

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

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The International Seismological Summary for 1921 October, November, December.

FORMERLY THE BULLETIN OF THE
BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

The present number of the Summary deals with 65 epicentres, 18 of which are new and 47 repetitions from old epicentres. Corresponding figures are :

	New	Old	Ratio
1913-1920 March	597	550	1.09
1920 Apr.—Dec.	85	139	0.61
1921 Jan.—Mar.	31	30	1.03
Apr.—June	29	36	0.81
July—Sept.	26	36	0.72
Oct.—Dec.	18	47	0.38
All	104	149	0.70

The ratio of New Epicentres to Old is not perhaps decreasing so rapidly as might be expected.

The work of collation is still subject to delays from the tardy receipt of information.

Those observers who have not already communicated their readings for 1922 and 1923 are urgently requested to send them without delay to the University Observatory, Oxford.

There are three cases of suggested abnormal focal depth, viz. :

Oct.	10d.	2h.	5°·0S.	135°·0E.	Depth 0.060
Nov.	15d.	20h.	36°·5N.	70°·5E.	Depth 0.030
Dec.	18d.	15h.	2°·5S.	71°·0W.	Depth 0.080

Attention may be called to the last case, where the possibilities are fully explored in an appended note. For a reason which is not yet ready for publication, it was actually desired to move the Epicentre to the Pacific Ocean, but this was found impossible, and incidentally other changes were tried and found unsatisfactory. The solution with the very deep focus 0.080 is, on the other hand, satisfactory in most ways, though there is a curious divergence of 20 sec. between stations within 45° of the Epicentre and those without in the specification of T_0 .

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In Fascicule No. 2 of Série A of the International Section of Seismology (Travaux Scient.) which has recently been circulated, Professor Rothé has given a discussion of the Strasbourg readings for 1920 in the light of the residuals found in the corresponding numbers of the Summary. These remarks are under consideration, but have not yet been fully dealt with, and comments must be deferred. Meanwhile, the attention of other observatories is invited to the possibility of advancing our imperfect knowledge by such revision of their readings, which has already been urged in individual cases.

A paper has been sent to the R.A.S. for publication in the Geophysical Supplement, discussing the 4-year period in frequency of earthquakes. It appears that the circuit of longitude may be divided into twelve lunes, in which the frequency is similar. These lunes are only approximately of 30° each, and the exact arrangement is shown in the "Cage" printed on p. 135 for convenience of reference. The numbers of earthquakes in the four years concluding with the present in the 12 vertical columns of the "Cage" of lunes are as follows :—

	A	B	C	D	E	F	G	H	I	J	K	L
1918	28	12	7	11	21	30	31	33	39	37	52	49
1919	23	29	16	11	20	36	23	22	30	34	34	32
1920	15	11	11	24	51	32	21	28	24	26	32	26
1921	26	16	16	11	20	25	17	16	33	17	30	31
Sum.	92	68	50	57	112	123	92	99	126	114	148	138

It will be seen that the "Cage" itself represents a marked inequality of distribution, lune K having nearly 3 times the number of lune C during the 4 years. But the 4-year periodicity is superposed on this longitude inequality. In lune E the maximum is in 1920; in lune K it is in 1918. A fuller discussion will be given later.

H. H. TURNER.

University Observatory, Oxford.
1925, October 1.

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y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y
0-00	0-33	0-67	1-00	1-33	1-66	2-00	2-33	2-66	2-99	3-32	3-66	3-99							
A	B	C	D	E	F	G	H	I	J	K	L								
6-8	4-7	1-0	3-1	6-5	9-9	13-4	16-7	19-9	23-0	26-0	29-0	31-9							
31-9	34-7	37-7	40-5	43-1	45-8	48-8	51-6	54-5	57-3	60-0	63-0	65-8							
65-8	68-7	71-8	74-5	77-3	80-3	83-1	86-0	89-0	92-0	95-0	98-0	100-8							
100-8	103-7	106-3	108-0	109-8	111-6	113-4	115-4	117-8	120-4	122-9	125-5	127-8							
127-8	130-2	132-8	135-0	137-1	139-2	141-3	143-5	145-8	147-4	149-3	151-2	153-1							
153-1	155-0	156-8	158-5	160-3	162-1	163-8	165-5	167-2	168-7	170-5	172-2	173-7							
173-7	175-3	176-9	178-4	179-9	178-5	177-0	175-5	174-0	172-4	171-0	169-5	168-1							
168-1	166-5	165-1	163-6	162-1	160-7	159-2	157-6	156-3	154-8	153-3	151-7	149-8							
149-8	148-7	147-1	145-6	144-0	142-4	140-7	139-1	137-5	135-8	134-3	133-0	131-7							
131-7	130-4	129-2	127-8	126-6	125-3	123-5	121-5	119-5	117-5	115-4	113-1	110-9							
110-9	108-4	106-1	103-5	100-9	98-0	94-9	91-5	87-9	84-3	79-9	74-9	67-9							
67-9	61-2	54-5	45-2	38-0	31-0	24-2	18-5	14-3	12-4	10-6	8-7	6-8							

West Longitudes are in italics.

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1921 OCTOBER, NOVEMBER, & DECEMBER.

