	e 11 44	− 1	e 21 20	+ 1	e 32·0	44·2
Georgetown		74·5	45	e 11 47	+ 1	20 4	−76	37·3	—
Washington		74·5	45	11 45	− 1	21 23	+ 3	e 37·0	—
Vienna		74·6	339	11 43	− 3	21 27	+ 6	e 43·0	53·0
Bombay		74·8	282	e 12 25	+37	21 20	− 4	42·2	—
Batavia		75·6	240	i 11 46	− 7	i 21 29	− 4	44·6	—
Strasbourg		76·1	345	11 53	− 3	21 54	+16	e 36·0	52·8
Paris		76·6	348	—	—	—	—	41·0	—
Innsbruck		76·6	341	e 11 59	0	—	—	e 37·0	48·4
Belgrade		76·8	334	e 11 40	−20	e 21 37	−10	e 44·2	52·5
Zagreb		77·0	338	12 0?	− 1	e 21 55	+ 6	e 40·0	59·1
Zurich		77·1	342	11 59	− 3	21 38	−12	e 47·0	—
Besançon		77·7	345	—	—	—	—	43·0	—
Kodaikanal		79·0	274	33 30	?	—	—	48·9	59·1
Moncalieri		79·5	344	12 9	− 7	22 26	+ 8	32·8	51·3
Florence		79·9	340	—	—	e 18 51	?	—	55·1
Colombo		80·2	270	15 12	?PR_1	29 6	?SR_1	46·6	52·5
Rocca di Papa		81·6	339	e 12 22	− 6	22 58	+16	e 44·2	56·6
Pompeii		82·1	337	12 37	+ 6	—	—	—	—
Athens	N.	82·2	329	e 11 11	−80	22 40	− 8	e 45·0	54·0
Barcelona		83·9	346	12 35	− 6	—	—	e 30·2	50·1
Tortosa		84·8	348	12 44	− 3	i 23 9	− 8	—	54·4
Toledo		86·3	350	12 49	− 6	23 25	− 8	e 37·6	57·5
Coimbra	E.	86·4	353	e 12 46	− 9	23 24	−10	37·0	58·6
	N.	86·4	353	—	—	23 16	−18	e 35·0	58·6
Riverview		87·7	190	—	—	24 12	+23	e 42·2	58·6
Lisbon		87·8	354	e 9 35	?	—	—	e 47·6	—
Algiers		88·3	345	e 10 23	−164	20 6	−229	36·0	62·5
Rio Tinto		88·6	352	19 0	?PR_1	—	—	—	65·0
Granada		88·8	350	13 10	+ 1	23 55	− 6	e 48·0	55·4
San Fernando	E.	89·9	352	—	—	24 9	− 4	50·5	66·0
	N.	89·9	352	12 59	−16	24 9	− 4	51·0	65·0
Adelaide		90·6	200	—	—	e 24 0	−20	e 54·0	62·3
La Paz		126·2	68	e 19 40	[+31]	34 0	?	70·0	83·7
Mendoza		138·7	81	30 18	?	—	—	—	126·7
Cipolletti		142·9	87	66 42	?L	—	—	77·8	94·8

Additional readings and notes: Mizusawa gives also SN = +8m.44s. Osaka MN = +19·6m. Kobe MN = +23·0m. Nagasaki reading has been diminished by 1h. Sitka LN = +19·1m. Zi-ka-wei MN = +24·8m. Honolulu LN = +19·6m. and +23·0m., T_o = 22h.37m.26s. Manila MN = +27·7m. Berkeley PZ = +9m.58s. and +10m.1s., PR_2Z = +13m.19s., +13m.20s., and +13m.21s., SN = +16m.14s., SE = +16m.18s., and +16m.28s., SR_2E = +19m.34s. Ekaterinburg MZ = +36·5m., MN = +37·2m. Upsala eLE = +33·5m., ME = +42·7m. Bergen i = +35m.0s. Toronto eE = +20m.32s., eLE = +28·1m., eLN = +27·0m.

Continued on next page.

Hamburg MZ = +50·0m., MN = +62·0m. Tiflis eN = +11m.42s., MN = +54·6m. Northfield L = +42·0m. Stonyhurst readings are given as on 24d. De Bilt MN = +48·2m., MZ = +52·8m. Georgetown eLE = +30·5m., LN = +37·5m. Washington L = +38·5m. Vienna iZ = +12m.12s. and +13m.16s. Batavia i = +16m.46s. and +25m.33s. Strasbourg MN = +57·4m. Belgrade PR_1 = +13m.35s. and +15m.17s. Zagreb MNW = +44·9m. Moncalieri MN = +55·5m. Florence eS = +18m.56s. Rocca di Papa iN = +12m.27s., iE = +12m.32s., SE = +23m.0s., eLN = +46·2m. Athens ME = +54·8m. Tortosa MN = +53·8m. Toledo MN = +56·7m. Riverview ePR_1? = +18m.42s., MN = +58·8m. Granada iP = +13m.15s., PR_1 = +16m.16s., PR_2 = +17m.15s. PS = +25m.13s., MN = +59·3m. Adelaide e = +37m.6s., eSR_1? = +42m.0s., eSR_2 = +45m.36s., e = +48m.12s., and +49m.12s. La Paz PR_1 = +24m.15s.

May 23d. Readings also at 0h. (La Paz, Capetown, and Nagasaki), 5h. (La Paz), 9h. (Nagasaki), 10h. (La Paz), 11h. (Taihoku and Hokoto), 12h. (Zurich, Florence, Zagreb, and Rocca di Papa), 15h. (La Paz and Nagasaki), 20h. (Manila and near Mizusawa), 22h. (Batavia and Malabar), 23h (Malabar).

May 24d. Readings at 4h. (Nagasaki), 5h. (Rocca di Papa), 6h. and 8h. (near Athens), 10h. (La Paz, Nagoya, and near Mizusawa), 11h. (La Paz), 14h. (Coimbra), 17h. (Nagasaki), 20h. (Colombo), 21h. (Manila).

May 25d. 22h. 21m. 25s. Epicentre 32°·0N. 57°·0E.

A = +·462, B = +·711, C = +·530; D = +·839, E = −·545; G = +·289, H = +·444, K = −·848.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis	E.	13·7	318	e 3 34	+12	e 6 56	+55	9·1	11·6
Simla	E.	17·2	87	4 17	+10	—	—	10·2	10·8
	N.	17·2	87	4 35	+28	e 7 29	+ 7	9·7	—
Bombay		19·4	129	5 9	+35	9 2	+52	12·8	—
Helwan		22·1	271	5 37	+31	10 5	+58	—	16·7
Athens		27·7	292	e 5 48	−17	e 11 30	+36	e 18·6	20·8
Kodaikanal		28·8	134	—	—	—	—	14·5	25·2
Calcutta		29·3	101	5 46	−35	11 15	− 7	16·4	—
Colombo		32·9	136	—	—	—	—	—	21·6
Zagreb		34·3	308	e 7 8	+ 1	—	—	e 27·3	—
Vienna		34·5	313	i 7 7	− 2	17 47	?L	(17·8)	—
Pompeii		34·9	300	8 25	+73	—	—	—	—
Rocca di Papa		36·3	301	7 29	+ 5	15 29	+135	27·9	31·0
Innsbruck	N.E.	37·6	310	e 7 36	+ 1	—	—	—	—
Upsala		38·0	330	e 9 5	?PR_1	—	—	e 22·6	26·8
Zurich		39·5	308	e 7 50	− 1	e 13 59	0	e 27·6	—
Hamburg		39·7	319	e 9 16	+84	—	—	e 21·6	30·6
Moncalieri		40·0	304	e 8 14	+19	17 15	+188	27·2	—
Strasbourg		40·2	310	(e 8 35)	+38	e 8 35	?P	e 28·6	—
De Bilt		42·3	315	8 2	−11	—	—	e 27·6	29·6
Uccle		42·6	313	e 8 13	− 2	e 14 35	− 8	e 24·6	—
Paris		43·7	310	—	—	e 18 35	+217	29·6	30·6
Algiers		44·2	293	—	—	—	—	e 23·6	37·6
Stonyhurst		47·0	315	e 19 5	?SR_1	—	—	—	32·1
Bidston		47·3	315	19 35	?SR_1	26 1	?L	(26·0)	34·9
Eskdalemuir		47·5	319	—	—	—	—	28·6	32·6
Edinburgh		47·5	319	—	—	—	—	e 28·6	—
Toledo		49·1	299	—	—	e 16 35	+28	—	—
Hong Kong		51·2	86	9 15	+ 1	16 35	+ 1	—	32·1
Rio Tinto		51·5	296	29 35	?L	—	—	(29·6)	39·6
San Fernando		51·5	294	10 5	+48	—	—	—	39·6
Coimbra		52·3	300	e 9 15	− 7	17 5	+17	e 29·6	—
Zi-ka-wei		54·0	73	—	—	—	—	e 23·0	—
Taihoku		56·3	80	—	—	e 21 5	?SR_1	—	—
Manila		60·4	90	e 10 30	+15	—	—	—	—
Ottawa		91·6	329	—	—	e 24 20	−11	e 36·6	—
Toronto		94·5	330	—	—	—	—	30·5	—
Chicago		99·4	334	—	—	—	—	e 48·6	—
Victoria	E.	99·6	0	—	—	—	—	50·7	61·7
	N.	99·6	0	—	—	—	—	51·0	58·4
La Paz		128·2	272	e 19 35	[+21]	—	—	73·6	83·8

For Notes see next page.

NOTES TO MAY 25d. 22h. 21m. 25s.

Additional readings: Vienna gives also i = +18m.9s. Rocca di Papa SN = +17m.47s. Upsala MN = +26·2m. Hamburg MN = +29·6m. De Bilt MN = +29·4m., MZ = +31·6m. Uccle SR_1 = +17m.47s. Bidston P = +20m.5s. Eskdalemuir e = +19m.35s. Coimbra ePE = +11m.25s., eL = +35·6m. Ottawa e = +30m.50s. Toronto L = +22·2m. and +24·2m.

May 25d. 23h. 35m. 35s. Epicentre 6°·5N. 128°·0E. (as on 1920 Aug. 3d.).

A = −·612, B = +·783, C = +·113; D = +·788, E = +·616;
G = −·070, H = +·089, K = −·994.

Rough.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Manila	10·7	320	e 3 13	+33	—	—
Hong Kong	20·7	322	4 47	− 2	8 35	− 3
Batavia	24·7	239	i 5 6	−29	i 9 54	− 3
Zi-ka-wei	25·5	346	e 5 48	+ 5	—	—

Batavia gives also i = +5m.35s.

May 25d. Readings also at 4h. (Eskdalemuir), 5h. (Innsbruck), 11h. (Nagasaki), 20h. (Nagasaki and Zagreb), 21h. (Moncalieri, Ekaterinburg, and Rocca di Papa), 23h. (Ekaterinburg (2)).

May 26d. 3h. 13m. 30s. Epicentre 36°·5N. 140°·5E. (as on 1923 Jan. 14d.).

A = −·620, B = +·511, C = +·595; D = +·636, E = +·772;
G = −·459, H = +·378, K = −·804.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	2·6	10	0 46	+ 5	1 20	+ 8	—	—
Nagoya		3·2	245	0 58	+ 8	—	—	2·2	2·4
Osaka		4·5	248	1 32	+22	—	—	2·6	3·6
Kobe		4·7	249	1 13	0	—	—	2·7	3·8
Hakodate		5·3	2	0 33	−49	(1 51)	−34	1·8	2·2
Sapporo		6·5	6	3 11	?S	(3 11)	+14	4·3	—
Zi-ka-wei		16·7	257	e 3 57	− 4	e 7 39	+28	—	—
Taihoku		19·9	240	—	—	8 14	− 7	—	—
Hong Kong		26·8	245	6 35	+39	10 55	+18	—	17·8
Manila		28·0	224	e 6 30	+22	—	—	—	—
Batavia		53·1	225	e 9 16	−11	i 16 42	−15	—	—
Ekaterinburg		54·8	320	i 9 34	− 4	17 21	+ 2	27·5	38·8
Victoria	N.	67·2	46	19 41	?S	(19 41)	−11	32·8	38·2
Upsala		72·8	335	—	—	—	—	e 42·5	—
Hamburg		80·3	333	e 12 12	− 9	—	—	e 45·5	—
Vienna		81·8	327	e 12 20	− 9	—	—	—	57·5
Edinburgh		82·5	341	—	—	—	—	e 47·5	—
De Bilt	E.	83·2	334	—	—	—	—	e 43·5	50·9
	N.	83·2	334	—	—	—	—	e 44·5	53·8
Zagreb		83·7	325	—	—	—	—	e 53·9	—
Uccle		84·5	335	—	—	e 22 54	[+ 1]	e 43·5	—
Bidston		84·7	340	—	—	—	—	—	55·0
Strasbourg		85·1	331	—	—	—	—	e 46·5	—
Moncalieri		88·0	330	—	—	e 38 16	?	49·0	—
Rocca di Papa		88·4	324	e 16 35	?PR_1	—	—	e 46·9	58·6
Ottawa		91·8	25	24 4	?S	(24 4)	−29	e 36·0	—
Toronto		92·0	28	—	—	—	—	56·2	—
Toledo		97·0	334	—	—	—	—	e 50·5	—
Coimbra		98·1	338	e 18 45	?PR_1	e 26 10	+33	e 41·5	—
San Fernando	N.	100·8	334	57 30	?L	—	—	(57·5)	69·5
La Paz		147·7	59	e 19 45	[− 7]	—	—	—	—

Additional readings and notes: Mizusawa gives also PN = +45s. Osaka MN = +3·2m. Kobe MN = +3·5m. Ekaterinburg MZ = +35·8m. All readings have been increased by 1h. Victoria P = +19m.44s., SN = +23m.47s., L = +34·3m. Rocca di Papa ePN = +16m.46s. Ottawa S = +30m.18s., L = +46·5m. Toronto L = +32·1m. Coimbra readings have been diminished by 10m.

May 26d. 5h. 29m. 32s. Epicentre 36°·5N. 140°·5E. (as at 3h.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	2·6	10	0 38	− 3	1 13	+ 1	—	—
Nagoya		3·2	245	0 50	0	—	—	—	—
Osaka		4·5	248	1 31	+21	—	—	2·6	2·8
Kobe		4·7	249	—	—	—	—	—	2·7
Hakodate		5·3	2	0 21	−61	—	—	—	—

Mizusawa gives also PN = +37s. Osaka MN = +3·2m.

May 26d. 8h. 42m. 48s. Epicentre 11°·0S. 134°·0E.

A = −·682, B = +·706, C = −·191; D = +·719, E = +·695; G = +·133, H = −·137, K = −·982.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Adelaide		24·3	171	e 5 30	− 1	e 10 0	+10	e 13·9	17·7
Riverview		27·7	148	—	—	e 10 48	− 6	e 12·5	16·0
Melbourne		28·5	162	—	—	(10 6)	−62	10·1	19·2
Manila		28·7	333	e 6 12	− 3	—	—	—	—
Zi-ka-wei		43·9	347	e 8 25	0	—	—	—	—
Honolulu		74·1	64	—	—	—	—	e 26·2	—
Victoria		106·6	42	—	—	—	—	41·7	48·2
Strasbourg		121·8	320	—	—	—	—	e 67·2	—
De Bilt	E.	122·0	325	—	—	—	—	e 58·2	72·9
	N.	122·0	325	—	—	—	—	e 59·2	72·8
Uccle		122·9	323	—	—	—	—	e 58·2	—
Paris		124·9	323	—	—	—	—	e 67·2	74·2
Coimbra		135·8	318	—	—	e 30 42	?	e 70·2	—
Toronto		136·5	35	—	—	—	—	78·4	—
Ottawa		137·3	30	—	—	e 30 42	?	58·2	—

Additional readings and notes: Adelaide gives also e = +15m.6s., i = +16m.12s. Riverview MN = +17·1m., MZ = +19·8m. Toronto L = +53·4m. Ottawa e = +36m.12s., eL = +52·2m.

May 26d. Readings also at 1h. (near Mizusawa), 3h. (near Nagasaki), 4h. (near Mizusawa, Nagoya, Osaka, and Kobe), 5h. (Ekaterinburg and near Mizusawa), 9h. (Zi-ka-wei, near Hokoto, and Taihoku), 10h. (near Mizusawa), 17h. (Zagreb and near Mizusawa), 20h. (Zagreb, near Mizusawa, and near Manila), 21h. (near Mostar), 23h. (Taihoku).

May 27d. 16h. 21m. 36s. Epicentre 28°·5S. 71°·5W. (as on May 4d.).

A = +·279, B = −·833, C = −·477; D = −·948, E = −·317; G = −·151, H = +·453, K = −·879.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Andalgala	N.	4·7	80	1 36	+23	—	—	2·9	3·3
Mendoza		5·2	150	1 48	+28	—	—	2·6	3·1
Pilar	E.	7·3	117	2 48	+57	—	—	3·4	4·2
	N.	7·3	117	3 0	+69	—	—	—	3·7
La Quiaca	E.	8·2	41	4 12	?S	(4 12)	+30	—	5·3
	N.	8·2	41	3 30	?S	(3 30)	−12	4·7	5·7
Cipolletti		10·8	166	5 6	?S	(5 6)	+16	5·9	7·4
La Paz		12·4	15	3 9	+ 4	5 29	0	6·9	7·2
Chacarita	E.	12·7	122	4 54	?S	(4 54)	−43	5·4	7·4
	N.	12·7	122	5 0	?S	(5 0)	−37	6·7	7·0
La Plata	E.	13·2	122	3 23	+ 7	5 30	−19	6·5	7·7
	N.	13·2	122	3 28	+12	5 29	−20	6·4	7·2
Rio de Janeiro		26·1	84	e 5 32	−17	10 2	−22	13·9	16·4
Rio Tinto		89·8	46	50 24	?L	—	—	(50·4)	59·4
Toledo		92·7	45	—	—	—	—	e 38·4	—
Uccle		103·6	39	—	—	—	—	e 54·4	—
Strasbourg		104·4	43	—	—	—	—	e 54·4	—
De Bilt		104·6	38	—	—	—	—	e 54·4	—
Ekaterinburg		136·2	37	21 59	?PR$_1$	—	—	59·4	—

Additional readings and notes: Andalgala readings have been increased by 6m. Mendoza readings diminished by 6m. Ekaterinburg gives also e = +28m.51s., +32m.12s., and +34m.16s.