Oct. 1d. 21h. 2m. 10s. Epicentre 1°8'N. 86°0'W. (as on 1914 Nov. 18d.).

A = +.070, B = -.997, C = +.031; D = -.998, E = -.070;
G = +.002, H = -.031, K = -1.000.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tacubaya	E.	21.9	325	5 25	+21	10 13	+75	12.0	—
La Paz		25.4	137	i 5 42	0	i 10 10	— 1	12.8	16.6
Washington		38.0	13	—	—	e 16 50	? e	21.8	—
Toronto		42.3	7	—	—	—	—	20.5	—
Ottawa		44.5	10	—	—	—	—	22.8	—
Eskdalemuir		84.4	35	—	—	e 23 19	+ 7	39.2	—
Edinburgh		84.5	34	—	—	28 50	?SR ₁	—	—
Stonyhurst		84.7	36	e 23 50	?S	(e 23 50)	+34	—	—
Oxford		85.3	39	—	—	—	—	—	43.1
Uccle		88.8	40	—	—	e 23 50	-11	e 41.8	44.8
De Bilt	E.	89.0	39	—	—	e 23 50	-13	e 41.8	45.5
	N.	89.0	39	—	—	—	—	e 40.8	47.4

Additional readings: Tacubaya gives also LN = +11.9m. La Paz MN = +15.9m., T₀ = 21h.2m.15s. Toronto L = +23.3m. and +27.0m.
Ottawa eLE = +17.8m. Helwan ($\Delta = 112^{\circ}.5$ Az. = 56°) gives 21h.0m.

Oct. 1d. Readings also at 1h. (Batavia), 2h. (La Paz), 4h. (near Batavia), 10h. (Manila, La Paz (2), and Batavia), 11h. (Helwan), 16h. (Paris, De Bilt, Uccle, and Helwan), 17h. (Toronto), 18h. (Batavia), 22h. (near Tacubaya)

Oct. 2d. 14h. 58m. 0s. Epicentre 35°0'N. 139°5'E. (as on 1920 May 22d.).

A = -.623, B = +.532, C = +.574.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo		0.7	16	i 0 19	+ 8	—	—	0.5	0.5
Osaka		3.4	266	1 5	+12	—	—	2.1	2.9
Mizusawa		4.3	17	1 5	- 2	1 44	-14	—	—

No additional readings.

Oct. 2d. 18h. 25m. 8s. Epicentre 55°0'N. 38°0'E.

A = +.452, B = +.353, C = +.819; D = +.616, E = -.788;

G = +.646, H = +.504, K = -.574.

Very rough.

		Δ	Az.	P.	O-C.	S.	O-C.	M.
		°	°	m. s.	s.	m. s.	s.	m
Vienna		14.9	252	i 4 43	+65	—	—	5.9
Strasbourg		19.6	264	e 4 43	+ 7	—	—	—
Uccle		20.5	271	e 4 43	- 4	—	—	—
Rocca di Papa		21.1	242	i 4 54	0	e 8 46	0	—

Helwan ($\Delta = 25^{\circ}.6$) gives PN = 18h.25m.

Oct. 2d. Readings also at 3h. (near Tacubaya), 14h. (La Paz), 18h. (Batavia).

Oct. 3d. Readings at 0h. (near Mizusawa), 3h. (Rocca di Papa), 5h. (La Paz), 6h. (San Fernando), 7h. (near Colima), 10h. (Christchurch and Wellington), 12h. (Rocca di Papa and Belgrade), 17h. (near Sarajevo), 22h. (La Paz and near Mizusawa), 23h. (near Batavia).

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Oct. 4d. 5h. 23m. 0s. Epicentre 34°·5N. 25°·0E. (as on 1920 Nov. 21d.).

A = +·747, B = +·348, C = +·566; D = +·423, E = -·906;
G = +·513, H = +·239, K = -·824.

Very rough determination.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·6	344	e 0 55	- 1	1 46	+ 7	1·9	2·2
Helwan	7·1	129	2 0	+12	—	—	(6·0)	—
Belgrade	N. 10·9	343	e 1 23	-80	—	—	—	—
Rocca di Papa	E. 12·1	310	e 3 0	0	5 6	-15	e 8·0	8·4
	N. 12·1	310	e 3 12	+12	5 30	+ 9	—	—
Pola	13·4	324	—	—	—	—	6·0	—
Vienna	15·2	337	—	—	—	—	e 8·8	11·8
Moncalieri	16·9	314	e 5 47	+103	—	—	9·9	—
Marselles	17·6	306	4 0	-12	—	—	—	—
Strasbourg	19·0	323	e 4 35	+ 6	—	—	—	—
Hamburg	21·8	336	—	—	e 8 0	-61	—	15·0
Uccle	22·1	324	—	—	—	—	e 11·7	—
De Bilt	22·6	327	—	—	—	—	e 12·5	15·3
Oxford	25·6	321	—	—	e 10 20	+ 6	—	—

Additional readings and notes: Athens gives also MN = +2·7m. Belgrade
PR₁ = +5m.1s., SR₁ = +5m.19s., SR₂ = +6m.2s. Rocca di Papa SE and
N are increased by 2m. De Bilt MN = +16·0m.