May 27d. Readings also at 3h. (3) and 6h. (Nagasaki), 11h. (Athens), 13h. (Ekaterinburg), 15h. (Nagasaki, Toledo, Lisbon, and near Coimbra), 16h. (La Paz and La Plata), 19h. (Taihoku (2) and Zi-ka-wei), 20h. (Nagasaki), 22h. (Ekaterinburg).

1923. May 28d. 1h. 25m. 48s. Epicentre 1°·0S. 89°·0E.

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Colombo		12·1	311	2 54	− 6	4 24	−57	5·6	7·7
Batavia		18·5	107	i 4 28	+ 5	i 7 50	− 1	—	—
Malabar		19·6	109	i 4 37	+ 1	i 8 12	− 3	e 11·2	—
Calcutta	E.	23·5	358	3 46	−97	8 15	−80	12·4	15·0
	N.	23·5	358	3 31	−112	8 7	−88	12·9	—
Bombay		25·5	322	5 49	+ 6	10 26	+13	13·1	14·4
Dehra Dun		33·0	343	6 3	−53	11 26	−58	14·0	28·0
Hong Kong		33·8	46	7 2	− 1	12 39	+ 1	17·3	19·7
Simla	E.	34·0	342	—	—	e 12 48	+ 8	—	26·0
	N.	34·0	342	e 7 30	+25	13 6	+26	19·6	25·2
Manila		35·2	63	e 7 22	+ 7	——	—	22·7	25·2
Taihoku		40·8	49	—	—	—	—	e 23·4	—
Zi-ka-wei		44·5	41	e 8 25	− 5	e 15 15	+ 6	—	25·3
Kobe		55·9	47	—	—	—	—	e 32·1	—
Osaka		56·1	47	10 23	+36	18 9	+34	29·7	32·9
Adelaide		57·2	134	e 9 36	−17	i 17 42	− 7	e 29·2	36·0
Tiflis	E.	58·4	323	e 9 24	−37	17 30	− 34	e 29·6	38·5
Ekaterinburg		62·2	345	i 10 33	+ 7	19 6	+15	32·2	38·7
Helwan		63·0	306	10 33	+ 1	—	—	—	39·2
Melbourne		63·1	134	—	—	20 0?	+58	37·1	45·3
Riverview		66·6	128	—	—	e 19 40	− 5	e 27·0	36·0
Sydney		66·6	128	10 42	−13	28 42	?	38·9	40·5
Athens		71·4	312	11 28	+ 2	20 45	+ 2	e 50·2	44·0
Cape Town		73·4	234	24 32	?	—	—	—	36·5
Zagreb		79·0	319	12 12?	− 1	22 12?	0	e 40·2?	—
Vienna		79·3	321	12 13	− 2	22 18	+ 3	e 40·2	56·2
Rocca di Papa		80·5	314	e 12 22	0	i 22 25	− 4	e 53·7	82·8
Upsala		81·7	332	e 12 29	0	22 42	− 1	e 46·2	53·5
Innsbruck		82·4	320	e 12 32	0	—	—	—	—
Zurich		84·3	318	i 12 39	− 5	23 4	− 7	51·2	—
Hamburg		84·4	325	e 12 42	− 2	—	—	e 43·2	55·2
Moncalieri		84·6	316	12 37	− 9	23 19	+ 4	44·5	56·4
Strasbourg		85·0	320	12 45	− 3	23 16	− 3	e 34·2	—
De Bilt	E.	87·1	323	12 55	− 5	23 31	−11	e 43·2	57·6
	N.	87·1	323	—	—	23 36	− 6	—	56·1
Algiers		87·4	309	12 56	− 5	23 36	− 9	42·2	59·7
Uccle		87·4	321	e 12 55	− 6	e 23 29	−16	e 40·2	60·3
Paris		88·5	320	e 13 2	− 6	e 23 34	−24	46·2	61·2
Tortosa	E.	89·5	312	12 57	−16	16 36	?PR_1	—	—
Oxford		90·9	322	—	—	—	—	52·2	62·2
Stonyhurst		91·6	324	e 17 0	?PR_1	30 48	?SR_1	—	63·7
Bidston		92·0	324	6 19	?	12 57	?P	—	37·8
Eskdalemuir		92·1	326	i 13 18	−10	e 24 5	−31	46·2	56·0
Edinburgh		92·1	326	13 20	− 8	24 0	−36	50·2	62·2
Toledo		92·9	310	—	—	—	—	e 73·2	—
San Fernando	E.	94·8	308	14 0?	+18	—	—	—	59·7
Rio Tinto		95·0	309	3 12	?	—	—	—	62·2
Coimbra		96·3	311	19 52	?PR_1	e 24 12	−67	e 45·2	—
Victoria	E.	125·0	25	22 33	?PR_1	—	—	40·8	82·3
	N.	125·0	25	22 25	?PR_1	—	—	51·4	81·7
Ottawa		133·6	345	e 22 57	?PR_1	(e 39 52)	?SR_1	71·2	—
Toronto		136·1	348	—	—	—	—	71·0	105·5
Chicago		139·1	356	22 36	?PR_1	41 7	?SR_1	e 63·2	—
Georgetown	E.	140·0	341	e 23 5	?PR_1	—	—	—	—
La Paz		151·5	231	e 19 48	[−10]	e 33 58	?	74·2	97·8

Additional readings : Batavia gives also i = +4m.56s. Manila MN = +24·3m. Zi-ka-wei MN = +25·7m. Osaka MN = +33·1m. Adelaide eSR_1? = +23m.0s., e = +30m.42s., also for an earlier shock eS? = +16m.12s., eSR_1 = +21m.12s., eL? = +27·7m., M = +34·2m. Tiflis MN = +40·8m. Ekaterinburg PR_1 = +12m.46s., PR_2 = +14m.28s., SR_1 = +22m.58s., SR_2 = +26m.14s., MN = +42·1m., MZ = +42·2m. Riverview MN = +32·2m.

Continued on next page.

Sydney P has been diminished by 10m. Upsala MN = +50·8m. Moncalieri MN = +54·9m. Strasbourg PR_1 = +16m.12s., SR_1 = +24m.20s. De Bilt PR_1 = +16m.25s., SR_1E = +29m.36s., MZ = +57·7m. Algiers PR_1 = +16m.19s., MN = +52·7m. Uccle PR_1 = +16m.18s., SR_1 = +29m.40s. Paris MN = +58·2m. Eskdalemuir PR_1Z = +17m.2s. San Fernando MN = +58·2m. Coimbra eLN = +41·2m. Ottawa gives eSR_1 as eL. Toronto L = +85·2m., +88·0m., and +95·9m. Georgetown eN = +22m.42s. La Paz iP = +20m.1s.

May 28d. Readings also at 1h., 2h., and 3h. (Apia), 4h. (near Mizusawa), 5h. (near Tortosa), 6h. (Wellington), 7h. (La Paz and Wellington), 8h. (Victoria, La Paz, and Honolulu), 9h. (Ekaterinburg), 10h. (near Osaka and Kobe), 12h. (La Paz, Taihoku, and near Athens), 15h. (near Granada) 16h. (near Algiers), 18h. (Ekaterinburg), 19h. (La Paz and La Plata), 21h. (Ekaterinburg), 22h. (Rio Tinto).

May 29d. 11h. 34m. 20s. Epicentre 41°·0N. 30°·0E.

A = +·654, B = +·377, C = +·656 ; D = +·500, E = −·866 ; G = +·568, H = +·328, K = −·755.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	5·7	240	1 32	+ 4	(2 5)	−31	2·1	2·3
Belgrade	7·9	302	i 2 10	+10	i 3 34	0	—	3·7
Mostar	9·2	289	i 2 18	− 1	4 10	+ 2	—	4·3
Zagreb	11·3	300	e 2 48	− 1	e 5 2	0	e 5·2	5·5
Pompeii	11·6	274	4 10	+77	(4 10)	−59	—	—
Vienna	12·0	312	e 5 9	?S	(e 5 9)	−10	—	6·7
Rocca di Papa	13·0	279	e 3 4	− 9	e 5 55	+11	—	6·2
Strasbourg	17·4	303	e 8 40	?L	—	—	(e 8·7)	—
Hamburg	18·4	320	—	—	—	—	e 9·7	—
Uccle	20·2	308	—	—	—	—	e 10·2	—
De Bilt	20·2	312	—	—	—	—	e 10·4	10·8
Ekaterinburg	25·3	41	—	—	e 8 33	−96	30·7	—
Bidston	25·3	311	9 40	?S	(9 40)	−29	—	—

Additional readings and notes : Athens gives also P = +1m.40s., MN = +2·4m. Belgrade P = +2m.25s. Mostar iP = +2m.40s. Zagreb eNE = +2m.52s., MNW = +6·2m. De Bilt MN = +11·0m., MZ = +12·5m. Bidston S = +24m.40s.

May 29d. Readings also at 2h. (Batavia, Malabar, and near Athens (2)), 8h. (Ekaterinburg, Strasbourg, and near Hakodate), 9h. (La Paz, Ekaterinburg, and Riverview), 14h. (Manila), 16h. (near Athens and near Kobe), 18h. (La Paz), 22h. (near Athens), 23h. (Manila and Ekaterinburg).

1923. May 30d. 8h. 30m. 30s. Epicentre **76°·5N. 127°·0E.**

A = −·140, B = +·186, C = +·972 ; D = +·799, E = +·602 ; G = −·585, H = +·776, K = −·233.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ekaterinburg		30·1	269	—	—	—	—	—	22·9
Upsala		36·7	308	e 7 28	0	e 13 0	−20	e 20·0	25·3
Edinburgh		43·9	321	—	—	14 44	−17	—	29·5
Hamburg		44·0	310	e 8 22	− 4	i 14 56	− 6	23·5	26·7
Eskdalemuir		44·4	321	e 8 16	−13	—	—	—	—
Zi-ka-wei		45·4	187	i 8 43	+ 7	e 15 32	+12	—	32·2
De Bilt	E.	46·2	313	—	—	15 25	− 6	e 23·5	30·3
	N.	46·2	313	—	—	15 26	− 5	—	28·3
	Z.	46·2	313	8 38	− 3	—	—	—	33·0
Bidston		46·2	320	7 35	−66	16 20	+49	—	29·1
Uccle		47·2	314	e 8 47	− 1	e 15 42	− 2	e 21·5	—
Victoria	E.	47·5	58	—	—	15 48	0	26·6	33·8
	N.	47·5	58	8 46	− 5	15 43	− 5	26·8	32·5
Oxford		47·6	320	—	—	i 15 42	− 7	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kew		47·7	319	—	—	—	—	—	32·5
Vienna		47·9	302	8 52	− 1	15 49	− 4	—	28·0
Tiflis	N.	47·9	275	e 10 51	?PR$_1$	15 53	0	31·5	34·3
Strasbourg		49·2	310	9 3	+ 2	16 7	− 2	e 26·5	29·8
Innsbruck		49·7	308	e 9 7	+ 2	e 16 6	− 9	e 26·5	36·3
Paris		49·8	315	e 9 4	− 2	e 16 13	− 3	28·5	30·5
Zurich		50·2	310	e 9 23	+15	e 16 20	− 1	—	—
Zagreb		50·2	302	e 9 12	+ 4	e 16 29	+ 8	e 30·5	—
Taihoku		51·6	185	—	—	—	—	e 27·5	—
Moncalieri		52·6	309	9 31	+ 7	16 51	0	26·8	—
Florence		53·1	306	—	—	—	—	—	31·5
Hong Kong		54·6	193	—	—	—	—	—	32·0
Rocca di Papa		54·8	304	i 9 42	+ 4	17 33	+14	—	—
Pompeii		55·4	301	9 32	−10	17 30	+ 4	—	—
Barcelona		57·0	312	—	—	e 17 59	+13	e 30·7	—
Ottawa		57·2	18	e 17 53	?S	(e 17 53)	+ 4	e 26·5	—
Tortosa	N.	57·9	314	10 6	+ 8	—	—	32·9	35·3
Toronto		58·6	21	i 13 45	?	18 2	− 4	26·8	—
Toledo		59·6	319	10 17	+ 8	18 27	+ 9	e 34·5	38·2
Chicago		59·7	29	12 0	+110	22 10	?SR$_1$	e 31·5	—
Coimbra		59·9	322	10 19	+ 8	18 32	+10	31·0	—
Ithaca		60·1	19	—	—	—	—	35·0	—
Algiers		61·4	310	e 10 25	+ 4	18 50	+ 9	e 29·0	42·5
Manila		62·0	187	e 10 30	+ 5	—	—	—	—
Rio Tinto		62·0	319	32 30	?L	—	—	(32·5)	45·5
San Fernando	N.	63·3	319	—	—	—	—	38·5	42·5
Washington		63·5	20	—	—	—	—	38·5	—
Honolulu	N.	65·8	99	—	—	—	—	e 39·5	—
Kodaikanal		71·2	232	41 30	?L	—	—	(41·5)	—
Colombo		74·1	230	30 30	?	—	—	41·0	47·5
La Paz		119·5	15	20 19	?PR$_1$	e 33 58	?	64·9	70·8
Wellington		121·7	139	e 15 12	−39	—	—	—	—

Additional readings: Ekaterinburg gives also MN = +22·5m. Hamburg MN = +31·6m. Eskdalemuir PR$_1$Z = +10m.25s. De Bilt SR$_1$ = +18m.42s. Bidston P = +11m.38s. Uccle PR$_1$ = +10m.36s., SR$_1$ = +19m.0s. Vienna PR$_1$Z = +10m.47s., iE = +12m.41s. Tiflis eE = +15m.31s. and +19m.3s., ME = +31·7m. Paris MN = +35·5m. Zagreb ePR$_1$ = +10m.57s. Rocca di Papa E = +11m.48s., N = +11m.54s., e = +12m.45s., N = +13m.6s., E = +18m.18s. Ottawa L = +30·5m. Tortosa LE = +33·3m. Toronto L = +22·2m. Coimbra ePE = +10m.25s., T$_e$ = 8h.30m.38s. San Fernando LE = +39·0m. Washington e = +29m.30s. Wellington gives several e readings.

1923. May 30d. 17h. 56m. 42s. Epicentre 76°·5N. 127°·0E.

(as at 8h.).

A = −·140, B = +·186, C = +·972; D = +·799, E = +·602; G = −·585, H = +·776, K = −·233.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Upsala		36·7	308	e 7 21	− 7	e 13 0	−20	e 18·3	26·0
Bergen		38·3	317	e 7 18	−22	—	—	—	—
Kobe		42·0	170	—	—	—	—	e 28·6	—
Edinburgh		43·9	321	—	—	14 43	−18	—	28·3
Hamburg		44·0	310	e 8 21	− 5	i 14 55	− 7	e 21·3	26·8
Eskdalemuir		44·4	321	8 26	− 3	e 14 54	−13	—	—
Lemberg		44·8	296	e 8 12	−20	—	—	—	28·8
Zi-ka-wei		45·4	187	i 8 43	+ 7	e 15 19	− 1	—	32·2
Stonyhurst		45·7	320	e 15 48	?S	(15 48)	+24	—	34·3
De Bilt		46·2	313	8 39	− 2	15 26	− 5	e 23·3	28·3
Bidston		46·2	320	9 33	+52	16 18	+47	—	38·5
Uccle		47·2	314	e 8 49	+ 1	e 15 44	0	e 21·3	—
Victoria	E.	47·5	58	9 8	+17	15 47	− 1	24·0	30·3
	N.	47·5	58	9 6	+15	15 55	+ 7	24·4	32·9
Oxford		47·6	320	9 5	+14	i 15 43	− 6	—	32·5
Kew		47·7	319	—	—	—	—	—	36·3
Tiflis	N.	47·9	275	e 9 21	+28	—	—	e 23·3	33·8
Vienna		47·9	302	i 8 53	0	i 15 51	− 2	—	30·8
Strasbourg		49·2	310	8 58	− 3	16 7	− 2	e 22·3	28·1

Continued on next page.

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Innsbruck		49·7	308	e 9 19	+14	—	—	e 26·3	—
Paris		49·8	315	i 9 7	+ 1	i 16 14	− 2	29·3	30·3
Zagreb		50·2	302	e 9 13	+ 5	e 16 24	+ 3	e 28·8	—
Zurich		50·2	310	e 9 8	0	e 16 19	− 2	—	—
Belgrade	E.	50·3	298	e 9 23	+14	e 16 16	− 7	e 28·1	—
Besançon		50·8	312	—	—	—	—	27·3	—
Taihoku		51·6	185	—	—	—	—	e 28·2	—
Moncalieri		52·6	309	9 22	− 2	16 51	0	23·5	—
Florence		53·1	306	10 48	+81	—	—	—	31·8
Hong Kong		54·6	193	—	—	—	—	—	35·3
Rocca di Papa		54·8	304	i 9 45	+ 7	17 24	+ 5	e 27·8	38·3
Pompeii		55·4	301	11 35	+113	—	—	—	—
Ottawa		57·2	18	—	—	i 17 48	− 1	28·3	—
Tortosa	E.	57·9	314	10 7	+ 9	18 11	+13	—	33·3
	N.	57·9	314	i 10 8	+10	i 18 9	+11	29·3	40·8
Toronto		58·6	21	—	—	e 18 10	+ 4	34·5	36·2
Toledo		59·6	319	e 10 20	+11	—	—	—	—
Ann Arbor		59·6	25	e 12 18	?PR_1	—	—	32·3	—
Chicago		59·7	29	12 42	?PR_1	13 18	?	e 33·3	—
Coimbra		59·9	322	10 21	+10	18 31	+ 9	e 34·3	—
Ithaca		60·1	19	—	—	e 18 36	+12	37·3	—
Algiers		61·4	310	10 32	+11	18 48	+ 7	e 33·3	41·3
Manila		62·0	187	e 10 50	+25	—	—	—	—
Rio Tinto		62·0	319	19 18	?S	(19 18)	+30	—	45·3
San Fernando	E.	63·3	319	—	—	28 48	?L	37·3	41·3
	N.	63·3	319	10 48	+14	19 18	+13	39·3	40·8
Honolulu	N.	65·8	99	—	—	e 20 18	+43	—	—
Kodaikanal		71·2	232	39 54	?L	—	—	(39·9)	—
Colombo		74·1	230	28 ·6	?	—	—	40·3	44·8
La Paz		119·5	15	20 27	?PR_1	—	—	66·3	73·5

Additional readings: Upsala gives also $PR_1 = +8m.44s.$, $PR_2 = +8m.54s.$ Kobe eN = +28m.5s. Hamburg i = +8m.34s., MN = +25·1m., MZ = +28·5m. Eskdalemuir $PR_1 = +10m.17s.$ Zi-ka-wei MNZ = +32·6m. De Bilt $SR_1 = +18m.46s.$, MN = +33·5m., MZ = +34·2m. Uccle $PR_1 = +10m.42s.$, $SR_1 = +19m.6s.$, Tiflis eE = +10m.57s., eN = +11m.19s., eN = +25m.55s. and +29m.51s., ME = +39·1m. Vienna iZ = +9m.4s., iE = +9m.26s., iN = +9m.31s., $PR_1 = +10m.46s.$, i = +11m.44s., iN = +12m.43s. and +15m.51s., $SR_1 = +18m.45s.$, iN = +19m.8s., MZ = +36·8m. Strasbourg MN = +34·8m. Paris MN = +35·3m. Zagreb ePR_1 = +11m.34s., eSR_1 = +20m.3s. Belgrade $PR_1 = +11m.42s.$ and +13m.37s., L = +35·3m. Toronto e = +22m.13s. Toledo e = 17h.42m.30s. Coimbra eE = +10m.37s., $T_0 = 17h.56m.55s.$ San Fernando SN = +26m.18s. Kodaikanal reading has been diminished by 1h.

May 30d. Readings also at 2h. (Manila, Zi-ka-wei, Hong Kong, and Ekaterinburg), 3h. (De Bilt), 4h. (Strasbourg), 13h. (Athens, Rocca di Papa, Zagreb, Belgrade, Riverview, Zi-ka-wei, and Wellington), 14h. (Belgrade), 15h. (Apia, Manila, Riverview, Strasbourg, and Zi-ka-wei), 16h. (Ottawa, Georgetown, and Nagasaki), 17h. (Apia and San Fernando), 21h. (Manila), 23h. (Tortosa).

May 31d. 5h. 55m. 35 s. (I) / 6h. 10m. 32s. (II) } Epicentre 35°·5N. 143°·5E.

A = −·654, B = +·484, C = +·581; D = +·595, E = +·804; G = −·467, H = +·345, K = −·814.

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
I Mizusawa	E.	4·1	333	1 2	− 2	1 25	−28	—	—
II	E.	4·1	333	0 56	− 8	1 26	−27	—	—
I Nagoya		5·3	268	1 5	−17	(2 15)	−10	2·2	3·8
II		5·3	268	1 7	−15	(2 30)	− 5	2·3	2·4
I Hakodate		6·6	342	1 44	+ 3	(2 56)	− 4	2·9	3·6
II		6·6	342	1 39	− 2	(2 56)	− 4	2·9	4·4
I Osaka		6·6	265	1 43	+ 2	(3 7)	+ 7	3·1	3·8
II		6·6	265	1 49	+ 8	(3 4)	+ 4	3·1	3·9
I Kobe		6·8	265	(1 47)	+ 3	1 47	?P	2·4	2·7
II		6·8	265	(1 54)	+10	1 54	?P	2·4	2·5

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Nagasaki	11·6	260	2 35	−18	(5 34)	+25	5·6	—
I Zi-ka-wei	18·9	263	e 4 25	− 3	e 8 6	+ 6	—	12·0
I Taihoku	21·6	247	—	—	8 59	+ 2	—	—
I Hong Kong	28·7	251	—	—	—	—	—	17·9
I Manila	29·1	230	e 7 10	+51	—	—	—	—
I Batavia	54·1	228	e 9 31	− 3	i 16 55	−15	—	—
I Colombo	64·6	260	30 25	?L	—	—	(30·4)	42·4
I Tiflis	73·0	310	e 14 13	?PR_1	—	—	e 38·7	—
I Upsala	74·8	335	—	—	—	—	e 39·4	46·9
I Hamburg	82·3	334	—	—	—	—	e 44·4	—
I Vienna	83·9	328	e 12 34	− 7	—	—	—	54·4
I Edinburgh	84·3	342	—	—	—	—	e 44·4	62·4
I Eskdalemuir	84·8	342	—	—	—	—	44·4	—
I De Bilt	85·1	336	e 12 44	− 5	e 23 11	− 9	e 43·4	58·9
I Zagreb	85·9	326	e 12 25	−28	—	—	e 47·4	—
I Stonyhurst	85·9	340	e 48 25	?L	—	—	(e 48·4)	54·4
I Uccle	86·4	336	—	—	—	—	e 44·4	—
I Bidston	86·4	340	—	—	—	—	—	57·4
I Strasbourg	87·2	332	e 12 25	−35	—	—	—	54·5
I Moncalieri	90·1	330	e 41 35	?	—	—	49·5	—
I Ottawa	91·7	26	—	—	e 24 17	−15	e 39·4	—
I Toronto	91·8	30	—	—	—	—	53·4	—
I Tortosa	96·4	333	—	—	—	—	e 50·4	62·7
I Algiers	98·9	329	—	—	—	—	e 59·4	62·4
I Coimbra	100·0	339	—	—	—	—	54·4	—
I La Paz	146·0	65	19 57	[+ 7]	—	—	—	—
II	146·0	65	19 53	[+ 3]	—	—	—	—

Additional readings: Mizusawa gives also I SN = +1m.26s., II SN = +1m.30s. Hakodate I MN = +4·3m., II MN = +3·6m. Osaka I MN = +3·4m. Kobe I P = +59s., II P = +52s. Zi-ka-wei I MN = +12·1m. Tiflis I eLE = +45·3m. De Bilt I MN = +54·0m., MZ = +59·0m. Strasbourg I MN = +36·4m. Ottawa I e = +30m.25s., L = +50·4m. Toronto I L = +62·6m. Tortosa I MN = +57·3m. Coimbra I e = +35m.25s., e = +43m.55s., LN = +57·4m.

May 31d. 22h. 5m. 48s. Epicentre 31°·3N. 41°·0W.

A = +·645, B = −·561, C = +·520; D = −·656, E = −·755; G = +·392, H = −·341, K = −·854.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Azores		14·1	59	6 6	?S	(6 6)	− 4	—	7·4
Coimbra		27·7	62	6 14	+ 9	10 58	+ 4	13·4	15·2
Rio Tinto		28·9	68	13 12	?L	—	—	(13·2)	20·2
San Fernando	E.	29·2	70	6 24	+ 4	11 30	+10	13·7	15·2
	N.	29·2	70	6 48	+28	12 42	+82	14·7	16·2
Georgetown		30·2	292	e 5 50	−40	—	—	e 15·8	—
Ithaca		30·3	301	—	—	e 11 42	+ 3	e 14·7	—
Ottawa		30·4	308	6 31	− 1	11 40	− 1	e 14·2	—
Toledo		31·0	65	6 47	+ 9	11 46	− 5	e 12·8	—
Granada		31·3	70	i 6 44	+ 3	e 11 6	−50	e 15·4	16·8
Toronto		32·5	304	6 49	− 4	12 14	− 2	16·0	—
Tortosa		34·6	63	7 9	− 1	i 12 47	− 2	15·9	19·6
Bidston		35·0	40	—	—	—	—	—	19·0
Ann Arbor		35·5	300	—	—	e 12 54	− 9	17·9	—
Stonyhurst		35·6	41	e 13 12	?S	(e 13 12)	+ 8	—	—
Eskdalemuir		35·8	38	e 7 21	+ 1	—	—	—	—
Barcelona		35·8	62	—	—	—	—	e 16·9	—
Kew		35·9	44	—	—	—	—	—	20·2
Edinburgh		36·0	38	e 7 18	− 4	17 42	?L	(17·7)	18·2
Algiers		36·6	69	e 7 24	− 3	13 15	− 3	18·2	20·2
Chicago		38·4	299	6 41	−60	13 45	+ 1	19·4	—
Uccle		38·6	47	e 7 42	− 1	e 13 41	− 5	e 17·2	—
Besançon		39·0	52	7 45	− 1	—	—	—	—
De Bilt		39·3	45	7 49	0	13 57	+ 1	e 18·6	21·3
Moncalieri		40·0	56	7 53	− 2	14 8	+ 1	21·7	—
Strasbourg		40·3	50	7 56	− 1	14 11	0	20·2	24·6
Hamburg		42·5	44	e 8 14	− 1	e 14 43	+ 1	e 21·2	—
Innsbruck		42·7	52	e 8 18	+ 2	—	—	—	—

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		43·7	60	e 8 42	+18	14 48	−10	22·2	26·0
Zagreb		45·8	55	e 8 42	+ 3	—	—	—	—
Vienna		46·1	50	i 8 42	+ 1	—	—	—	24·2
Upsala		47·7	35	e 8 54	+ 2	e 15 50	0	—	—
La Paz		54·5	211	i 9 51	+15	17 33	+18	27·2	31·1
Victoria		62·4	312	7 59	?	19 14	+21	31·8	35·6
Honolulu	E.	99·9	303	—	—	—	—	e 51·2	—

Additional readings and notes: San Fernando gives also two readings for N component +10m.48s. and +12m.42s. Ottawa L = +15·7m., T_o = 22h.5m.48s. Toronto PR_1 = +11m.22s., L = +16·2m., also another set of readings, T_o = 22h.5m.47s. Tortosa MN = +16·6m. Chicago PR_1 = +9m.7s. Uccle PR_1 = +9m.15s. De Bilt MZ = +21·4m., MN = +21·6m. Strasbourg MN = +24·4m. Rocca di Papa e = +6m.30s. Victoria LN = +33·2m., MN = +36·3m. Honolulu eN = +52·2m.

May 31d. Readings also at 3h. (De Bilt), 6h. (near Mizusawa and Osaka and near Nagasaki (2)), 7h. (Ekaterinburg), 8h. (near Mizusawa and Osaka), 10h. (Colombo), 11h. (Simla), 12h. (near Algiers), 13h. (Ekaterinburg), 17h. (Manila), 18h. (La Paz), 19h. (Taihoku), 21h. (Riverview), 22h. (near Taihoku), 23h. (near Manila).

June 1d. 15h. 31m. 25s. Epicentre 30°·0S. 70°·0W. (as on 1923 Jan. 20d.).

A = +·296, B = −·814, C = −·500; D = −·940, E = −·342; G = −·171, H = +·470, K = −·866.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mendoza		3·2	154	1 11	+21	—	—	1·6	1·8
Andalgala	N.	4·0	55	1 47	+45	—	—	2·2	2·6
Pilar	E.	5·5	109	1 29	+ 4	—	—	3·9	4·1
La Quiaca		8·7	27	4 5	?S	(4 5)	+ 9	4·9	5·3
Cipolletti		9·1	170	4 29	?S	(4 29)	+23	5·1	5·5
Chacarita	E.	10·8	118	2 41	0	—	—	3·8	4·7
	N.	10·8	118	2 59	+18	—	—	3·6	4·6
La Plata	E.	11·3	118	3 2	+13	4 58	− 4	5·9	7·6
	N.	11·3	118	2 48	− 1	4 42	−20	5·7	7·4
La Paz		13·6	8	3 23	+ 2	e 6 3	+ 5	7·5	8·7
Rio de Janeiro	E.	25·0	80	—	—	—	—	e 12·5	13·4
Ekaterinburg		136·7	37	—	—	—	—	73·6	—

Additional readings and notes: Mendoza readings have been diminished by 2m. Andalgala readings have been increased by 4m. Pilar gives also LN = +3·5m., MN = +3·9m. La Quiaca PN = +4m.29s. La Plata E = +6m.6s. T_o = 15h.31m.55s.