Oct. 4d. Readings also at 5h. (near Tokyo), 8h. (Batavia), 14h. (Rio Tinto),
19h. (near La Paz), 20h. (Lemberg and Helwan), 21h. (Zi-ka-wei, Taihoku
(2), and Manila), 22h. (De Bilt).

Oct. 5d. 1h. 42m. 20s. Epicentre 50°·0N. 175°·0W. (as on 1919 Jan. 27d.).

A = -·640, B = -·056, C = +·766; D = -·087, E = +·996;
G = -·763, H = -·067, K = -·643.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Honolulu	31·6	147	—	—	—	—	e 15·4	—
Victoria	33·1	71	—	—	(12 38)	+12	12·6	19·5
Zi-ka-wei	Z. 50·1	273	—	—	e 18 35	+135	—	40·8
Chicago	57·8	61	—	—	e 17 45	-11	e 31·3	—
Eakdalemuir	N. 74·4	4	e 11 38	- 7	20 55	-24	36·7	—
De Bilt	77·9	359	—	—	—	—	e 37·7	51·7
Uccle	79·2	0	—	—	e 22 40	+26	e 37·7	—
Batavia	87·2	258	i 13 1	+ 1	—	—	—	17·7
Riverview	89·0	208	—	—	e 30 46	?SR ₁	e 40·2	41·6
Helwan	96·8	337	43 40	?L	(31 40)	?SR ₁	(43·7)	—

Additional readings: De Bilt gives also MN = +54·7m. Batavia iN =
+13m.57s., iE = +14m.32s., and +15m.32s.

Oct. 5d. 4h. 16m. 32s. Epicentre 40°·3N. 139°·5E. (as on 1920 Feb. 7d.).

A = -·580, B = +·495, C = +·647; D = +·649, E = +·760;
G = -·492, H = +·420, K = -·763.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E. 1·7	133	0 33	+ 7	0 58	+10	—	—
	N. 1·7	133	0 34	+ 8	0 59	+11	—	—
Tokyo	4·7	178	i 1 7	- 6	(1 58)	-11	2·0	2·6
Osaka	6·5	212	1 40	+ 1	—	—	3·2	3·6
Zi-ka-wei	Z. 17·2	244	—	—	e 6 57	-25	—	—
De Bilt	79·6	333	—	—	—	—	e 45·5	—
Uccle	80·8	333	—	—	—	—	—	44·5

Additional readings: Tokyo gives also S = +1m.21s. Osaka MN = +4·4m.
Kobe ($\Delta = 6^{\circ} \cdot 6$) ePSEN = 4h.12m.2s.

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Oct. 5d. Readings also at 0h. (Batavia), 12h. (near Belgrade), 17h. (La Paz and near Batavia), 18h. (near Batavia), 20h. (Riverview).

Oct. 6d. 15h. 59m. 36s. Epicentre 43°·0N. 170°·0E.

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

If we accept the Mizusawa S as correct and assume that the P is 1 minute late, an epicentre at 41°·5N. 162°·5E. would satisfy the European observations equally well, and Batavia rather better, but not Manila or La Paz.

	Δ	Az.	P.	O-C.	S.	O-C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Mizusawa	22·0	270	5 1	- 4	7 9	?	—
Manila	50·5	251	—	—	e 17 7	+42	—
Batavia	75·2	247	—	—	i 20 49	-39	—
Eskdalemuir	81·5	357	i 12 35	+ 7	e 20 44	-117	—
Hamburg	81·9	349	i 12 30	0	e 22 46	+ 1	39·4
De Bilt	84·0	351	12 48	+ 6	e 23 56	+48	e 32·4
Uccle	85·4	351	e 12 51	+ 1	e 23 24	+ 1	—
Vienna	85·8	344	i 12 48	- 4	—	—	—
Strasbourg	87·1	349	e 12 59	- 1	—	—	—
Paris	87·5	352	e 13 5	+ 3	e 24 30	+43	e 50·4
Besançon	88·7	350	13 12	+ 3	—	—	—
Padova	89·4	346	13 16	+ 4	—	—	—
Marseilles	92·6	350	e 13 38	+ 8	—	—	—
Rocca di Papa	92·8	344	13 24	- 7	(23 12)	-92	—
Helwan	97·9	325	35 24	?SR ₁	(27 24)	+109	—
La Paz	124·3	82	20 24	?PR ₁	—	—	—

Additional readings and notes : Mizusawa gives also PN = +5m.6s., Eskdalemuir eN = +12m.36s. De Bilt e = +22m.0s. Padova PR₁E = +14m.14s. and PR₁N = +14m.38s. Rocca di Papa SN = +16m.37s., SE = +16m.42s. The S in the table is given as PR₁.

Oct. 6d. Readings also at 7h. (Helwan), 14h. (La Paz), 16h. (near Belgrade), 22h. (Hamburg, Vienna, De Bilt, Taihoku, Helwan, Rocca di Papa, Eskdalemuir, and Uccle).

Oct. 7d. Readings at 2h. (Helwan, near Algiers, and near Mizusawa), 4h. (Helwan), 7h. (near Tokyo), 9h. (Helwan and near Ootomari), 10h. (near Balboa Heights), 13h. (Tifis), 15h. (Hong Kong, Melbourne, Riverview, and Adelaide), 16h. (De Bilt and Uccle), 18h. (Riverview and Melbourne), 20h. (Coimbra), 21h. (Taihoku and Helwan).

Oct. 8d. Readings at 2h. and 7h. (Algiers), 11h. (Batavia and Tifis).

Oct. 9d. 0h. 12m. 54s. Epicentre 15°·0S. 94°·0E.

A = -·067, B = +·963, C = -·259 ; D = +·998, E = +·070 ;
G = +·018, H = -·258, K = -·966.

Very doubtful. It is possible that the epicentre should be in the neighbourhood of 9°·0N. 110°·0E., as on 1918 Aug. 16, but the residuals on that supposition are no better.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	14·3	57	3 42	- 2	6 42	+ 1	e 15·1	—
Perth	26·1	134	—	—	—	—	13·3	—
Kodaikanal	30·1	326	12 24	?S	(12 24)	+48	14·6	19·5
Hong Kong	42·3	29	4 32	?	13 21	-78	19·0	20·6
Taihoku	48·2	34	—	—	—	—	e 21·1	—
Melbourne	50·2	123	—	—	11 12.	?PR ₁	32·5	38·2
Zi-ka-wei	53·2	30	e 9 54	+27	—	—	—	30·2
Riverview	54·6	121	—	—	—	—	e 23·7	34·1
Wellington	73·3	130	—	—	e 23 36	+150	e 39·6	47·1

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helwan	E. 75.2	309	14 12	?PR ₁	—	—	—	47.8
	N. 75.2	309	23 42	?S	(23 42)	+134	—	49.8
Moncalieri		98.0	315	—	e 26 51	+75	51.3	—
Hamburg		98.5	323	—	—	—	e 57.1	62.1
De Bilt	E. 101.1	321	—	—	e 28 39	+153	e 58.1	64.1
	N. 101.1	321	—	—	e 27 11	+65	e 55.1	64.2
Uccle		101.4	320	—	e 27 6	+57	—	65.1
Paris		102.2	318	—	—	—	e 58.1	65.1
Tortosa		102.3	310	—	—	—	e 58.1	64.5
Kew		104.4	320	—	—	—	—	74.1
Oxford		105.0	320	—	—	—	—	64.3
Dyce	N. 105.9	326	27 56	?S	(27 56)	+65	—	60.1
Bidston		106.2	321	—	—	—	53.8	71.7
Eskdalemuir	N. 106.4	324	—	—	e 27 43	+47	51.1	61.6
Victoria		134.7	35	—	69 12?	?L	73.6	84.0
La Paz		143.9	211	22 32	?PR ₁	27 6	?L	82.2
Toronto		150.8	350	—	—	—	—	92.3
Chicago		153.2	3	—	—	—	e 83.1	—

Additional readings: Batavia gives also $i = +5m.0s.$, $e = +5m.24s.$ Manila ($\Delta = 39^\circ.0$) gives $e = +4m.6s.$ Melbourne $P = 0h.12m.48s.$ $SR_1 = +18m.0s.$, $SR_2 = +22m.18s.$ Zi-ka-wei $MN = +29.0m.$ Riverview $e(P?) = 0h.9m.14s.$, $e(S?) = 0h.20m.3s.$, $MN = +34.2m.$ Wellington $eSR_1 = +28m.42s.$, $eSR_2 = +32m.42s.$ Moncalieri $S = +39m.36s.$ Strasbourg ($\Delta = 98^\circ.8$) gives simply $1h.13m.$ Eskdalemuir $eN = +35m.0s.$ ME = +61.3m.

Oct. 9d. Readings also at 1h. (La Paz and Batavia), 4h. (near Batavia), 5h. (Perth, Melbourne, Kodaikanal, Helwan, De Bilt, Uccle, and Eskdalemuir), 6h. (Riverview), 7h. (Toronto, Victoria, and La Paz), 14h. (Batavia), 15h. (Rocca di Papa), 16h. (La Paz), 17h. (Wellington (2)).

Oct. 10d. 2h. 6m. 0s. Epicentre $0^\circ.0. 135^\circ.0E.$ (as on 1921 Mar. 1d.).

$$A = -.707, B = +.707, C = .000; \quad D = +.707, E = +.707; \\ G = .000, H = .000, K = -.1000.$$