1923. June 1d. 17h. 24m. 35s. (I)
20h. 15m. 35s. (II) } Epicentre **36°·0N. 142°·0E.**

A = −·638, B = +·498, C = +·588; D = +·616, E = +·788; G = −·463, H = +·362, K = −·809.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Mizusawa	E.	3·2	348	1 1	+11	1 13	−15	—	—
I Nagoya		4·2	260	1 4	− 1	—	—	2·1	—
II		4·2	260	0 35	−30	(1 35)	−20	1·6	—
I Osaka		5·5	258	1 30	+ 5	—	—	2·6	3·8
II		5·5	258	1 30	+ 5	—	—	2·8	3·4
I Kobe		5·8	259	1 33	+ 3	1 47	−52	3·0	3·2
II		5·8	259	1 31	+ 1	1 50	−49	2·8	3·2
I Hakodate		5·9	351	1 50	+19	—	—	3·0	3·2
II		5·9	351	1 54	+23	—	—	3·1	3·8
I Sapporo		7·1	355	2 12	+24	(3 2)	−11	3·0	—
II		7·1	355	2 2	+14	(3 15)	+ 2	3·2	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Nagasaki		10·6	256	2 26	−12	—	—	5·0	6·8
II		10·6	256	2 31	− 7	—	—	5·1	5·9
I Ootomari		10·7	3	2 52	+12	—	—	5·4	7·4
II		10·7	3	2 45	+ 5	—	—	5·0	8·0
I Zi-ka-wei		17·8	260	i 4 10	− 5	e 7 30	− 6	—	11·8
II		17·8	260	i 4 10	− 5	e 7 32	− 4	—	11·7
I Taihoku		20·7	244	e 4 47	− 2	(8 53)	+15	8·9	14·7
II		20·7	244	e 4 45	− 4	(8 46)	+ 8	8·8	14·9
I Hokoto		23·1	243	5 54	+36	(9 57)	+30	10·0	—
II		23·1	243	e 6 1	+43	—	—	—	—
I Hong Kong		27·9	248	5 52	−15	10 45	−12	14·9	18·4
II		27·9	248	5 52	−15	10 24	−33	—	18·4
I Manila		28·5	227	e 6 5	− 8	—	—	13·2	14·7
II		28·5	227	e 6 3	−10	—	—	13·7	14·7
I Calcutta	E.	48·1	271	8 56	+ 1	16 13	+18	24·0	27·7
I	N.	48·1	271	8 39	−16	—	—	—	28·8
II	E.	48·1	271	8 20	−35	15 37	−18	22·6	—
II Simla	E.	53·3	285	9 37	+ 9	17 7	+ 7	34·8	35·3
I Batavia		53·6	226	i 9 25	− 5	i 16 51	−13	e 25·4	—
II		53·6	226	i 9 17	−13	16 38	−26	36·7	—
I Honolulu	N.	53·7	89	9 33	+ 2	17 14	+ 9	23·8	30·1
II	N.	53·7	89	—	—	17 12	+ 7	25·0	26·0
I Malabar		54·0	225	9 30	− 3	—	—	—	—
II		54·0	225	9 27	− 6	—	—	—	—
I Ekaterinburg		56·1	321	i 9 47	0	—	—	—	—
II		56·1	321	i 9 48	+ 1	i 17 30	− 5	24·4	—
I Sitka	E.	56·6	42	e 10 38	+48	17 54	+13	31·6	43·0
I	N.	56·6	42	e 9 32	−18	18 9	+28	35·6	39·4
I Bombay		62·5	275	10 34	+ 5	19 10	+15	31·5	—
II		62·5	275	10 32	+ 3	18 57	+ 2	—	—
I Colombo		63·5	261	11 19	+44	19 55	+48	40·4	43·0
II		63·5	261	—	—	—	—	—	43·4
I Kodaikanal		63·5	266	11 31	+56	—	—	41·8	51·6
II		63·5	266	10 31	− 4	—	—	40·0	43·1
I Apia		66·2	130	25 25	?	—	—	—	—
II		66·2	130	—	—	—	—	32·4	—
I Victoria	E.	66·7	47	11 10	+14	20 0	+14	33·1	45·4
I	N.	66·7	47	11 9	+13	19 59	+13	28·4	36·2
II	E.	66·7	47	11 6	+10	19 58	+12	33·5	41·4
II	N.	66·7	47	11 16	+20	20 9	+23	29·5	35·5
I Riverview		70·4	173	e 11 23	+ 4	i 20 31	0	e 30·8	37·6
II		70·4	173	e 11 22	+ 3	20 31	0	e 30·6	35·3
I Sydney		70·4	173	20 31	?S	(20 31)	0	30·5	35·5
II		70·4	173	20 31	?S	(20 31)	0	30·7	36·9
I Adelaide		71·1	183	—	—	i 20 37	− 2	e 31·4	36·2
II		71·1	183	—	—	i 20 37	− 2	e 28·0	31·2
I Tiflis		71·7	310	e 11 33	+ 5	e 20 49	+ 3	e 35·2	47·5
II		71·7	310	e 11 35	+ 7	e 20 45	− 1	e 34·9	46·5
I Melbourne		73·9	178	(i 10 49)	−52	—	—	i 10·8	43·0
II		73·9	178	—	—	(20 13)	−60	20·2	21·2
I Upsala		73·9	334	e 11 45	+ 4	21 14	+ 1	e 35·4	46·8
II		73·9	334	e 11 44	+ 3	21 13	0	e 38·4	50·5
I Bergen		77·3	342	10 28	−95	20 10	−102	35·5	41·2
II		77·3	342	—	—	—	—	e 36·4	—
I Lemberg		78·2	325	e 12 1	− 7	—	—	e 38·9	50·4
II		78·2	325	e 12 7	− 1	—	—	e 43·3	49·5
I Hamburg		81·3	335	i 12 27	0	i 22 39	+ 1	e 41·4	49·2
II		81·3	335	e 12 27	0	i 22 38	0	e 41·4	48·9
I Vienna		82·9	329	e 12 34	− 1	e 22 50	− 6	e 40·4	54·9
II		82·9	329	e 12 35	0	22 51	− 5	e 46·4	52·9
I Wellington		83·0	157	—	—	e 22 55	− 2	42·2	—
II		83·0	157	—	—	e 22 55	− 2	32·2	—
I Belgrade		83·5	324	e 12 30	− 9	e 22 48	−15	e 40·5	53·4
II		83·5	324	e 12 30	− 9	e 22 50	−13	e 45·0	—
I Edinburgh		83·5	343	12 40	+ 1	23 3	0	38·4	50·9
II		83·5	343	12 50	+11	23 0	− 3	41·4	63·4
I Eskdalemuir		84·0	343	12 41	− 1	23 8	0	41·4	55·1
II		84·0	343	12 41	− 1	23 7	− 1	41·4	54·6
I De Bilt		84·2	337	12 42	− 1	23 8	− 2	e 39·4	50·8
II		84·2	337	12 42	− 1	23 8	− 2	e 39·4	53·9
I Zagreb	N.E.	84·9	327	e 12 45	− 2	e 23 9	− 9	e 42·4	54·9
II		84·9	327	e 12 46	− 1	e 23 9	− 9	e 42·2	58·5
I Stonyhurst		85·0	341	e 12 55	+ 7	23 19	0	47·9	54·9
II		85·0	341	—	—	23 25	+ 6	48·1	54·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Uccle	85·6	336	e 12 48	− 3	23 18	− 8	e 37·4	51·6
II		85·6	336	e 12 48	− 3	23 18	− 8	e 39·4	50·5
I	Bidston	85·6	341	12 47	− 4	23 28	+ 2	—	55·6
II		85·6	341	12 50	− 1	—	—	—	—
I	Innsbruck	85·8	330	e 12 56	+ 4	i 23 21	− 7	e 42·4	54·9
II		85·8	330	e 12 50	− 2	i 23 21	− 7	e 47·4	57·1
I	Travnik	86·0	324	—	—	—	—	—	107·4
I	Strasbourg	86·2	333	12 54	0	23 25	− 7	e 40·4	56·0
II		86·2	333	12 53	− 1	23 23	− 9	e 39·4	52·4
I	Kew	86·5	339	23 25	?S	(23 25)	−11	—	53·4
II		86·5	339	—	—	—	—	—	58·4
I	Oxford	86·6	340	12 54	− 3	i 23 31	− 6	38·5	58·8
II		86·6	340	12 54	− 3	i 23 31	− 6	—	38·0
I	Athens	86·7	318	e 12 57	0	e 23 15	−23	e 41·4	59·3
II		86·7	318	e 12 49	− 8	e 23 14	−24	e 40·4	56·1
I	Zurich	86·9	331	13 25?	+27	e 23 33	− 7	e 42·4	—
II		86·9	331	13 5?	+ 7	e 23 32	− 8	—	—
I	Helwan	87·4	307	e 12 57	− 4	23 23	−22	—	55·8
I	Paris	87·9	336	e 13 4	0	e 23 42	− 9	45·4	49·4
II		87·9	336	e 13 10	+ 6	e 23 44	− 7	48·4	60·4
I	Besançon	88·0	335	13 1?	− 4	23 43	− 9	42·4	—
II		88·0	335	13 33	+28	23 41	−11	47·4	—
I	Florence	88·6	329	13 0	− 8	23 35	−24	—	56·0
II		88·6	329	12 25	−43	23 5	−54	—	60·8
I	Moncalieri	89·1	331	12 13	−58	i 23 46	−18	39·6	51·9
II		89·1	331	13 34	+23	23 48	−16	36·6	51·7
I	Pompeii	89·4	324	e 13 25	+13	e 24 25	+18	42·4	58·4
II		89·4	324	e 14 25	+73	—	—	—	—
I	Rocca di Papa	89·5	326	e 13 7	− 6	23 55	−14	e 43·4	52·2
I	N.	89·5	326	i 12 58	−15	24 25	+16	e 44·6	59·6
II		89·5	326	13 21	+ 8	23 37	−32	i 47·1	61·0
I	Chicago	89·9	36	13 15	0	23 40	−33	42·1	—
II		89·9	36	13 22	+ 7	23 39	−34	42·1	—
I	Puy de Dôme	90·4	333	e 13 25?	+ 7	e 24 10	− 8	41·4	54·4
II		90·4	333	—	—	e 23 25	[− 5]	47·4	59·4
I	Ann Arbor	91·3	33	23 55	?S	(23 55)	−32	63·4	—
II		91·3	33	23 55	?S	(23 55)	−32	46·9	—
I	Marseilles	91·5	331	e 13 25	+ 1	e 24 5	−24	50·4	55·4
II		91·5	331	—	—	—	—	45·4	—
I	Ottawa	91·8	26	13 25	− 1	23 51	[+12]	49·9	54·9
II		91·8	26	—	—	23 48	[+ 9]	46·4	57·9
I	Toronto E.	91·9	30	—	—	23 52	[+13]	45·4	56·0
I	N.	91·9	30	13 33	+ 7	23 49	[+10]	45·8	64·1
II	E.	91·9	30	—	—	23 53	[+14]	30·6	57·1
II	N.	91·9	30	17 3	?	e 23 49	[+10]	30·7	63·6
I	Northfield	93·9	25	14 43	+66	24 39	−16	e 45·4	—
II		93·9	25	—	—	—	—	e 52·4	—
I	Ithaca	94·0	28	—	—	e 23 43	[− 9]	48·4	—
II		94·0	28	—	—	i 24 1	[+ 9]	51·4	—
I	Barcelona	94·2	332	16 52	?	—	—	e 45·7	60·1
II		94·2	332	—	—	—	—	e 48·2	—
I	Tortosa E.	95·5	333	—	—	24 46	−25	—	62·8
I	N.	95·5	333	13 40	− 6	i 24 53	−18	45·9	58·8
II	E.	95·5	333	—	—	24 53	− 8	—	60·0
II	N.	95·5	333	13 46	0	24 11	[+11]	39·8	58·4
I	Georgetown	96·8	30	e 16 2	+129	24 23	[+16]	52·2	58·4
II		96·8	30	e 13 56	+ 3	e 24 23	[+16]	53·6	—
I	Washington	96·8	30	13 59	+ 6	24 17	−67	e 48·4	—
II		96·8	30	—	—	24 20	−64	e 53·4	—
I	Cheltenham E.	97·0	30	—	—	e 28 56	+210	52·9	58·7
I	N.	97·0	30	—	—	e 26 52	+86	49·5	62·1
I	Algiers	97·8	329	e 13 41	−18	24 41	−53	e 46·4	63·4
II		97·8	329	e 13 45	−14	e 24 50	−44	48·4	63·8
I	Toledo	98·0	336	e 13 47	−13	e 24 42	−54	e 49·6	65·9
II		98·0	336	e 13 49	−11	24 41	−55	53·4	65·0
I	Coimbra E.	99·0	340	13 51	−14	25 32	−14	46·9	63·9
I	N.	99·0	340	—	—	25 23	−23	—	65·4
II	E.	99·0	340	17 55	?PR_1	e 28 55	?	50·4	56·5
II	N.	99·0	340	—	—	—	—	53·4	62·5
I	Granada	100·2	335	14 6	− 6	25 41	−17	e 49·7	55·0
II		100·2	335	i 14 34	+22	25 25	−33	e 55·0	59·0
I	Lisbon	100·7	339	e 18 12	?PR_1	—	—	e 50·7	—
II		100·7	339	—	—	—	—	e 54·7	—
I	Rio Tinto	100·7	337	17 25	?PR_1	—	—	—	67·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I San Fernando	E.	101·8	336	14 43	+24	25 43	−30	49·4	66·4
I	N.	101·8	336	14 19	0	25 25	−48	35·4	68·9
II	N.	101·8	336	18 19	?PR_1	24 55	[+22]	56·4	68·9
I Azores		105·4	352	27 31	?S	(27 31)	+45	—	70·4
I Accra		125·5	312	47 25	?L	—	—	(47·4)	60·9
I Cape Town		134·3	255	—	—	—	—	—	78·2
II		134·3	255	—	—	—	—	—	79·6
I La Paz		146·9	62	19 56	[+ 5]	i 33 52	?	69·4	94·4
II		146·9	62	i 20 0	[+ 9]	33 38	?	70·0	73·7
I La Quiaca	E.	152·2	68	27 13	?PR_1	—	—	92·2	115·3
I	N.	152·2	68	29 55	?S	—	—	91·3	129·8
I Andalgala	N.	154·6	79	31 13	?S	—	—	—	109·2
II	N.	154·6	79	40 25	?SR_1	—	—	—	113·9
I Mendoza		154·9	92	31 43	?	—	—	90·5	96·4
II		154·9	92	25 43	?PR_1	—	—	78·8	95·9
I Cipolletti		156·0	106	30 13	?	—	—	22·9	91·0
II		156·0	106	—	—	—	—	76·9	102·1
I Pilar	E.	158·1	86	31 19	?	—	—	—	125·6
I Rio de Janeiro		166·1	20	—	—	(e 27 25)	?	e 88·8	—
II		166·1	20	—	—	—	—	e 85·4	—

Additional readings and notes : Osaka gives also I MN = +3·7m. Hakodate I MN = +4·6m. Nagasaki I MN = +6·7m., II MN = +6·2m. Ootomari I MN = +7·5m., II MN = +8·6m. Zi-ka-wei I MN = +10·4m., II MN = +12·0m. Taihoku I MN = +12·3m., II MN = +17·5m. Hong Kong I PR_1 = +6m.45s., II PR_1 = +6m.42s. Manila II MN = +14·4m. Calcutta II PN = +8m.27s. Batavia I i = +13m.25s., L = +40·7m., II e = 20h.23m.0s., i = +16m.44s. Honolulu I SR_1N = +20m.47s., SR_2N = +22m.25s., LN = +24·5m., T_0 = 17h.24m.31s., II LN = +23·6m., and +24·8m. Sitka I SR_1N = +23m.22s., eE = +26m.45s., eN = +26m.38s., LE = +37·4m., T_0 = 17h.23m.47s. Riverview I MN = +38·8m., T_0 = 17h.24m.48s., II MNZ = +42·3m., T_0 = 20h.15m.47s. Sydney I S = +25m.37s., II S = +25m.19s. Adelaide I e = +21m.25s., eSR_1 = +27m.1s., eSR_2 = +27m.25s., three other sets of readings are given for I. Tiflis I eN = +14m.27s., eN = +24m.31s., MN = +47·3m., II eN = +13m.50s., eE = +21m.32s., MN = +40·2m. Upsala I MN = +47·0m., II MN = +50·7m. Hamburg I MN = +57·5m., MZ = +55·7m., II MZ = +53·9m., MN = +56·1m. Vienna I iP = +12m.38s., iZ = +13m.54s., and +13m.43s., PR_1 = +15m.48s., iN = +19m.47s., iSE = +22m.55s., iSN = +22m.57s., iN = +30m.49s., MN = +53·7m., II iPZ = +12m.45s., PR_1 = +15m.51s., MZ = +54·9m. Wellington I e = +22m.49s., +27m.49s., +35m.31s., II iS = +22m.45s., e = +25m.55s., e = +36m.55s. Belgrade I iP = +12m.33s., PR_1 = +15m.48s., SR_1 = +26m.27s., II iP = +13m.40s., PR_1 = +20m.9s., SR_1 = +35m.0s. Edinburgh I SR_1 = +28m.31s., II SR_1 = +28m.31s. De Bilt I PR_1Z = +15m.59s., SR_1E = +28m.41s., MN = +55·1m., MZ = +59·0m., II PR_1Z = +15m.58s., SR_1E = +28m.40s., MZ = +58·2m., MN = +59·2m. Zagreb I ePNW = +12m.42s., ePR_1NE = +16m.5s., ePR_2NE = +19m.9s., eSR_1NE = +28m.37s., MNW = +48·2m., II ePR_1 = +16m.0s., MNW = +48·3m. Uccle I PR_1 = +16m.7s., MN = +54·4m., II MN = +59·9m. Innsbruck I MNW = +50·4m., II MNW = +53·9m. Strasbourg I PR_1 = +16m.22s., MN = +55·9m., II MN = +60·0m. Athens I PR_1 = +16m.23s., iSEN = +23m.26s., MN = +59·1m., II PR_1 = +16m.27s., MN = +61·1m. Helwan I PR_1 = +16m.25s. Paris I MN = +57·4m. Moncalieri I MN = +63·6m., II MN = +58·8m. Rocca di Papa I iS = +16m.55s., II S = +16m.39s. Chicago I PR_1 = +17m.25s., SR_1 = +30m.9s., L = +51·4m., II PR_1 = +16m.55s., SR_1 = +30m.7s., L = +49·4m. Ann Arbor I SR_1? = +30m.37s. Ottawa I PR_1 = +17m.11s., i = +24m.14s., and +25m.25s., SR_1 = +29m.55s., T_0 = 17h.25m.31s. Toronto I iN = +24m.20s., iE = +24m.23s., SR_1E = +30m.33s., LN = +49·1m., II iSN = +23m.51s., iE = +24m.23s. Northfield I L = +50·4m. Ithaca I e = +30m.25s. and +39m.25s., L = +51·4m., +55·4m., II e = +23m.1s., L = +57·4m. Barcelona I MN = +61·7m. Georgetown I eN = +16m.49s. and several L's, II ePN? = +13m.59s., LN = 62·6m. Washington I PR_1 = +17m.51s., L = +63·4m. Algiers I PR_1 = +17m.33s., PR_2 = +19m.46s., II PR_1 = +17m.42s. Toledo I MNW = +61·0m., II MNW = +63·2m. Coimbra I SR_1E = +32m.21s., T_0 = 17h.24m.37s. Granada I PR_1 = +16m.8s., PR_2 = +18m.39s., MN = +62·2m., II i = +18m.15s., MN = +63·3m. San Fernando I SN = +23m.55s., SE = +29m.37s., II MN = +67·4m. La Paz II S = +34m.18s.

June 1d. Readings also at 0h. (Rocca di Papa), 11h. (Zagreb and Florence), 16h. (Perth, Berkeley, and La Paz), 19h. (Berkeley and near Osaka (4)), 20h. (Berkeley, Zagreb), 21h. (near Osaka and Mizusawa), 22h. (near Mizusawa), 23h. (La Paz, Nagasaki, and Algiers).

June 2d. 0h. 47m. 0s. (I)
3h. 12m. 30s. (II)
4h. 53m. 45s. (III)
21h. 58m. 10s. (IV)
Epicentre 36°·0N. 142°·0E. (as on June 1d.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Mizusawa	E.	3·2	348	0 53	+ 3	1 19	− 9	—	—
II	E.	3·2	348	0 56	+ 6	1 37	+ 9	—	—
II	N.	3·2	348	0 57	+ 7	1 35	+ 7	—	—
III	E.	3·2	348	0 54	+ 4	1 15	−13	—	—
IV	E.	3·2	348	1 19	+29	1 57	+29	—	—
IV	N.	3·2	348	1 22	+32	1 58	+30	—	—
II Nagoya		4·2	260	1 1	− 4	—	—	—	—
III		4·2	260	1 19	+14	—	—	—	—
IV		4·2	260	0 50	−15	—	—	—	—
I Osaka		5·5	258	1 29	+ 4	—	—	2·7	3·3
II		5·5	258	1 36	+11	—	—	2·8	3·1
IV		5·5	258	1 31	+ 6	(2 43)	+12	2·7	3·3
II Kobe		5·8	259	1 24	− 6	(2 38)	− 1	2·6	3·0
IV		5·8	259	1 30	0	(2 33)	− 6	2·5	4·2
II Zi-ka-wei		17·8	260	e 4 10	− 5	—	—	—	11·3
IV		17·8	260	e 4 16	+ 1	—	—	—	—
I Victoria	E.	66·7	47	—	—	—	—	36·0	37·0
I	N.	66·7	47	—	—	—	—	36·3	37·3
II Vienna	Z.	82·9	329	e 12 34	− 1	—	—	—	—
II De Bilt		84·2	337	—	—	—	—	e 47·5	—
I Strasbourg		86·2	333	e 13 0	+ 6	—	—	e 33·0	73·0
I Moncalieri		89·1	331	13 32	+21	24 30	+26	70·3	—
I Algiers		97·8	329	e 14 31	+32	e 25 30	− 4	e 44·0	69·0

Additional readings: Mizusawa I gives also PN = +52s. Osaka II MN = +3·2m., IV MN = +3·2m. Kobe II PR_1 = +1m.33s., IV PR_1 = +1m.50s. De Bilt II eLN = +48·5m.

June 2d. 0h. 54m. 36s. Epicentre 40°·8N. 24°·5E.

A = +·689, B = +·314, C = +·653; D = +·415, E = −·910; G = +·595, H = +·271, K = −·757.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		2·9	192	e 0 45	0	e 1 19	− 1	1·4	1·9
Belgrade		5·0	325	e 1 26	+ 9	e 3 16	?L	(e 3·3)	5·5
Pompeii		7·5	273	2 20	+26	2 45	−39	—	3·4
Zagreb	N.E.	8·0	312	e 1 54	− 7	e 3 36	− 1	—	5·1
	N.W.	8·0	312	e 1 53	− 8	e 3 47	+10	e 4·6	5·8
Rocca di Papa		8·9	280	2 12	− 3	i 4 0	− 1	—	4·5
Vienna		9·5	325	e 4 1	?S	(e 4 1)	−15	—	7·4
De Bilt	E.	17·4	317	—	—	e 7 30	+ 3	e 9·6	—
Ekaterinburg		28·2	43	—	—	(10 24)	−39	10·4	—

Additional readings and notes: Athens gives also P = +51s., MN = +2·1m. Belgrade readings have been increased by 50m. Zagreb eNE = +2m.35s., eNW = +3m.15s. Rocca di Papa e = +1m.30s. De Bilt eL = +9·9m.,

June 2d. 1h. 1m. 15s. Epicentre 54°·0S. 22°·5W.

A = +·543, B = −·225, C = −·809; D = −·383, E = −·924; G = −·748, H = +·310, K = −·588.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Cipolletti		34·1	277	13 57	?S	(13 57)	+75	24·2	27·6
Rio de Janeiro		34·8	324	e 8 29	+78	12 43	− 9	15·4	19·9
Cape Town		34·9	71	—	—	—	—	—	22·8
Pilar	E.	36·8	290	8 39	+71	—	—	16·6	36·0
	N.	36·8	290	9 15	?PR_1	—	—	17·0	31·6
Mendoza		38·4	283	10 9	?PR_1	—	—	20·6	30·4
Andalgala	N.	41·3	291	14 27	?S	(14 27)	+ 2	22·8	24·8
La Paz		51·4	299	i 9 13	− 3	i 16 32	− 4	24·8	42·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Adelaide		89·6	165	—	—	e 23 21	[− 5]	e 47·8	52·4
Riverview		92·0	175	—	—	—	—	—	51·7
San Fernando		92·4	13	23 27	?S	(23 27)	[−16]	—	59·2
Rio Tinto		92·8	13	36 45	?	—	—	—	57·2
Coimbra		95·0	11	22 6	?	32 10	?SR_1	48·8	—
Toledo		95·2	14	—	—	e 26 45	+97	—	—
Tortosa	E.	96·8	17	—	—	—	—	e 58·8	79·2
	N.	96·8	17	—	—	24 22	−62	e 42·8	55·8
Kodaikanal		104·1	90	54 51	?L	—	—	(54·8)	—
Zagreb		105·0	27	—	—	—	—	e 59·8	—
Kew		107·1	14	—	—	—	—	—	62·8
De Bilt	E.	108·6	19	—	—	—	—	e 53·8	60·9
	N.	108·6	19	—	—	e 25 18	[+14]	e 54·8	66·8
	Z.	108·6	19	e 19 16	?PR_1	—	—	—	66·9
Bidston		108·6	12	26 16	?S	(26 16)	−59	—	69·0
Stonyhurst		109·1	12	5 45	?	—	—	—	64·2
Toronto		109·1	320	19 34	?PR_1	25 7	[0]	32·0	—
Ottawa		109·2	323	e 19 15	?PR_1	e 26 45	−36	62·8	—
Chicago		110·8	313	10 0	?	20 12	?PR_1	e 55·8	—
Ekaterinburg		129·7	44	19 14	[− 3]	23 37	?PR_1	62·8	—
Victoria	N.	132·7	298	—	—	—	—	67·1	69·8

Additional readings: Adelaide gives also e = +26m.45s., i = +41m.9s. Riverview MN = +56·1m. San Fernando MN = +55·2m. Bidston P = +28m.50s., S = +35m.15s. Toronto SE = +25m.8s. Ottawa eL = +34·8m. Chicago L = +71·8m. Ekaterinburg L = +24·8m. and +38·8m. Eskdalemuir (Δ = 110°·5) gives simply from 2h.0m. to 2h.50m. Victoria LE = +73·7m.

June 2d. 12h. 39m. 30s. (I) } Epicentre 30°·2S. 179°·0W. (as on 1920 Mar. 11d.).
14h. 18m. 35s. (II) }

A = −·864, B = −·015, C = −·503; D = −·018, E = +1·000; G = +·503, H = +·009, K = −·864.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Apia	17·7	24	—	—	—	—	e 6·5	—
II	17·7	24	e 1 25	?	—	—	—	4·4
I Riverview	25·5	254	e 5 40	− 3	e 10 6	− 7	e 11·7	14·2
II	25·5	254	e 5 37	− 6	—	—	e 14·7	19·0
I Sydney	25·5	254	9 12	?S	(9 12)	−61	13·0	14·5
II	25·5	254	10 55	?S	(10 55)	+42	15·9	17·1
I Adelaide	35·8	252	—	—	e 13 0	− 7	e 17·5	21·5
II	35·8	252	—	—	e 13 7	0	e 17·4	24·9
II Honolulu E.	55·4	25	—	—	i 16 48	−38	—	16·9
II N.	55·4	25	—	—	16 59	−27	—	21·2
I Zi-ka-wei	83·4	313	e 12 42	+ 4	—	—	—	38·5
II	83·4	313	—	—	e 21 9	−112	—	—
I Colombo	103·1	271	58 42	?L	—	—	(58·7)	65·5
I Toronto E.	116·8	51	—	—	—	—	59·2	—
I Ottawa	119·8	50	—	—	—	—	e 59·5	—
II	119·8	50	—	—	e 25 7	[−27]	55·9	—
I Ekaterinburg	131·3	321	—	—	e 38 5	?SR_1	51·5	—
I De Bilt	157·9	353	e 20 19	[+13]	—	—	e 75·5	—
II	157·9	353	e 18 51	[−75]	—	—	e 71·4	—
I Uccle	159·2	354	—	—	—	—	e 80·5	—
I Strasbourg	160·9	346	e 20 30	[+21]	—	—	e 80·5	—
II	160·9	346	e 18 25	[−104]	—	—	e 78·4	—

Additional readings and notes: Apia readings for both shocks have been diminished by 1h. Riverview gives also for I MZ = +13·5m., MN = +15·8m., T_o = 12h.39m.30s., II MN = +18·3m. Adelaide I e = +20m.0s., II e = +21m.55s. Toronto I LE = +67·0m. Ottawa I L = +64·0m., II e = +35m.25s.

June 2d. Readings also at 0h. (Zagreb, near Osaka, Kobe, Mizusawa, and Nagoya), 1h. (near Mizusawa (2), and near Osaka), 2h. (Zagreb, Mizusawa (2), and near Athens and Rocca di Papa), 3h. (near Mizusawa and Osaka, La Paz, and Ekaterinburg), 4h. (Riverview, Nagasaki, Strasbourg, and De Bilt), 5h. (Zi-ka-wei and Ottawa), 6h. (La Paz), 7h. (Nagoya, Mizusawa, and Osaka), 22h. (Ekaterinburg and La Paz), 23h. (La Paz, Toronto, and Ottawa).

June 3d. 11h. 33m. 15s. Epicentre 56°·0S. 10°·0W.

A = +·551, B = −·097, C = −·829; D = −·174, E = −·985;
G = −·817, H = +·144, K = −·559.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Cape Town		29·5	53	12 45	?SR_1	—	—	—	18·2
Rio de Janeiro	E.	41·1	310	e 8 1	− 3	14 18	− 4	19·9	21·2
	N.	41·1	310	i 8 4	0	14 22	0	19·6	20·2
La Paz		58·8	288	10 8	+ 4	i 18 10	+ 1	28·5	30·8
Riverview		88·8	166	—	—	e 23 51	−10	e 45·6	50·2
Colombo		95·6	86	51 15	?L	—	—	(51·2)	53·8
Coimbra		96·2	1	—	—	e 24 15	−63	e 45·1	—
Tortosa	N.	97·2	8	—	—	—	—	e 48·8	58·2
Paris		105·3	9	—	—	e 36 45	?	55·8	60·8
Strasbourg		105·6	13	e 22 45	?PR_1	—	—	—	58·8
Uccle		106·9	10	—	—	e 29 9	?	e 47·8	—
De Bilt		108·8	10	—	—	—	—	e 50·8	52·0
Eskdalemuir	Z.	111·4	4	e 16 45	+101	—	—	—	—
Edinburgh		112·0	4	—	—	e 35 45	?SR_1	—	—
Ottawa		115·4	315	—	—	—	—	e 49·8	—
Toronto	E.	115·5	311	—	—	—	—	e 61·5	—
Ekaterinburg		126·3	39	19 38	[+29]	—	—	56·8	77·2

Additional readings and notes: Riverview gives also e = +35m.45s., MN = +48·7m. Coimbra e = +32m.35s. (?SR_1). De Bilt MNZ = +61·4m. Ottawa L = +57·2m. Ekaterinburg MN = +76·6m.

June 3d. Readings also at 0h. (De Bilt and Ekaterinburg), 2h. (Mizusawa), 3h. (Nagoya, Zi-ka-wei, near Osaka, Kobe, and near Mizusawa), 4h. (Zi-ka-wei, La Paz (3), Ekaterinburg (2), and near Rocca di Papa), 9h. (Ekaterinburg), 11h. (near Osaka and near Mostar and Belgrade), 13h. (Ekaterinburg), 14h. (Ekaterinburg), 16h. (La Paz), 21h. (Colombo).

June 4d. 4h. 39m. 50s. (I) / 18h. 52m. 20s. (II) } Epicentre 36°·0N. 142°·0E. (as on June 2d.)

A = −·638, B = +·498, C = +·588; D = +·616, E = +·788;
G = −·463, H = +·362, K = −·809.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Mizusawa	N.	3·2	348	1 0	+10	1 21	− 7	—	—
II	E.	3·2	348	0 54	+14	1 31	+ 3	—	—
II	N.	3·2	348	0 55	+ 5	1 29	+ 1	—	—
II Nagoya		4·2	260	1 6	+ 1	—	—	—	—
II		4·2	260	1 2	− 3	—	—	—	—
I Osaka		5·5	258	1 32	+ 7	—	—	2·7	3·0
II		5·5	258	1 35	+10	—	—	2·8	3·5
I Kobe		5·8	259	2 24	?S	(2 24)	−15	2·9	3·2
II		5·8	259	e 1 25	− 5	—	—	2·7	3·1
I Hakodate		5·9	351	1 32	+ 1	—	—	—	—
II		5·9	351	1 37	+ 6	—	—	—	—

Additional readings: Mizusawa I SE = +1m.23s. Osaka I MN = +3·2m., II MN = +3·0m. Kobe II MN = +3·3m.

June 4d. 20h. 33m. 0s. Epicentre 35°·5N. 25°·5E.

A = +·734, B = +·351, C = +·581; D = +·431, E = −·903; G = +·524, H = +·250, K = −·814.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	2·8	331	0 57	+13	1 36	+19	1·8	2·2
Belgrade	10·1	339	e 3 28	+57	e 5 32	+60	—	6·8
Pompeii	10·1	305	4 58	?S	(4 58)	+26	(5·6)	—
Rocca di Papa	11·8	306	e 3 18	+22	e 5 12	− 2	—	5·2
Zagreb	12·6	328	e 2 58	− 9	e 5 11	−23	e 8·4	9·1
Florence	13·7	312	3 30	+ 8	—	—	—	—
Vienna	14·4	335	e 3 31	− 1	i 6 18	0	e 8·3	11·2
Moncalieri	16·5	310	4 27	+28	7 18	+11	9·6	12·8
Strasbourg	18·5	320	e 4 18	− 5	—	—	—	13·0
Hamburg	21·1	334	e 4 48	− 6	—	—	—	—
Paris	21·5	315	e 4 53	− 6	—	—	12·0	—
Uccle	21·6	322	e 4 54	− 6	e 8 48	− 9	e 11·0	—
De Bilt	22·0	325	—	—	8 56	− 9	e 12·0	13·9
Granada	23·4	283	i 4 42	−39	—	—	—	—
Upsala	24·9	351	—	—	—	—	e 15·0	—
Rio Tinto	25·8	285	20 0	?	—	—	—	21·0
Edinburgh	28·3	324	—	—	e 11 0	− 4	—	18·0
Ekaterinburg	31·8	37	6 45	0	11 58	− 7	18·0	—
Ottawa	72·5	314	—	—	—	—	e 47·0	—
Toronto	75·6	314	—	—	—	—	50·1	—
Victoria N.	91·3	340	—	—	—	—	81·2	81·8
La Paz	102·4	258	e 41 54	?L	—	—	(e 41·9)	—
Honolulu	123·1	4	—	—	—	—	i 70·0	—

Additional readings and notes: Athens gives also iPN = +1m.1s., PE = +1m.5s. MN = +2·5m. Rocca di Papa eE = +3m.48s., eN = +4m.0s. Zagreb gives also seven other e's. De Bilt MN = +13·7m. Granada i = +4m.0s. and +5m.8s. Ekaterinburg readings have been diminished by 30m. Ottawa eL = +67·0m., L = +78·0m. Toronto L = +59·9m. Victoria LE = +82·4m. Honolulu eN = +70m.50s.

June 4d. Readings also at 0h. (Ekaterinburg, Kobe, and near Osaka and Mizusawa), 1h. (near Belgrade), 4h. (Tiflis), 7h. (Nagoya, Osaka, and near Mizusawa), 9h. (Algiers), 11h. (Ekaterinburg, Nagoya, near Osaka, and Mizusawa), 12h. (near Osaka and Mizusawa), 13h. (Apia), 14h. (Florence), 16h. (Zagreb), 17h. (Colombo), 19h. (La Paz and near Osaka, Kobe, and Mizusawa), 20h. (Rio Tinto), 21h. (Rio Tinto, Ekaterinburg, and Strasbourg), 22h. (Paris), 23h. (Nagasaki, Nagoya, and near Osaka and Mizusawa).

June 5d. 2h. 7m. 4s. Epicentre 36°·0N. 142°·0E. (as on June 4d.).

A = −·638, B = +·498, C = +·588.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa E.	3·2	348	0 47	− 3	1 28	0	—	—
N.	3·2	348	0 45	− 5	1 26	− 2	—	—
Nagoya	4·2	260	1 6	+ 1	—	—	2·2	—
Osaka	5·5	258	1 27	+ 2	(2 40)	+ 9	2·7	3·0
Kobe	5·8	259	e 1 27	− 3	(2 45)	+ 6	2·8	3·0
Hakodate	5·9	351	1 34	+ 3	(2 28)	−13	2·5	4·0
Sapporo	7·1	355	2 49	?S	(2 49)	−24	3·7	—
De Bilt	84·2	337	—	—	—	—	e 49·9	—
Strasbourg	86·2	333	—	—	—	—	e 47·9	—
Paris	87·9	336	—	—	—	—	e 54·9	—

Additional readings: Hakodate MN = +3·5m. Osaka MN = +3·1m.

June 5d. Readings also at 1h. (Ekaterinburg), 3h. (near Batavia and Malabar), 6h. (Victoria, Toronto, Chicago, Ottawa, and Honolulu), 16h. (Toledo), 18h. (Zi-ka-wei), 22h. (Rocca di Papa).

June 6d. 17h. 36m. 30s. Epicentre 36°·0N. 142°·0E. (as on June 5d.).

$A = -\cdot638$, $B = +\cdot498$, $C = +\cdot588$; $D = +\cdot616$, $E = +\cdot788$; $G = -\cdot463$, $H = +\cdot362$, $K = -\cdot809$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	3·2	348	0 51	+ 1	1 25	− 3	—	—
Nagoya		4·2	260	0 55	−10	—	—	2·1	3·1
Osaka		5·5	258	1 39	+14	—	—	2·8	4·3
Kobe		5·8	259	1 20	−10	2 39	0	3·6	4·2
Hakodate		5·9	351	1 42	+11	—	—	3·1	4·8
Sapporo		7·1	355	2 23	+35	—	—	3·8	—
Nagasaki		10·6	256	e 2 44	+ 6	—	—	e 6·1	—
Ootomari		10·7	3	e 3 20	+40	—	—	—	—
Zi-ka-wei		17·8	260	e 4 3	−12	e 6 49	−47	—	11·6
Taihoku		20·7	244	—	—	e 8 20	−18	—	—
Hong Kong		27·9	248	—	—	—	—	—	18·0
Manila		28·5	227	—	—	e 8 30	+158	—	—
Honolulu	E.	53·7	89	—	—	—	—	e 24·1	—
Ekaterinburg		56·1	321	9 41	− 6	17 32	− 3	26·5	36·8
Colombo		63·5	261	19 0	?S	(19 0)	− 7	—	44·5
Victoria		66·7	47	6 35	?	(19 47)	+ 1	19·8	—
Hamburg		81·3	335	—	—	e 22 30	− 8	e 43·5	50·1
Vienna	Z.	82·9	329	e 12 27	− 8	—	—	—	55·5
Edinburgh		83·5	343	—	—	e 23 0	− 3	—	55·5
De Bilt		84·2	337	—	—	23 0	−10	e 44·5	52·9
Zagreb		84·9	327	—	—	—	—	39·5	47·1
Uccle		85·6	336	—	—	—	—	e 45·5	—
Bidston		85·6	341	14 32	+101	23 6	−20	—	59·5
Innsbruck		85·8	330	—	—	—	—	e 49·5	—
Strasbourg		86·2	333	e 12 45	− 9	e 23 30	− 2	—	53·5
Paris		87·9	336	e 12 55	− 9	—	—	50·5	58·5
Florence		88·6	329	—	—	—	—	52·5	—
Moncalieri		89·1	331	e 12 34	−37	22 50	[−33]	48·8	53·9
Rocca di Papa		89·5	326	—	—	—	—	e 48·4	60·9
Ottawa		91·8	26	—	—	e 24 4	−29	e 39·5	—
Toronto	N.	91·9	30	—	—	(24 11)	+23	47·1	—
Tortosa	E.	95·5	333	—	—	—	—	53·5	63·0
	N.	95·5	333	—	—	—	—	e 52·5	61·3
Georgetown	E.	96·8	30	—	—	e 23 30	[−37]	—	—
Algiers		97·8	329	—	—	—	—	e 54·5	61·0
Toledo		98·0	336	—	—	—	—	e 52·5	—
Coimbra	N.	99·0	340	e 20 20	?PR_1	33 50	?SR_1	53·8	—
Rio Tinto		100·7	337	56 30	?L	—	—	(56·5)	63·5
San Fernando	N.	101·8	336	54 54	?L	—	—	66·5	68·0
La Paz		146·9	62	e 19 45	[− 6]	—	—	—	—

Additional readings and notes: Osaka gives also MN = +3·5m. Kobe MN = +4·3m., S has been increased by 9m. Hakodate MN = +3·9m. Sapporo readings are given for 5d. Zi-ka-wei MN = +11·5m. Honolulu eN = +24m.30s. Ekaterinburg iP = +9m.42s., MN = +37·6m. Hamburg MNZ = +53·5m. De Bilt MN = +55·4m., MZ = +59·7m. Florence reading has been diminished by 1h. Ottawa e = +30m.30s., L = +52·5m. Toronto gives S as L; also L = +58·7m. Coimbra eE = +20m.50s. and +30m.50s. Toledo reading has been increased by 1h.

June 6d. 19h. 25m. 36s. Epicentre 65°·0N. 28°·0E.

$A = +\cdot373$, $B = +\cdot198$, $C = +\cdot906$; $D = +\cdot469$, $E = -\cdot883$; $G = +\cdot800$, $H = +\cdot425$, $K = -\cdot423$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Ekaterinburg		17·6	101	4 10	− 2	i 7 36	+ 5
Vienna	Z.	17·9	206	4 53	+37	i 5 27	?
Strasbourg		19·6	223	i 4 57	+21	—	—
Zagreb		20·3	205	e 4 43	− 2	—	—
Paris		21·0	232	e 4 57	+ 4	e 8 44	0

No other readings.

June 6d. Readings also at 1h. (Chicago), 2h. (Ekaterinburg, La Paz, and near Zurich), 12h. and 13h. (Paris), 17h. (near Granada), 19h. (Adelaide), 20h. (Uccle, Chicago, Ekaterinburg, Paris, and De Bilt), 21h. (near Zagreb), 22h. (Victoria and Zagreb), 23h. (De Bilt, Paris, Ekaterinburg, Chicago, Washington, Ann Arbor, Toronto, Ottawa, Georgetown, Strasbourg, and Bidston).