An alternative solution with deep focus is given below.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	20.1	317	e 5 25	+43	9 16	+51	10.5	11.6
Taihoku	28.2	334	e 6 41	+31	—	—	11.7	—
Batavia	28.8	257	e 6 54	+38	i 10 37	-36	—	—
Osaka	34.7	1	7 18	+7	—	—	—	15.9
Kobe	34.7	1	e 7 12	+1	—	—	11.2	—
Adelaide	35.1	175	7 18	+4	12 30	-27	—	21.6
Perth	36.7	209	7 7	-21	13 13	-7	—	—
Riverview	37.1	159	e 6 32	-59	e 11 43	-102	e 13.3	17.7
Sydney	37.1	159	—	—	11 36	-109	15.5	21.0
Melbourne	38.9	168	12 18	?	14 18	+27	15.2	20.6
Mizusawa	39.5	8	7 58	+7	—	—	—	—
Hakodate	42.1	7	e 7 32	-40	—	—	—	—
Apia	54.5	106	e 9 0	-36	e 17 0	-15	—	—
Wellington	54.7	144	e 12 18	?PR ₁	i 15 54	-83	24.6	—
Kodaikanal	58.1	282	12 54	?PR ₁	—	—	22.4	26.8
Honolulu	68.6	69	i 19 45	?S	i 19 45)	-24	35.5	—
Victoria	97.8	41	(12 42)	-77	(23 31)	-123	23.5	50.1
Berkeley	100.0	51	e 13 45	-26	—	—	49.5	—
Helwan	101.8	300	19 0	?PR ₁	—	—	—	—
Vienna	108.6	322	14 49	-2	e 26 48	-27	—	67.0
Hamburg	109.9	329	19 0	?PR ₁	—	—	e 51.0	61.0
Pola	111.5	319	e 19 36	?PR ₁	(e 29 24?)	+102	e 29.4?	—
Pompeii	E. 112.6	315	20 44	?PR ₁	—	—	39.0	—
De Bilt	113.2	329	—	—	e 27 45	-11	e 52.0	61.7
Dyce	N. 113.4	336	20 3	?PR ₁	29 56	+119	56.5	71.4
Rocca di Papa	E. 113.5	317	i 18 55	[+22]	i 29 49	+111	e 37.3	—
	N. 113.5	317	i 18 51	[+18]	i 29 44	+106	e 37.2	—
Strasbourg	113.6	324	e 18 47	[+14]	e 31 24	?	e 60.0	63.4
Uccle	114.3	328	e 18 52	[+17]	27 42	-22	e 52.0	60.0
Edinburgh	114.7	334	—	—	30 9	+121	—	66.0

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Eskdalemuir	115.1	334	20 17	?PR ₁	30 5	+114	48.0	83.6
Besangon	115.3	323	18 56?	[+17]	30 46	+154	60.0	—
Moncalieri	115.4	320	e 17 28	+126	28 12	-1	46.2	75.2
Stonyhurst	115.7	333	20 30	?PR ₁	—	—	(e 59.4)	78.5
Bidston	116.3	333	22 5	—	—	—	e 57.3	76.5
Kew	116.3	330	—	—	—	—	—	75.0
Paris	116.4	326	e 18 48	[+ 6]	e 30 55	+154	59.0	66.0
Oxford	116.6	331	—	—	—	—	46.0	64.4
Marselles	117.6	320	e 19 44	[+58]	—	—	e 54.0?	78.0
Tortosa	122.0	320	e 18 0	[-58]	—	—	e 55.0	67.8
Algiers	122.3	315	19 7	[+ 8]	24 24	?	38.0	—
Granada	126.7	318	i 19 18	[+ 8]	30 6	+28	—	—
Toronto	126.7	30	—	—	(32 24)	?	62.0	—
Coimbra	127.8	324	e 19 20	[+ 7]	i 22 33	?PR ₁	e 59.0	—
San Fernando	128.8	319	23 0	?PR ₁	—	—	—	73.5
La Paz	151.8	127	i 19 50	[- 9]	e 33 21	?	66.0	72.0

Additional readings: Manila gives also MN = +11.5m. Batavia i = 7m.41s. and +9m.25s. Riverview eP = +7m.2s. and +8m.19s., eS = +11m.33s., MZ = +18.5m. Osaka MN = +17.9m. Kobe P has been increased by 12m. Hakodate reading is given as at 7h. Mizusawa SN = +7m.56s. Honolulu SN = +27m.2s., SR,N = +31m.7s. Berkeley LE = +51.5m. Helwan PN = +21m.0s. Algiers P = +32m.26s. Rocca di Papa eN = +18m.46s., eSE = +29m.40s., e = +33m.16s., eL = +35.4m. De Bilt ePR₁ = +20m.9s., eN = +27m.52s., e = +29m.50s., MN = +60.1m., T₀ = 2h.6m.28s. Epicentre 5°-0S. 139°-7E. Dyce i = +40m.13s. and +49m.3s. Uccle e = +20m.7s. and +30m.0s. Eskdalemuir MN = +82.9m. Stonyhurst gives eP and eL as eP of independent shocks. Paris MN = +62.0m. Toronto readings both given as L. Coimbra iN = +22m.37s. San Fernando MN = +86.7m.

Oct. 10d. 2h. 6m. 30s. Epicentre 5°-0S. 135°-0E.

$$A = -.704, B = +.704, C = -.087; D = +.707, E = +.707; \\ G = +.062, H = -.062, K = -.996.$$

A depth 0.060 of focus is assumed. An alternative solution without deep focus is given above.