June 7d. Readings at 3h. (La Paz), 7h. (near Osaka and Kobe), 12h. (Rocca di Papa), 14h. (Nagasaki), 16h. (near Batavia and Malabar), 18h. (La Paz, Nagoya, and near Osaka), 21h. (near Osaka), 23h. (Victoria, Eskdalemuir, Nagasaki, and near Hakodate).

June 8d. Readings at 6h. (La Paz), 8h. (Ottawa), 13h. (Toledo), 14h. (Coimbra), 15h. (Rocca di Papa and near Zagreb, Mostar, and Sarajevo), 17h. (near La Paz), 18h. (Algiers), 19h. (Cape Town), 22h. (Algiers).

June 9d. Readings at 8h. (near Mizusawa), 9h. (near Athens), 15h. (Lisbon), 17h. (Rio Tinto).

June 10d. Readings at 1h. (Port au Prince, Porto Rico, Ottawa, Toronto, and Nagoya), 5h. (Lisbon), 6h. (near Athens), 7h. (near Kobe), 10h. (Manila, and Rocca di Papa), 11h. (Sinj (2)). 13h. (Nagoya and near Mizusawa, near Batavia, and Malabar), 19h. (Ottawa and Toronto), 20h. (Ottawa).

June 11d. Readings at 4h. (Apia), 6h. (Nagoya and near Osaka and Kobe), 11h. (La Paz, Paris, Ottawa, Toronto, and Strasbourg), 22h. (Kodai-kanal), 23h. (Ootomari and near Sapporo).

June 12d. 16h. 49m. 35s. Epicentre 36°·0N. 142°·0E. (as on June 6d.).

A = −·638, B = +·498, C = +·588.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	3·2	348	0 55	+ 5	1 46	+18	—	—
	N.	3·2	348	0 54	+ 4	1 47	+19	—	—
Nagoya		4·2	260	1 1	− 4	—	—	1·5	1·9
Osaka		5·5	258	1 23	− 2	(2 29)	− 2	2·5	3·2
Kobe		5·8	259	1 41	+11	(2 30)	− 9	2·5	2·7

Additional readings: Osaka MN = +3·8m. Kobe MN = +2·8m.

June 12d. Readings also at 0h. (Strasbourg), 1h. (Manila and Algiers), 3h. (Algiers), 6h. (Ottawa), 10h. (Apia), 15h. (near Zi-ka-wei), 16h. (Moncalieri), 17h. (Nagoya and near Osaka).

June 13d. 11h. 31m. 56s. Epicentre 41°·5N. 143°·0E.

A = −·598, B = +·451, C = +·663.

		Δ	P.	O−C.	S.	O−C.	L.	M.
		°	m. s.	s.	m. s.	s.	m.	m.
Hakodate		1·7	0 24	− 2	(0 40)	− 8	0·7	0·8
Sapporo		2·0	0 33	+ 2	(0 50)	− 5	0·8	—
Mizusawa	E.	2·8	0 45	+ 1	1 19	+ 2	—	—

Mizusawa gives also SN = +1m.22s.

June 13d. Readings also at 0h. (La Paz), 5h. (Colombo), 17h. (La Paz), 18h. (Zi-ka-wei), 19h. (Nagasaki), 23h. (La Paz).

June 14d. Readings at 6h. (Rio de Janeiro, La Paz, Chicago, and Ottawa), 7h. (Nagasaki, Batavia, and near Malabar), 8h. (Stonyhurst), 9h. (Rocca di Papa and Pompeii), 15h. (near La Paz), 16h. (Algiers and near Taihoku), 23h. (Lick).

June 15d. 11h. 8m. 50s. Epicentre 36°·0N. 142°·0E. (as on June 12d.).

A = −·638, B = +·498, C = +·588.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	3·2	348	1 1	+11	1 34	+ 6	—	—
Nagoya	4·2	260	1 2	− 3	—	—	—	—
Osaka	5·5	258	1 14	−11	—	—	3·1	4·2
Hakodate	5·9	351	1 36	+ 5	(2 47)	+ 6	2·8	3·0
Zi-ka-wei	17·8	260	—	—	7 42	+ 6	—	12·5

Additional readings: Mizusawa SN = +1m.33s. Osaka MN = +3·7m.

June 15d. Readings also at 1h. (near Granada), 2h. (near Nagasaki), 3h. (Zi-ka-wei), 6h. (near Zagreb), 10h. (Zi-ka-wei and Apia), 13h. and 14h. (La Paz), 19h. (Zagreb, Uccle, De Bilt, Strasbourg, and near Athens), 20h. (Paris, Strasbourg, De Bilt, Oxford, and Edinburgh).

June 16d. 13h. 5m. 30s. Epicentre 36°·0N. 142°·0E. (as on June 15d.).

A = −·638, B = +·498, C = +·588.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	3·2	348	0 58	+ 8	1 50	+22	—	—
	N.	3·2	348	0 57	+ 7	1 51	+23	—	—
Nagoya		4·2	260	2 33	?S	(2 33)	+38	—	—
Osaka		5·5	258	1 56	+31	(3 7)	+36	3·1	3·6
Kobe		5·8	259	e 2 31	+61	(2 54)	+15	3·2	4·4
Hakodate		5·9	351	1 2	−29	—	—	2·3	—
Zi-ka-wei		17·8	260	e 5 4	+49	—	—	—	—
Ekaterinburg		56·1	321	9 56	+ 9	—	—	28·5	—

Kobe gives also MN = +4·6m.

June 16d. Readings also at 2h. (De Bilt and Strasbourg), 6h. (Rio de Janeiro), 9h. (Cape Town and Strasbourg), 10h. (Cape Town), 11h. (Manila, Strasbourg, Zi-ka-wei, and Ekaterinburg), 15h. (La Paz), 17h. (2) and 20h. (Lick), 21h. (Pompeii, Zi-ka-wei, and La Paz), 22h. (Ekaterinburg), 23h. (Zi-ka-wei).

June 17d. 18h. 2m. 54s. Epicentre 68°·5N. 19°·5W.

A = +·345, B = −·122, C = +·930; D = −·334, E = −·943;
G = +·877, H = −·311, K = −·367.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Edinburgh	14·6	141	—	—	—	—	7·6	9·6
Eskdalemuir	15·1	142	—	—	—	—	e 7·2	—
Bidston	16·9	144	2 18	?	—	—	—	—
Oxford	18·9	143	—	—	—	—	—	13·1
Kew	19·4	142	—	—	—	—	—	12·1
De Bilt	20·2	132	i 4 40	− 3	e 8 21	− 6	e 10·5	12·6
Hamburg	20·3	122	e 4 6	−39	—	—	—	—
Uccle	21·1	135	—	—	—	—	e 11·1	—
Paris	22·5	140	e 5 11	0	e 9 16	+ 1	13·1	14·1
Pulkovo	22·6	88	e 5 13	+ 1	(8 54)	−23	8·9	—
Strasbourg	24·0	132	—	—	—	—	e 13·1	—
Coimbra	28·9	162	—	—	—	—	e 15·1	—
Ekaterinburg	35·6	68	—	—	(12 6)	−58	12·1	20·5

Additional readings: De Bilt gives also MN = +12·5m., MZ = +15·3m. Ekaterinburg MZ = +20·2m.

June 17d. Readings also at 0h. (Manila, Ekaterinburg (2), and Zi-ka-wei), 1h. (La Paz), 3h. (La Paz and Colombo), 5h. and 6h. (Colombo), 16h. (Strasbourg), 17h. (Simla), 21h. (Riverview and near Athens), 22h. (Colombo, Ekaterinburg, and Riverview).

June 18d. 4h. 18m. 40s. Epicentre 34°·8N. 46°·0E.

$A = +\cdot570$, $B = +\cdot591$, $C = +\cdot571$; $D = +\cdot719$, $E = -\cdot695$; $G = +\cdot396$, $H = +\cdot411$, $K = -\cdot821$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis	E.	6·9	352	e 1 42	− 3	e 3 13	+ 6	—	—
	N.	6·9	352	e 1 55	+10	e 3 50	+43	e 4·4	—
Ekaterinburg		24·1	20	i 5 29	0	9 48	+ 2	13·3	17·8
Pulkovo		27·0	343	i 6 0	+ 2	10 31	−10	13·3	—

No additional readings.

1923. June 18d. 8h. 15m. 45s. Epicentre 18°·5S. 176°·0W.

$A = -\cdot946$, $B = -\cdot066$, $C = -\cdot317$; $D = -\cdot070$, $E = +\cdot998$; $G = +\cdot317$, $H = +\cdot022$, $K = -\cdot948$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		6·2	42	i 1 34	− 1	e 2 49	0	—	—
Wellington		24·1	197	i 5 29	0	9 57	+11	i 12·4	18·2
Riverview		33·0	235	i 6 53	− 3	i 12 20	− 4	e 16·0	20·9
Sydney		33·0	235	6 51	− 5	13 9	+45	16·6	18·0
Adelaide		43·4	238	i 8 33	+12	e 14 27	−27	e 19·0	23·2
Honolulu	E.	43·5	25	8 22	0	14 17	−38	—	17·8
	N.	43·5	25	8 18	− 4	i 14 28	−27	e 19·7	27·8
Perth		62·2	243	1 5	?	—	—	—	—
Nagoya		69·8	322	11 49	+33	—	—	—	—
Mizusawa	N.	70·2	327	11 22	+ 4	(20 26)	− 2	20·4	—
Manila		70·3	294	e 11 40	+21	—	—	—	—
Osaka		70·4	320	11 38	+19	(20 39)	+ 8	20·6	22·0
Kobe		70·6	320	e 11 27	+ 6	—	—	12·8	21·6
Hakodate		72·3	329	11 37	+ 5	—	—	—	12·4
Sapporo		73·0	330	11 39	+ 3	—	—	—	—
Taihoku		74·7	305	e 11 30	−17	—	—	—	—
Malabar		74·8	269	i 12 0	+12	i 21 35	+11	—	—
Batavia		75·8	270	i 12 2	+ 8	i 21 47	+12	—	—
Zi-ka-wei		77·9	311	e 12 9	+ 3	e 21 47	−12	—	—
Hong Kong		79·5	298	12 18	+ 2	(22 22)	+ 4	22·4	23·9
Tucson	E.	80·3	51	12 19	− 2	22 7	−20	39·7	—
Victoria	E.	81·7	33	12 28	− 1	(22 22)	−21	22·4	22·8
Sitka	E.	82·8	22	12 36	+ 1	22 34	−21	34·9	—
	N.	82·8	22	—	—	22 27	−28	34·6	—
La Paz		100·9	112	14 10	− 5	i 24 34	[+ 6]	46·6	49·6
Chicago		101·0	50	14 33	+18	i 24 21	[− 8]	44·2	—
Calcutta	E.	102·0	291	17 22	?	—	—	—	—
Ann Arbor		104·0	50	—	—	i 25 15	[+32]	55·2	—
Colombo		105·6	272	—	—	25 57	−51	28·9	29·8
Toronto	E.	107·3	48	18 56	?PR_1	24 51	[− 7]	e 50·5	—
	N.	107·3	48	19 14	?PR_1	24 59	[+ 1]	44·3	—
Georgetown	E.	108·3	53	e 18 27	?PR_1	i 24 59	[− 4]	55·5	59·5
	N.	108·3	53	e 18 21	?PR_1	e 24 59	[− 4]	47·9	—
Washington		108·3	53	14 26	−24	24 26	[−37]	47·8	—
Kodaikanal		108·8	274	21 27	?PR_1	(29 39)	+142	29·6	30·6
Ithaca		109·2	50	—	—	i 25 57	[+50]	56·2	—
Ottawa		110·1	46	18 38	?PR_1	25 3	[− 7]	50·2	—
Northfield		112·2	47	e 24 15	?	—	—	—	—
Rio de Janeiro	E.	118·1	129	e 19 52	?PR_1	25 42	[+ 2]	29·9	30·0
	N.	118·1	129	e 19 38	?PR_1	25 45	[+ 5]	29·9	36·8
Ekaterinburg		123·4	326	15 49	−10	i 28 52	−23	50·2	57·6
Cape Town		125·8	193	—	—	—	—	—	38·5
Pulkovo		134·6	340	19 18	[−11]	32 45	?	54·2	65·0
Upsala		137·5	350	e 22 18	?PR_1	—	—	—	69·1
Edinburgh		142·2	6	e 20 15	[+32]	i 40 55	?SR_1	—	—
Eskdalemuir		142·8	6	19 34	[−11]	—	—	42·2	—
Stonyhurst		144·3	5	e 20 15	[+28]	—	—	—	82·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hamburg		144·6	354	e 19 51	[+ 3]	—	—	e 60·2	61·2
Bidston		144·6	5	19 41	[− 7]	25 42	?	—	78·3
Lemberg		144·8	337	e 19 15	[−33]	—	—	—	—
West Bromwich		145·6	6	19 45	[− 4]	—	—	—	—
De Bilt		146·4	357	i 19 47	[− 3]	—	—	e 61·7	90·0
Oxford		146·4	6	i 19 49	[− 1]	—	—	—	—
Kew		146·9	5	—	—	—	—	—	92·2
Uccle		147·7	358	e 19 50	[− 2]	—	—	i 42·2	87·4
Vienna		148·6	344	19 51	[− 3]	28 6	?	42·4	73·2
Paris		149·6	2	e 19 56	[+ 1]	—	—	47·2	84·2
Strasbourg		149·8	355	19 55	[− 1]	e 29 10	?	e 42·2	81·6
Belgrade		150·3	336	e 19 51	[− 5]	e 27 1	?	e 50·7	—
Zagreb		150·9	343	e 20 1	[+ 4]	—	—	e 56·2	75·0
Zurich		150·9	354	19 58	[+ 1]	—	—	—	—
Besançon		151·2	357	20 6	[+ 9]	—	—	—	44·2
Puy de Dôme		152·6	2	19 59	[− 1]	e 29 15?	?	—	—
Helwan		152·7	300	e 19 59	[− 1]	—	—	—	34·4
Moncalieri		153·3	354	19 54	[− 6]	29 9	?	61·6	97·8
Athens		154·0	323	e 20 10	[+ 9]	e 29 59	?	e 45·2	54·4
Florence		154·0	348	20 14	[+13]	—	—	—	20·9
Rocca di Papa		155·6	344	e 20 4	[+ 1]	24 15	?PR_1	—	—
Coimbra	E.	155·8	24	19 9	[−54]	32 21	?	57·8	84·2
	N.	155·8	24	20 9	[+ 6]	30 39	?	60·8	—
Pompeii		155·9	340	e 20 15	[+12]	e 25 15	?PR_1	74·2	—
Barcelona		157·0	4	e 20 12	[+ 7]	—	—	e 43·5	51·5
Tortosa	E.	157·5	7	20 16	[+10]	—	—	57·3	92·8
Toledo		157·5	16	20 8	[+ 2]	31 4	?	e 43·3	88·2
Rio Tinto		158·6	24	23 15	?PR_1	—	—	—	47·8
San Fernando	N.	159·9	25	20 15	[+ 7]	29 39	?	42·2	87·2
Granada		160·4	18	i 20 12	[+ 4]	29 1	?	50·8	—
Algiers		161·7	3	—	—	—	—	—	81·2

Additional readings and notes: Wellington gives also P = +5m.57s., iS = +9m.44s., T_0 = 8h.15m.47s. Riverview i = +7m.4s., PR_1 = +8m.20s., +8m.36s., and +9m.20s., eS = +13m.16s., PS = +13m.42s., i = +15m.19s., and +17m.19s., MN = +17·8m., MZ = +18·3m., T_0 = 8h.14m.33s. Sydney PR_2 = +9m.15s., L = +20·0m. and +23·2m. Adelaide PR_1 = +10m.15s. Honolulu PR_1N = +9m.41s., iPSE = +15m.15s., iPSN = +15m.22s., iSR_1E = +17m.42s., iSR_1N = +17m.37s., T_0 = 8h.16m.30s. Mizusawa PE = +11m.25s. Osaka MN = +24·1m. Kobe MN = +14·2m. Batavia i = +13m.3s. Tucson PN = +12m.23s., eE = +12m.54s., +22m.27s., and +25m.33s. Victoria S = +16m.48s. Sitka PSE = +23m.40s., T_0 = 8h.16m.28s. La Paz PR_1 = +18m.24s., SR_1 = +29m.59s. Chicago PR_1 = +18m.39s., SR_1 = +32m.7s., eL = +41·9m. Ann Arbor i = +24m.33s., eL = +37·2m., L = +46·2m. Calcutta PN = +17m.38s. Toronto gives PE? = +19m.23s. and several other i readings. Georgetown iE = +25m.53s., iN = +26m.26s., eLE = +33·2m. Washington eL = +44·2m. Ithaca e = +24m.45s. and +33m.15s., L = +48·2m. Ottawa e = +15m.15s., i = +25m.56s., SR_2 = +28m.30s. Ekaterinburg i = +19m.9s., +20m.44s., +23m.10s., and +29m.52s., MZ = +66·4m. Pulkovo i = +23m.0s. (?iPR_1). Edinburgh i = +41m.59s. Eskdalemuir iZ = +20m.21s., eN = +22m.44s. Hamburg MN = +73·2m. De Bilt eZ = +20m.35s., eE = +41m.57s., and +47m.24s., MN = +86·7m., MZ = +86·5m. Uccle i = +20m.35s., PR_1 = +23m.33s. Vienna iZ = +19m.55s., iN = +21m.42s., iE = +22m.47s., iN = +33m.51s., MZ = +82·2m. Paris e = +30m.55s. and +33m.53s., MN = +87·2m. Strasbourg PE = +20m.0s., MN = +91·4m. Belgrade PR_1 = +20m.12s., +20m.59s., and +21m.17s. Zagreb ePR_1 = +20m.28s., e = +35m.15s., and +42m.39s. Moncalieri MN = +92·1m. Athens PR_1E = +26m.17s., LE = +31·4m. Rocca di Papa ePZ = +19m.45s., iPZ = +20m.5s., iSZ = +24m.10s. Tortosa PN = +20m.15s. Granada PR_1 = +24m.39s., SR_1 = +33m.1s.

June 18d. 11h. 28m. 10s. Epicentre 36°·0N. 142°·0E. (as on June 16d.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	3·2	348	0 46	− 4	1 18	−10	—	—
Nagoya		4·2	260	1 16	+11	—	—	2·4	2·8
Osaka		5·5	258	1 29	+ 4	(2 40)	+ 9	2·7	3·6
Kobe		5·8	259	1 26	− 4	(2 45)	+ 6	2·7	3·2
Hakodate		5·9	351	1 28	− 3	(2 39)	− 2	2·6	3·6
Zi-ka-wei		17·8	260	e 4 16	+ 1	—	—	—	—
Ekaterinburg		56·1	321	i 9 33	−14	e 18 36	+61	27·8	35·0
De Bilt		84·2	337	—	—	—	—	e 47·8	—

Additional readings: Mizusawa SN = +1m.19s. Osaka MN = +3·5m. De Bilt eLN = +51·8m.

June 18d. Readings also at 0h. (near Kingston (2) and near Algiers), 2h. (Paris), 5h. (Paris, near Kobe (2), Osaka, and Nagoya), 6h. (San Fernando), 8h. (Wellington), 9h. (La Paz), 10h. (near Athens), 13h. (Strasbourg), 16h. (La Paz), 17h. and 18h. (Ottawa), 21h. (Toronto).

June 19d. 7h. 1m. 10s. Epicentre 36°·0 142°·0E. (as on June 18d.).

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	3·2	2 23	+93	—	—	—	—
Nagoya	4·2	1 0	− 5	—	—	—	—
Osaka	5·5	1 26	+ 1	—	—	2·6	3·3
Kobe	5·8	1 45	+15	—	—	2·4	3·5
Hakodate	5·9	2 36	?S	(2 36)	− 5	—	—

Additional readings: Osaka gives also MN = +3·0m. Kobe MN = +4·4m.
Mizusawa PN = +2m.22s.

June 19d. 22h. 43m. 30s. Epicentre 61°·8N. 151°·0W.

A = −·413, B = −·229, C = +·881; D = −·485, E = +·875; G = −·771, H = −·427, K = −·473.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	E.	9·2	114	2 45	+26	4 51	+43	5·5	7·7
	N.	9·2	114	2 53	+34	4 42	+34	5·3	6·5
Victoria		20·5	118	5 1	+14	—	—	9·3	12·8
Denver		35·4	105	—	—	—	—	17·5	19·5
Honolulu	E.	40·8	189	—	—	14 33	+15	20·2	20·3
	N.	40·8	189	—	—	14 22	+ 4	19·6	24·2
Ann Arbor		43·3	85	8 30	+10	15 0	+ 8	22·5	27·0
Hakodate		44·1	275	8 15	−12	—	—	—	—
Toronto	E.	44·2	80	8 20	− 7	15 0	− 5	—	—
	N.	44·2	80	i 8 21	− 6	14 53	−12	21·9	27·7
Ottawa		44·6	75	8 23	− 7	15 0	−10	e 22·5	24·0
Ithaca		46·5	78	i 8 38	− 6	e 15 30	− 5	23·5	25·5
Northfield		47·0	74	7 0	−107	15 26	−15	e 23·5	25·5
Georgetown	N.	49·0	82	i 9 3	+ 3	16 10	+ 4	e 23·0	26·7
Washington		49·0	82	i 9 2	+ 2	16 9	+ 3	e 24·0	26·5
Cheltenham	E.	49·3	82	—	—	16 16	+ 6	23·2	27·2
	N.	49·3	82	9 2	0	—	—	25·3	26·9
Halifax		50·6	67	8 9	−62	16 9	−17	27·2	31·0
Osaka		52·3	274	9 24	+ 2	—	—	10·5	10·7
Upsala	N.	58·0	6	e 9 57	− 2	—	—	e 33·5	—
Pulkovo		58·4	358	i 10 1	0	18 11	+ 7	23·5	32·2
Ekaterinburg		58·8	340	i 10 6	+ 2	18 7	− 2	26·5	37·4
Edinburgh		59·6	20	—	—	—	—	e 23·5	—
Eskdalemuir		60·2	20	i 10 14	+ 1	e 18 29	+ 3	29·5	—
Zi-ka-wei		61·7	282	e 10 23	0	e 18 37	− 7	—	—
Stonyhurst		61·7	20	e 27 0	?L	—	—	(e 27·0)	42·0
Bidston		62·0	20	19 0	?S	(19 0)	+12	29·2	41·0
Hamburg		63·6	12	i 10 37	+ 1	—	—	e 34·5	—
Kew		64·4	20	—	—	—	—	—	41·5
De Bilt		64·5	15	10 42	0	—	—	e 31·5	43·1
Uccle		65·7	15	e 10 48	− 1	e 19 42	+ 9	32·5	—
Paris		67·4	18	i 11 0	0	—	—	39·5	50·5
Strasbourg		68·3	14	i 11 7	+ 1	—	—	39·5	—
Vienna		69·5	8	i 11 12	− 2	20 23	+ 3	—	—
Innsbruck	N.E.	70·0	12	e 11 16	− 1	—	—	—	—
Moncalieri		71·8	15	11 29	+ 1	21 35	+47	e 35·4	—
Zagreb		71·8	9	e 11 28	0	—	—	—	43·5
Hong Kong		72·6	283	20 58	?S	(20 58)	+ 1	—	44·2
Coimbra	E.	73·6	29	11 44	+ 4	22 18	+69	32·3	—
	N.	73·6	29	11 42	+ 2	e 22 8	+59	—	—
Tortosa	N.	74·8	21	11 48	0	—	—	39·8	53·7
Toledo		74·9	25	12 13	−35	21 34	+ 9	—	—
Rocca di Papa		75·6	11	e 11 49	− 4	—	—	e 48·4	68·0
Manila		76·2	275	e 11 56	0	—	—	—	—
Granada		77·5	26	i 12 3	− 1	22 41	+46	—	—
San Fernando		77·7	28	12 6	+ 1	22 42	+45	—	—
Kodaikanal		98·7	313	52 42	?L	—	—	(52·7)	—
Colombo		101·0	309	35 48	?	—	—	56·0	61·5
La Paz		101·2	103	e 17 35	?PR_1	e 30 55	?SR_1	60·5	65·2

For Notes see next page.

NOTES TO JUNE 19d. 22h. 43m. 30s.

Additional readings and notes: Denver readings have been increased by 1h. Honolulu gives also $SR_1 = +17m.38s.$, $SR_2E = +18m.22s.$, $LN = +21{\cdot}9m.$, $T_0 = 22h.42m.38s.$ Ann Arbor $MN = +26{\cdot}8m.$, $T_0 = 22h.43m.48s.$ Ottawa $PR_1 = +10m.8s.$, $i = +17m.32s.$, $SR_1 = +18m.42s.$, $T_0 = 22h.43m.32s.$ Ithaca $e = +20m.0s.$ Georgetown $ME = +26{\cdot}4m.$ Cheltenham $LE = +25{\cdot}0m.$, $LN = +26{\cdot}0m.$, $T_0 = 22h.43m.27s.$ Pulkovo $PR_1 = +12m.10s.$, $PR_2 = +13m.33s.$, $MN = +40{\cdot}4m.$ Ekaterinburg $PR_1 = +12m.11s.$, $PR_2 = +13m.41s.$ Eskdalemuir $ePR_1?N = +12m.25s.$, $PR_2 = +13m.55s.$, $SR_1 = +22m.46s.$ Bidston $P = +22m.30s.$, all readings increased by 1h. Uccle $e = +13m.12s.$, $SR_1 = +24m.30s.$ De Bilt $ePR_1Z = +13m.3s.$, $MN = +39{\cdot}6m.$, $MZ = +41{\cdot}4m.$ Paris $PR_1 = +13m.25s.$, $MN = +40{\cdot}5m.$ Vienna $SR_2? = +25m.10s.$ Tortosa $ME = +50{\cdot}8m.$

June 19d. Readings also at 2h. (Sinj), 11h. (Zagreb), 14h. (near Taihoku and near Algiers), 15h. (La Paz), 20h. (Algiers and near Osaka and Mizusawa).

June 20d. Readings at 1h. (near Mizusawa), 2h. (near Nagasaki), 4h. (Zi-ka-wei, near Taihoku, and near Mizusawa), 6h. (Ottawa, Sitka, and Victoria), 15h. (Moncalieri and Ekaterinburg), 18h. (La Paz), 19h. (Lick), 21h. (Ekaterinburg), 22h. (Ekaterinburg and near Manila).

June 21d. 12h. 25m. 0s. Epicentre 40°·5N. 82°·5E.

$A = +{\cdot}099$, $B = +{\cdot}754$, $C = +{\cdot}649$; $D = +{\cdot}991$, $E = -{\cdot}131$; $G = +{\cdot}085$, $H = +{\cdot}644$, $K = -{\cdot}760$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Simla	E.	10·3	206	2 24	−10	(e 4 42)	+ 5	e 4·7	4·9
	N.	10·3	206	2 42	+ 8	(e 4 30)	− 7	e 4·5	5·3
Calcutta	E.	18·6	164	8 21	?S	(8 21)	+28	10·7	—
Ekaterinburg		21·6	326	5 0?	0	9 32	+35	12·0?	16·1
Kodaikanal		30·5	191	13 42	?L	—	—	(13·7)	—
Zi-ka-wei		32·6	93	—	—	—	—	e 27·9	—
Pulkovo		37·3	319	7 49	+17	e 15 14	+106	23·0	27·5
Upsala		43·7	320	—	—	—	—	e 25·0	30·5
Vienna		46·4	305	8 34	− 9	—	—	—	30·0
Hamburg		48·9	313	—	—	—	—	e 25·0	32·0
De Bilt		52·1	311	e 9 32	+11	—	—	e 27·0	34·4
Uccle		53·0	310	—	—	—	—	e 30·0	—
Moncalieri		53·1	310	—	—	—	—	e 29·3	—
Paris		54·9	309	—	—	—	—	e 33·0	—
Edinburgh		55·3	317	—	—	—	—	34·0	39·0
Eskdalemuir		55·5	317	—	—	—	—	e 31·0	—

Additional readings and notes: Simla gives also $SE = +3m.30s.$, $SN = +3m.48s.$ Calcutta $PN = +8m.16s.$ Ekaterinburg readings are given roughly. De Bilt $MN = +34{\cdot}2m.$

June 21d. Readings also at 1h. (near Athens), 7h. (Accra), 10h. (La Plata and La Paz), 18h. (near Granada), 20h. (near Athens), 21h. (near Mizusawa), 22h. (La Paz).

June 22d. 3h. 46m. 54s. Epicentre 56°·0N. 136°·0W. (as on 1920 May 8d.).

A = −·402, B = −·389, C = +·829 ; D = −·695, E = +·719 ;
G = −·596, H = −·576, K = −·559.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	E.	1·1	19	—	—	0 35	+ 4	0·7	1·0
	N.	1·1	19	0 16	− 1	0 38	+ 7	0·8	0·9
Victoria		10·8	129	5 45	?S	(5 45)	+55	6·6	7·6
Chicago		33·9	93	13 16	?S	(13 16)	+37	(17·1)	—
Ann Arbor		35·8	90	—	—	e 16 6	+179	20·1	—
Toronto		37·3	84	—	—	e 15 21	+113	e 18·4	—
Ottawa		38·3	79	—	—	e 15 6	+84	e 18·5	—
Ithaca		39·7	84	—	—	—	—	e 19·1	—
Northfield		40·7	79	—	—	—	—	e 19·6	—
Georgetown		41·8	88	—	—	e 15 33	+61	e 20·1	—
Washington		41·8	88	—	—	—	—	e 17·3	—
De Bilt		67·3	25	—	—	—	—	e 35·6	—

Additional readings and notes: Toronto gives also e = +15m.48s. Ottawa L = +21·1m. Georgetown eLN? = +19·8m. The S readings (except Sitka) are only rough.

1923. June 22d. 6h. 44m. 30s. Epicentre 22°·7N. 99°·0E.

A = −·144, B = +·911, C = +·386 ; D = +·988, E = +·156 ;
G = −·060, H = +·381, K = −·923.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	E.	9·8	271	2 3	−24	(4 20)	− 3	4·3	—
	N.	9·8	271	2 8	−19	(4 6)	−17	4·1	—
Hong Kong		14·0	88	3 30	+ 4	7 5	?L	(7·1)	9·0
Hokoto		18·9	83	4 30	+ 2	—	—	e 10·7	11·8
Dehra Dun		20·2	297	4 56	+13	10 9	?L	13·8	19·5
Taihoku		20·7	79	4 46	− 3	8 45	+ 7	11·5	12·6
Simla	E.	21·1	298	4 54	0	8 48	+ 2	e 12·8	14·6
	N.	21·1	298	5 12	+18	8 54	+ 8	e 12·0	13·1
Zi-ka-wei		21·7	62	5 1	0	e 8 54	− 5	—	—
Manila		22·3	107	e 5 11	+ 2	(9 28)	+17	9·5	16·2
Kodaikanal		24·1	242	4 42	−47	(9 36)	−10	9·6	16·7
Bombay		24·7	266	5 25	−10	9 58	+ 1	14·2	15·7
Nagasaki		29·0	63	e 7 59	+101	—	—	e 14·0	19·1
Batavia		29·9	164	6 14	−13	11 18	−13	(16·6)	17·0
Malabar		31·1	164	6 32	− 7	—	—	13·8	—
Kobe		33·7	60	12 14	?S	(12 14)	−22	19·0	21·6
Osaka		33·9	60	7 35	+31	12 38	− 1	16·3	22·0
Nagoya		35·2	60	6 29	−46	—	—	19·4	21·0
Mizusawa	E.	39·3	55	7 42	− 7	13 43	−13	19·8	—
	N.	39·3	55	7 43	− 6	13 44	−12	19·8	—
Hakodate		39·6	52	7 35	−16	—	—	—	—
Sapporo		40·4	49	i 7 56	− 2	14 49	+36	23·8	—
Ootomari		42·4	45	8 10	− 4	—	—	23·0	25·4
Tiflis	E.	48·7	308	9 9	+11	e 16 10	+ 8	e 27·7	37·4
Perth		57·0	164	17 47	?S	(17 47)	+ 1	29·8	31·0
Helwan		60·2	292	i 10 13	0	18 25	− 1	—	42·0
Lemberg		63·3	317	e 10 36	+ 2	e 19 18	+13	e 38·3	42·2
Athens		65·0	304	e 10 44	− 1	19 24	− 1	e 32·5	43·6
Upsala		66·2	329	10 56	+ 3	19 46	+ 6	e 31·5	38·4
Belgrade		66·3	311	e 10 56	+ 2	e 19 37	− 4	e 34·9	41·1
Budapest		66·8	315	e 12 18	+81	e 14 57	?PR_1	e 22·4	—
Vienna		68·4	316	i 11 8	+ 1	20 10	+ 3	e 33·5	39·5
Adelaide		68·8	146	—	—	e 20 12	0	e 33·0	39·5
Zagreb		69·2	314	e 11 13	+ 1	e 20 14	− 2	e 31·9	42·2
Hamburg		71·3	322	i 11 28	+ 3	i 20 49	+ 7	e 38·5	40·1
Pompeii		71·3	309	e 11 25	0	20 30	−12	40·5	52·5
Innsbruck		71·9	317	e 11 31	+ 2	e 20 36	−13	e 37·5	43·5
Rocca di Papa		72·4	310	11 30	− 2	20 48	− 7	e 41·4	54·9
Florence		72·9	313	11 0	−35	20 35	−26	—	43·0
Zurich		73·8	315	e 11 40	− 1	21 14	+ 2	e 29·5	—
Strasbourg		74·0	318	i 11 40	− 2	21 10	− 4	38·0	42·1
De Bilt		74·5	321	11 46	0	21 21	+ 1	e 36·5	42·2
Moncalieri		75·0	314	i 11 48	− 1	21 17	− 9	36·2	47·7
Riverview		75·3	139	e 11 50	− 1	e 21 28	− 1	e 34·4	40·8
Sydney		75·3	139	21 30	?S	21 30	+ 1	44·8	46·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Uccle		75·4	320	e 11 50	− 1	e 21 32	+ 2	e 35·5	45·0
Besançon		75·5	316	11 51?	− 1	21 31	− 1	—	40·5
Paris		77·2	319	i 12 0	− 2	i 21 52	+ 1	39·5	46·5
Marseilles		77·2	314	e 11 58	− 4	21 30	−23	35·5	47·5
Edinburgh		77·8	326	e 12 8	+ 2	i 21 55	− 3	37·5	45·2
Kew		77·9	322	—	—	—	—	—	49·5
Puy de Dôme		78·0	316	12 13	+ 6	—	—	34·5	45·5
Eskdalemuir		78·1	326	—	—	i 22 5	+ 4	36·5	42·5
Stonyhurst		78·2	324	e 12 18	+10	22 6	+ 4	42·0	47·0
West Bromwich		78·5	323	12 8	− 2	i 22 6	0	—	—
Bidston		78·7	324	12 10	− 1	22 10	+ 2	—	44·5
Barcelona		80·0	311	e 12 15	− 4	e 22 19	− 4	e 43·6	46·3
Algiers		81·1	308	12 13	−13	22 22	−14	41·5	55·5
Tortosa	E.	81·4	312	12 22	− 5	22 36	− 3	—	49·8
	N.	81·4	312	12 22	− 5	22 35	− 4	39·6	50·4
Johannesburg		84·2	238	23 36	?S	(23 36)	+26	29·2	—
Toledo		85·0	312	12 41	− 7	23 5	−14	e 42·0	49·0
Granada		85·8	310	i 12 47	− 5	23 20	− 8	e 46·0	50·8
Rio Tinto		87·6	311	10 30	−153	—	—	—	83·0
Coimbra	E.	87·8	315	e 12 20	−44	23 24	−26	44·2	49·2
	N.	87·8	315	12 52	−12	23 44	− 6	—	57·5
San Fernando	N.	88·0	310	13 4	− 1	23 48	− 4	50·5	54·0
Sitka	E.	88·1	27	23 39	?S	(23 39)	−14	38·2	55·3
	N.	88·1	27	24 0	?S	(24 0)	+ 7	49·9	50·8
Honolulu	E.	93·0	66	24 30	?S	(24 30)	−15	37·9	47·5
	N.	93·0	66	24 18	?S	(24 18)	−27	38·2	47·9
Apia		94·6	103	—	—	e 34 57	?	—	35·5
Wellington		94·9	134	—	—	e 24 30	−35	e 48·7	60·5
Cape Town		95·1	235	31 13	?PR_1	—	—	—	51·8
Victoria		99·4	28	17 59	?PR_1	24 37	[+16]	36·4	61·6
Lick		108·8	34	e 32 56	?SR_1	—	—	57·9	—
Ottawa		111·8	356	19 26	?PR_1	27 7	−37	46·5	57·0
Toronto	E.	113·6	359	20 0	?PR_1	27 10	−49	35·5	66·9
	N.	113·6	359	19 35	?PR_1	e 28 0	+ 1	e 35·8	76·0
Ithaca		114·7	357	e 19 30	?PR_1	—	—	57·5	—
Ann Arbor		114·9	2	e 19 30	?PR_1	26 42	−87	e 35·5	—
Chicago		115·2	6	19 51	?PR_1	27 30	−42	35·2	—
Georgetown	N.	118·3	357	e 20 13	?PR_1	e 25 52	[+12]	63·0	—
Washington		118·3	357	20 8	?PR_1	27 14	−82	e 60·5	—
Cheltenham	N.	118·4	357	—	—	e 62 32	?L	73·7	75·8
Rio de Janeiro		145·2	263	i 19 45	[− 3]	42 0	?SR_1	60·5	85·6
Cipolletti		160·4	211	42 54	?SR_1	—	—	88·0	97·1
La Paz		166·4	295	20 21	[+ 9]	34 36	?	74·5	86·4