	Corr. for Focus	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	-3.0	24.0	325	e 4 55	+ 2	8 46	+ 2	10.0	11.1
Batavia	-3.5	28.0	266	e 6 24	+51	i 10 7	+13	—	—
Adelaide	-3.7	30.1	174	6 48	+56	12 0	+90	—	21.1
Perth	-3.9	32.4	211	6 37	+24	12 43	+95	—	—
Taihoku	-4.0	32.7	340	e 6 11	- 4	(11 15)	+ 3	11.2	—
Riverview	-4.1	33.3	153	e 6 2	-18	e 11 13	- 7	e 12.8	17.2
Sydney	-4.1	33.3	153	—	—	11 6	-14	15.0	20.5
Melbourne	-4.1	34.0	165	11 48	?S	(11 48)	+16	14.7	20.1
Osaka	-4.7	39.7	1	6 48	-25	—	—	—	15.4
Kobe	-4.7	39.7	1	e 6 42	-31	—	—	10.7	—
Mizusawa	-5.1	44.5	8	7 28	-22	—	—	—	—
Hakodate	-5.3	47.0	6	e 7 2	-67	—	—	—	—
Wellington	-5.6	50.8	142	e 11 48	?	i 15 24	+ 6	24.1	—
Apia	-5.8	53.1	103	9 30	+41	16 30	+45	—	—
Kodaikanal	-6.2	58.3	285	12 24	?PR ₁	13 48	?	21.9	26.3
Honolulu	-6.8	70.6	67	i 19 15	?S	(i 19 15)	+ 4	35.0	—
Victoria	-7.8	101.5	42	(12 12)	-64	(23 12)	-101	23.0	49.6
Berkeley	-7.9	102.5	53	e 13 15	-26	—	—	49.0	—
Helwan	-7.9	104.3	299	18 30	?PR ₁	—	—	—	—
Vienna	—	112.5	320	e 14 19	-50	e 26 18	-92	—	66.5
Hamburg	—	114.2	327	18 30	?PR ₁	—	—	e 50.5	60.5
Pola	—	115.3	318	e 19 6	?PR ₁	(e 28 54?)	+42	e 28.9?	—
Pompeii	N.	116.1	312	20 14	?PR ₁	—	—	38.5	—
Rocca di Papa	N.	117.1	314	i 18 21	[-23]	i 29 14	+47	e 36.7	—
Rocca di Papa	E.	117.1	314	i 18 25	[-19]	i 29 19	+52	e 36.8	—
De Bilt	—	117.5	327	—	—	e 27 15	-45	e 51.5	61.2
Strasbourg	—	117.7	321	e 18 17	[-29]	e 30 54	?	e 59.5	62.9
Dyce	N.	118.0	335	19 33	?PR ₁	29 26	+52	56.0	70.9
Uccle	—	118.6	326	e 18 22	[-27]	e 27 12	-87	e 51.5	59.5
Moncalieri	—	119.2	319	e 16 58	+79	27 42	-61	45.7	74.7

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	Corr. for Focus	Δ	Az.	P.		O-C.		S.	O-C.		L.	M.
				m.	s.	s.	m.		s.	m.		
Edinburgh	—	119·2	333	—	—	—	—	29	39	+56	—	65·6
Besançon	—	119·3	321	18	26?	[-25]	—	30	16	+92	59·5	—
Eskdalemuir	—	119·7	333	19	47	[+56]	—	29	35	+48	47·5	83·1
Stonyhurst	—	120·2	331	e 20	0	? PR ₁	—	—	—	—	(e 58·9)	78·0
Paris	—	120·6	325	e 18	18	[-36]	e 30	25	+91	—	58·5	65·5
Kew	—	120·7	330	—	—	—	—	—	—	—	—	74·5
Bidston	—	120·8	331	21	35	? PR ₁	—	—	—	—	e 56·8	76·0
Oxford	—	120·9	330	—	—	—	—	—	—	—	45·5	63·9
Marseilles	—	121·5	318	e 19	14	[+17]	—	—	—	—	e 53·5?	77·5
Tortosa	—	125·6	317	e 17	30	[-97]	—	—	—	—	e 54·5	67·3
Algiers	—	125·8	312	18	37	[-31]	—	23	54	? PR ₁	37·5	—
Granada	—	130·4	315	i 18	48	[-31]	—	29	36	?	—	—
Toronto	—	130·9	31	—	—	—	—	(31 54)	?	?	61·5	—
Coimbra	—	131·8	321	e 18	50	[-33]	i 22	3	? PR ₁	e 58·5	—	—
San Fernando	—	132·6	316	22	30	? PR ₁	—	—	—	—	—	73·0
La Paz	—	148·6	134	i 19	20	[-34]	e 32	51	?	65·5	—	71·5

Oct. 10d. 8h. 30m. 20s. Epicentre 37°·5N. 134°·5E. (as on 1921 June 25d.).

A = -·556, B = +·566, C = +·609 ; D = +·713, E = +·701 ;
G = -·425, H = +·434, K = -·793.

	Δ	Az.	P.		O-C.	S.	O-C.	M.
	°	°	m.	s.	s.	m.	s.	m.
Osaka	2·9	165	0	43	- 2	(1 26)	+ 6	2·1
Tokyo	4·3	113	e 1	13	- 1	(1 58)	-13	2·0
Mizusawa	5·4	71	1	27	+ 4	2 41	+13	—

Osaka MN = +1·5m. S is given as L.

Oct. 10d. Readings also at 2h. (Belgrade and Kodaikanal), 12h. (La Paz), 15h. (St. Louis), 21h. (Taihoku).

Oct. 11d. Readings at 1h. (Nagasaki), 2h. (Tokyo), 4h. (near La Paz), 6h. (Zi-ka-wei and Hong Kong), 7h. (Batavia), 10h. (Manila), 14h. and 17h. (Hong Kong).

Oct. 12d. 7h. 52m. 12s. Epicentre 46°·7N. 145°·8E. (as on 1920 Feb. 22d.).

A = -·567, B = +·386, C = +·728 ; D = +·562, E = +·827 ;
G = -·602, H = +·409, K = -·686.

	E.	N.	Δ	Az.	P.		O-C.		S.	O-C.		L.	M.
					m.	s.	s.	m.		s.	m.		
Ootomari	—	—	2·1	270	1	11	+38	—	(1 11)	+13	2·0	2·2	
Hakodate	—	—	6·1	218	e 1	42	+ 9	—	—	—	2·9	3·9	
Mizusawa	E.	—	8·3	206	2	5	- 1	3	39	- 6	—	—	
Mito	—	—	11·0	203	2	59	+15	—	—	—	5·4	6·3	
Tyosi	—	—	11·6	200	2	48	- 5	(4 45)	—	-24	4·8	5·2	
Tokyo	—	—	11·9	205	e 3	5	+ 7	3	42	-95	4·9	6·2	
Osaka	—	—	14·3	217	4	22	+52	—	—	—	—	7·4	
Hukuoka	—	—	17·5	227	4	15	+ 4	—	—	—	—	7·9	
Zi-ka-wei	—	—	24·3	239	e 5	30	- 1	—	—	—	—	—	
Manila	—	—	38·2	220	e 7	43	+ 8	—	—	—	—	—	
Batavia	—	—	63·1	225	e 10	31	- 2	i 18	52	-10	—	—	
Kodaikanal	—	—	67·3	264	67	6	?	—	—	—	72·3	79·0	
Dyce	—	N.	72·7	344	—	—	—	—	—	—	e 70·8	81·8	
Hamburg	—	—	73·0	335	—	—	—	e 20	48	-14	e 69·8	—	
Edinburgh	—	—	74·2	343	—	—	—	—	—	—	64·8	—	
Eskdalemuir	—	—	74·7	343	—	—	—	e 21	21	- 1	e 40·8	71·8	
Vienna	—	—	75·3	329	i 11	52	+ 1	e 21	43	+19	e 64·8	75·0	
De Bilt	—	—	75·6	336	—	—	—	e 21	35	+ 2	e 64·8	75·0	
Bidston	—	—	76·5	340	—	—	—	i 21	41	- 2	69·0	75·4	

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Uccle	77.0	337	—	—	—	—	e 63.8	69.8
Kew	77.6	340	—	—	—	—	—	80.8
Strasbourg	78.0	332	—	—	e 38 48	?L	69.6	—
Paris	79.3	338	e 22 15	?S	(e 22 15)	0	69.8	72.8
Padova	79.4	330	12 35	+20	22 22	+ 6	—	—
Riverview	80.7	175	e 32 54	?i	—	—	e 70.2	72.2
Moncalieri	81.2	331	e 20 51	?S	34 32	?i	51.2	—
Rocca di Papa	82.2	326	i 12 27	- 4	i 22 42	- 6	e 66.1	80.1
Helwan	E. 83.4	308	23 12	?S	(23 12)	+11	—	73.2
	N. 83.4	308	21 12	?S	(21 12)	-109	—	72.2
Marseilles	83.4	332	—	—	—	—	—	67.8
Melbourne	84.2	181	—	—	—	—	—	66.3
Rio Tinto	92.0	340	62 48	?L	—	—	(62.8)	68.8
San Fernando	93.2	339	60 12	?L	—	—	(60.2)	68.2
Cape Town	138.7	268	20 47	[+70]	—	—	—	—
La Paz	138.8	54	20 41	[+63]	i 27 42	?i	38.1	48.0

Additional readings : Ootomari gives also MN = +2.1m. Hakodate MN = +3.6m. Mizusawa SN = +3m.38s. Tyosi MN = +6.3m. Tokyo MN = +7.4m. Osaka MN = +7.3m. Hamburg MN = +78.7m. De Bilt MN = +73.8m. Epicentre 42°2N. 146°5E. San Fernando MN = +65.2m. La Paz LN = +35.2m., LE = +35.9m., T₀ = 8h.4m.2s. Possibly an independent shock.

Oct. 12d. Readings also at 0h. (La Paz), 8h. (Belgrade and Mizusawa), 9h. (Mizusawa), 10h. (Taihoku), 13h. (La Paz), 16h. (near Mizusawa), 18h. (Colombo).

Oct. 13d. Readings at 1h. (Apia), 6h. (Colombo), 9h. (La Paz), 12h. (Hong Kong (2) and Zi-ka-wei), 13h. and 16h. (La Paz), 19h. (near Kobe and Osaka, and near Tacubaya).