Additional readings and notes: Dehra Dun readings have been increased by 7m. Manila gives also MN = +15·6m. Nagasaki MN = +16·7m. Batavia i = +7m.49s., iN = +8m.58s., i = +10m.23s., iN = +12m.26s., L is given as S. Malabar iS = +18m.23s. and i = +19m.15s. Kobe S = +16m.14s., all readings diminished by 1h. Osaka MN = +20·4m. Nagoya MN = +19·6m. Ootomari MN = +24·8m. Tiflis ePN = +9m.50s., eE = +11m.15s., eN = +19m.29s., eE = +19m.39s. Perth S = +24m.2s. Athens PR_1 = +13m.21s. Upsala MN = +37·9m. Belgrade iP = +11m.0s., PR_1 = +12m.31s., +13m.53s., +15m.7s., +16m.48s., and 18m.9s. Vienna iNZ = +12m.45s., iN = +14m.25s., eN = +19m.49s., iPSE = +20m.53s., iE = +21m.14s., iN = +21m.18s., +24m.8s., and +33m.7s., MZ = +45·5m. Adelaide SR_1 = +25m.30s., eSR_2 = +28m.12s., also two other sets of readings. Zagreb ePR_1NW = +14m.11s. and +15m.32s., eSNW = +20m.17s., eSR_1NE = +27m.1s., MNW = +42·0m., also several e readings, of which the first is taken as eL. Hamburg PR_2 = +15m.53s., SR_2 = +28m.49s., MZ = +44·9m., Rocca di Papa P = +11m.36s. Florence P = +11m.35s., Strasbourg P = +11m.42s., MN = +41·5m. De Bilt PR_1 = +14m.31s., SR_1 = +26m.13s., MN = +42·4m., MZ = +47·6m. Riverview eS = +21m.37s., SR_1 = +26m.46s., MN = +40·1m., MZ = +48·5m., T_o = 6h.44m.30s. Sydney S = +29m.42s., SR_2 = +36m.24s., L = +48·6m. and +53·8m. Uccle PR_1 = +14m.39s., SR_1 = +26m.25s., SR_2 = +29m.30s., MN = +42·5m. Paris MN = +43·5m. Edinburgh SR_1 = +27m.0s., SR_2 = +30m.27s. Eskdalemuir SR_1 = +27m.30s. Bidston P = +12m.46s. Toledo MNW = +49·8m. Granada MN = +50·4m. Coimbra iE = +23m.50s., T_o = 6h.44m.45s. Sitka SE = +29m.42s., LE = +35·4s., LN = +46·0m. Honolulu PR_1E = +25m.48s., SE = +31m.12s., SN = +30m.54s. Wellington e = +31m.30s., +39m.6s., +54m.12s., and +57·4m. Lick eLE = +38·9m. Ottawa SR_2? = +32m.36s., eL = +35·0m. Toronto SN = +26m.40s., SE = +27m.20s., iN = +25m.32s., LN = +29·5m. Ithaca L = +76·5m. and many e readings. Ann Arbor SR_1? = +30m.48s. Georgetown eLN = +28·5m., LE = +58·5m. Washington L = +63·5m. Cheltenham eE = +64m.49s.

June 22d. 12h. 6m. 4s. Epicentre 22°·7N. 99°·0E. (as at 6h.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	E.	9·8	271	2 24	− 3	(4 36)	+13	4·6	—
Hong Kong		14·0	88	5 13	?S	(5 13)	−55	—	6·9
Taihoku		20·7	79	—	—	e 8 39	+ 1	—	—
Zi-ka-wei		21·7	62	e 6 59	+118	—	—	—	—
Manila		22·3	107	e 3 26	?	—	—	—	—
Ekaterinburg		44·0	332	—	—	e 12 43	−139	20·9	23·6
Pulkovo		59·8	329	—	—	e 25 20	?L	32·9	—
Strasbourg		74·0	318	—	—	—	—	e 71·9	—
De Bilt		74·5	321	—	—	—	—	e 45·9	—
Stonyhurst		78·2	324	—	—	—	—	—	16·9

Calcutta gives also PN = +2m.32s.

June 22d. 20h. 45m. 54s. Epicentre 15°·0S. 165°·0E. (as on 1919 Aug. 31d.).

A = −·933, B = +·250, C = −·259; D = +·259, E = +·966; G = +·250, H = −·067, K = −·966.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview		22·6	211	e 5 10	− 2	i 9 14	− 3	e 11·0	12·6
Sydney		22·6	211	5 12	0	—	—	10·9	13·5
Adelaide		31·0	225	—	—	e 11 42	− 9	e 18·5	20·1
Honolulu	E.	51·3	46	17 11	?S	(17 11)	+36	23·6	—
	N.	51·3	46	17 6	?S	(17 3)	+28	24·0	—
Manila		52·6	303	—	—	e 17 6	+15	—	—
Lick		86·4	50	51 52	?L	—	—	(i 51·9)	—
Victoria		89·6	40	24 17	?S	(24 17)	+ 7	42·4	47·2
Chicago		112·8	50	—	—	e 29 6	+74	e 56·1	—
La Paz		118·8	120	22 17	?	—	—	—	—
Toronto		119·0	47	—	—	—	—	e 58·7	—
Georgetown		121·0	51	e 32 42	?	—	—	e 47·4	—
Ottawa		121·1	44	—	—	e 26 44	−134	59·1	—
Pulkovo		124·5	334	i 21 48	?PR_1	e 32 30	?	64·1	72·2
De Bilt	E.	139·6	340	—	—	—	—	e 76·1	77·3
	N.	139·6	340	—	—	—	—	e 74·1	79·4
	Z.	139·6	340	e 19 51	[+12]	—	—	—	83·5
Uccle		140·9	340	e 19 55	[+14]	—	—	e 69·1	—
Innsbruck		141·0	331	i 19 54	[+13]	—	—	—	—
Strasbourg		141·6	333	e 19 59	[+17]	—	—	e 76·1	—
Paris		143·2	340	e 20 3	[+18]	—	—	79·1	—
Rocca di Papa		144·1	323	e 20 0	[+13]	—	—	e 85·3	90·4
Moncalieri		144·4	332	20 30	[+43]	23 36	?PR_1	—	—

Additional readings and notes: Riverview gives also eP = +7m.32s., iS = +19m.18s., MZ = +11·4m., MN = +13·1m. T_0 = 20h.45m.54s. Sydney readings have been diminished by 2h. Adelaide e = +13m.6s. Honolulu SN = +21m.36s. Toronto eL = +38·4m. Ottawa e = +30m.29s., eL = +38·1m. Pulkovo MZ = +72·9m.

June 22d. Readings also at 1h. (La Paz), 5h. (Almeria), 7h. (Zagreb and Rocca di Papa), 9h. (Calcutta, Rocca di Papa, and Hong Kong), 10h. (Zi-ka-wei, Taihoku, Manila, and Ekaterinburg), 16h. (Kodaikanal).

June 23d. 15h. 16m. 57s. Epicentre 24°·0N. 123°·0E. (as on 1922 Sept. 6d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	1·7	308	0 27	+ 1	—	—	0·9	1·2
Hokoto	3·2	262	0 49	− 1	—	—	1·2	—
Zi-ka-wei	7·3	349	—	—	e 3 15	− 3	—	—
Manila	9·6	192	—	—	e 4 3	−15	—	—
Pulkovo	70·8	328	—	—	—	—	e 39·0	—

No additional readings.

June 23d. Readings also at 7h. and 9h. (Lick), 10h. (near Athens), 13h. (Lick).

June 24d. Readings at 3h. (Ekaterinburg), 4h. (Strasbourg), 12h. (De Bilt, Paris, and Riverview), 13h. (Ottawa, Ekaterinburg, and Pulkovo), 20h. (Lick and Ottawa), 22h. (La Paz).

June 25d. Readings at 0h. (Lick and near Taihoku), 1h. (near Nagasaki), 3h. (Lick), 9h. (near Taihoku), 10h. (Zi-ka-wei and Manila), 11h. (Manila, Zi-ka-wei, Ekaterinburg, near Taihoku and Hokoto, and near La Paz), 12h. (De Bilt), 13h. (Ottawa), 14h. (Lick), 21h. (Apia), 22h. (Toronto and Ottawa), 23h. (Rocca di Papa).

June 26d. Readings at 0h. (Ekaterinburg and Nagasaki), 1h. (Honolulu and Apia), 2h. (Ottawa), 5h. (Lick), 8h. (Paris), 11h. (Nagoya and near Mizusawa).

June 27d. Readings at 3h. (near Manila), 19h. (Nagoya), 21h. (Nagasaki and near La Paz), 22h. (near Nagasaki), 23h. (Colombo).

June 28d. 15h. 11m. 30s. Epicentre 45°·0N. 11°·0E.

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Venice		1·1	65	e 0 50	+33	—	—	—	1·3
Florence		1·2	171	0 16	− 2	—	—	—	0·3
Innsbruck		2·3	7	e 0 33	− 3	i 1 4	+ 1	—	—
Moncalieri		2·3	270	0 40	+ 4	1 26	+23	—	1·7
Zurich		2·9	325	e 0 46	+ 1	i 1 34	+14	—	—
Rocca di Papa	E.	3·5	159	e 0 33	−22	0 50	−47	—	1·5
	N.	3·5	159	e 0 30	−25	0 55	−42	—	1·0
Zagreb		3·6	77	e 0 56	0	1 39	0	i 2·0	2·3
Strasbourg		4·1	330	i 1 12	+ 8	1 49	− 4	2·5	2·8
Besançon		4·1	305	1 12	+ 8	1 44?	− 9	—	—
Vienna	Z.	4·9	47	e 1 21	+ 5	i 2 14	0	(i 2·6)	3·1
Pompeii		5·0	147	e 1 30	+13	—	—	—	—
Puy de Dôme		5·7	280	e 1 9	−19	(2 30)	− 6	2·5	3·0
Belgrade		6·7	88	e 2 41	+59	—	—	e 4·3	—
Paris		6·9	306	e 1 46	+ 1	(3 30)	+23	3·5	4·5
Uccle		7·3	325	e 2 6	+15	e 3 54	+36	e 4·4	—
De Bilt		8·0	334	—	—	e 3 48	+11	e 4·8	5·7
Hamburg		8·6	356	—	—	e 4 21	+28	—	6·1
Tortosa		8·7	245	3 10	+58	—	—	5·6	—
Oxford		10·6	314	—	—	(4 5)	−40	4·1	6·5
Eskdalemuir		13·7	324	—	—	e 5 50	−11	7·5	—
Edinburgh		14·0	326	—	—	—	—	—	9·5
Coimbra		15·0	258	—	—	—	—	e 8·8	—
Pulkovo		18·8	31	e 4 15	−12	e 8 19	+21	10·0	12·2

Additional readings: Zurich iPN = +50s. Zagreb ePNE = +58s., P = +1m.5s., iSNW = +1m.48s. Rocca di Papa PN = +37s., PE = +44s. Strasbourg ePV = +57s. Vienna iZ = +2m.1s., MN = +2·8m., MZ = +2·9m. L is given as S. Belgrade iP = +3m.27s., i = +3m.51s., eS = +4m.27s. Paris e = +2m.32s. Hamburg e = +3m.30s., MN = +5·3m., MZ = +5·4m. Tortosa readings are given as for 16h.

June 28d. Readings also at 3h. (Kodaikanal), 7h. (near Sapporo, Hakodate, and Mizusawa, also near Mostar), 8h. (near Mostar), 10h. (near Mizusawa), 16h. (Lick), 18h. (Colombo), 19h. (Ottawa, Uccle, Rocca di Papa, Strasbourg, Paris, De Bilt, near Kobe, and Osaka), 20h. (Zi-ka-wei and near Taihoku), 23h. (Algiers).

June 29d. 10h. 47m. 38s. (I) } Epicentre 28°·5N. 141°·5E.
10h. 53m. 20s. (II) }

A = −·688, B = +·547, C = +·477 ; D = +·622, E = +·783 ;
G = −·373, H = +·297, K = −·879.

See note at end as regards deep focus.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Nagoya		7·7	331	1 48	− 9	—	—	—	—
I Osaka		8·1	321	2 5	+ 2	(3 43)	+ 3	3·7	4·5
II		8·1	321	2 4	+ 1	(3 40)	0	3·7	4·4
I Kobe		8·2	320	e 2 2	− 2	(3 38)	− 4	3·6	3·7
II		8·2	320	e 2 2	− 2	(3 38)	− 4	3·6	3·7
I Mizusawa	E.	10·6	358	2 37	− 1	4 44	− 1	—	—
I	N.	10·6	358	2 36	− 2	4 45	0	—	—
II	E.	10·6	358	2 39	+ 1	4 43	− 2	—	—
I Nagasaki		10·9	296	e 1 54	−49	(3 51)	−61	3·8	—
II		10·9	296	e 2 9	−34	(4 7)	−45	4·1	4·2
I Zi-ka-wei		17·6	284	e 1 7	?	e 6 51	−40	—	—
I Manila		23·6	238	e 5 22	− 2	—	—	—	13·4
I Pulkovo		75·4	332	i 10 59	−52	e 20 3	−87	—	—
II		75·4	332	i 11 1	−50	e 20 5	−85	37·7	43·8
II De Bilt		90·8	336	e 12 14	−66	—	—	e 46·7	—
I Eskdalemuir		90·9	342	—	—	—	—	42·4	—
II Strasbourg		92·6	331	—	—	—	—	e 47·7	—
II La Paz		150·2	73	19 4	[−52]	—	—	—	—

Additional readings: Osaka I gives also MN = +3·9m. Osaka II MNZ = +4·0m. Mizusawa II SN = +4m.44s. Pulkovo II MN = +47·5m. Ekaterinburg gives simply 11h.

It seems clear that we have here a case of deep focus, though the evidence is scarcely sufficient to warrant a definite solution on these lines. The determination of T_0 by Mizusawa is good, though the other Japanese stations give S as L. [If what they give is really L, then S must be earlier and the consequent T_0 would be later, or residuals more negative.] Moreover, it is supported by Pulkovo, in spite of its large residuals. Thus the La Paz [−52s.] indicates a deep focus—say ·060 at least. When the corresponding corrections to Δ are introduced, the observations at Nagoya, Osaka, Kobe, Mizusawa, and Pulkovo are fairly represented, but not those at Nagasaki and Manila. Moreover, if we move the epicentre so as to improve one of these observations we make the other worse. We may briefly indicate both solutions. That which suits Manila is close to 30°·6N. 144°·0E., used on 1919 Feb. 9d. (to which there is a note referring to 1917 July 10d., which has an indication of deep focus.) This would stand (it will suffice to give merely the first record of each observatory).

June 29d. 10h. 47m. 38s. Epicentre 30°·6N. 144°·0E. (as on 1922 Sept. 10d.).

A = −·696, B = +·506, C = +·509.

Focal depth 0·060.

	Corr. for Focus	Δ	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Nagoya	0·0	7·5	1 48	− 6	—	—
Osaka	−0·3	8·3	2 5	+ 4	(3 43)	+ 6
Kobe	−0·3	8·6	2 2	− 4	(3 38)	− 7
Mizusawa	−0·4	8·8	2 37	+30	4 44	+57
Nagasaki	−1·1	12·2	1 54	−52	3 51	−66
Manila	−3·3	26·5	5 22	+ 3	—	—
Pulkovo	−6·9	74·6	10 59	− 3	20 3	+ 5
De Bilt	−7·5	89·8	12 14	−18	—	—

The other solution favours Nagasaki, and incidentally Mizusawa; no epicentre near it has previously been used.

June 29d. 10h. 47m. 38s. Epicentre 27°·3N. 138°·5E.

$A = -\cdot 666$, $B = +\cdot 589$, $C = +\cdot 459$.

Focal depth 0·060.

	Corr. for Focus	Δ	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Osaka	−0·1	7·8	2 5	+ 8	(3 43)	+14
Kobe	−0·1	7·9	2 2	+ 4	(3 38)	+ 7
Nagoya	−0·1	8·0	1 48	−12	—	—
Nagasaki	−0·5	9·2	1 54	−18	3 51	− 5
Mizusawa	−0·9	12·0	2 37	− 9	4 44	−13
Manila	−2·5	20·7	5 22	+63	—	—
Pulkovo	−7·0	75·1	10 59	− 6	20 3	0
De Bilt	−7·5	90·7	12 14	−23	—	—

It appears that the latter is the better supposition, if we can presume an error of 1min. in the Manila reading.

June 29d. Readings also at 0h. (Almeria and near Granada), 4h. (Florence and near Port au Prince), 6h. (Rocca di Papa and Nagasaki), 10h. (Paris), 11h. (near Mizusawa).

June 30d. Readings at 0h. (Pulkovo, Ekaterinburg, Ottawa, Toronto, Victoria, and near Mizusawa), 3h. and 4h. (Nagasaki), 6h. (near Mostar, Belgrade, and Sarajevo), 7h. (Manila), 23h. (La Paz and near Mizusawa).

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