1921. Oct. 14d. 16h. 43m. 45s. Epicentre 30°5N. 91°0E.

A = -.015, B = +.861, C = +.508 ; D = +1.000, E = +.017 ; G = -.009, H = +.508, K = -.862.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	E. 8.4	197	2 9	+ 2	3 45	- 2	4.8	5.8
Dehra Dun	11.2	272	2 15	-32	—	—	—	—
Simla	11.9	277	e 5 45	?L	—	—	(e 5.8)	—
Bombay	20.2	239	10 46	?L	—	—	(10.8)	—
Hong Kong	22.3	106	5 9	0	9 15	+ 4	11.7?	12.8
Colombo	25.8	206	6 15	+29	10 39	+21	16.8	20.6
Zi-ka-wei	26.0	81	e 5 49	+ 1	e 10 29	+ 7	—	17.4
Taihoku	27.5	94	—	—	e 11 0	+10	15.6	—
Manila	31.8	114	—	—	e 12 19	+14	—	—
Osaka	37.4	71	9 31	?PR ₁	—	—	—	23.5
Batavia	39.7	155	e 8 46	+54	i 19 30	?PR ₁	23.4	—
Tokyo	40.7	70	e 8 59	+58	—	—	—	27.5
Helwan	E. 50.9	284	12 51	?PR ₁	—	—	—	36.8
	N. 50.9	284	16 39	?S	(16 39)	+ 9	—	35.2
Lemberg	52.7	312	e 7 51	-93	—	—	e 32.2	35.6
Belgrade	55.8	306	e 3 20	-385	e 11 27	-364	e 17.8	28.7
Budapest	56.3	311	—	—	e 18 15	+37	e 22.2	33.2
Vienna	57.9	312	e 9 57	- 1	e 17 57	- 1	e 31.2	43.8
Pola	60.4	309	—	—	e 18 34	+ 6	e 28.2	39.4
Hamburg	60.8	319	—	—	e 21 15	?i	31.2	35.4
Rocca di Papa	N. 62.1	304	e 10 27	+ 1	18 47	- 2	e 34.6	43.8
Strasbourg	63.4	313	e 10 56	+22	—	—	32.9	37.9
De Bilt	E. 64.0	318	—	—	e 19 18	+ 5	e 31.2	37.1
	N. 64.0	318	—	—	—	—	e 30.2	37.0
Moncalieri	64.5	310	—	—	19 28	+ 9	—	34.4
Uccle	64.8	317	—	—	—	—	—	37.4
Besançon	64.9	312	—	—	—	—	—	34.2
Dyce	N. 66.3	325	—	—	—	—	33.3	35.3

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Paris	66.6	315	—	—	e 27 15	?L	34.2	42.2
Marseilles	66.7	308	—	—	—	—	e 36.2	41.2
Kew	67.3	319	—	—	—	—	—	45.2
Edinburgh	67.3	322	—	—	—	—	35.2	39.1
Eskdalemuir	N. 67.5	322	—	—	e 20 3	+ 7	32.2	37.4
Stonyhurst	67.7	320	e 20 45	?S	(20 45)	+47	—	41.2
Oxford	67.8	319	—	—	—	—	34.0	44.6
Tortosa	70.9	308	20 35	?S	(20 35)	- 2	e 36.2	41.1
Rio Tinto	77.2	308	32 15	?L	—	—	(32.2)	50.2
Coimbra	E. 77.4	310	22 33	?S	(22 33)	+40	38.1	45.6
	N. 77.4	310	—	—	—	—	41.9	45.8
San Fernando	77.6	306	—	—	—	—	45.5	50.2
Cape Town	94.0	232	49 33	?L	—	—	(49.6)	—
Victoria	95.2	22	—	—	47 1	?L	51.4	61.8
Berkeley	Z. 105.0	27	e 39 15	?L	—	—	(e 39.2)	—
Toronto	105.3	352	—	—	—	—	63.6	71.8
Chicago	107.7	358	—	—	—	—	e 63.0	—
La Paz	156.4	302	e 20 27	[+23]	—	—	79.2	82.8

Additional readings: Zi-ka-wei gives also PSN = +10m.39s., PSE = +10m.45s., MN = +15.6m. Osaka MN = +21.4m. Tokyo MN = +30.0m. Belgrade eLN = +17.0m. There appears to be an error in the time. Hamburg MZ = +41.6m. Rocca di Papa ePE = +10m.24s., also the following: e?? = +8m.3s., eE = +9m.15s., eN = +9m.27s. De Bilt e = +26m.25s. Epicentre 29° 9'N. 90° 4'E. Paris MN = +39.2m. Moncalieri e = +4m.27s., MN = +42.5m. Eskdalemuir eN = +27m.15s., ME = +37.7m. Tortosa S? = +28m.30s. Coimbra S? = +30m.43s. San Fernando MN = +51.4m. La Paz P = +21m.1s.

Oct. 14d. Readings also at 5h. (Vera Cruz), 15h. (Nagasaki), 17h. (Batavia and near Belgrade), 18h. (Rocca di Papa).

1921. Oct. 15d. 4h. 58m. 5s. Epicentre 14° 0S. 166° 5E.

A = - .943, B = + .227, C = - .242 ; D = + .233, E = + .972 ;
G = + .235, H = - .056, K = - .970.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	21.1	92	i 4 51	- 3	—	—	—	9.6
Riverview	24.2	212	i 5 26	- 4	e 10 3	+15	e 11.4	12.4
Sydney	E. 24.2	212	4 7	-83	9 25	-23	12.9	14.2
Wellington	28.2	167	e 6 13	+ 3	i 10 43	-20	12.9	14.9
Adelaide	32.7	226	i 6 55	+ 1	i 12 7	-12	e 14.3	20.0
Honolulu	E. 49.6	45	e 9 6	+ 2	(16 6)	- 8	23.0	28.5
	N. 49.6	45	—	—	—	—	22.8	27.1
Manila	53.3	300	e 9 35	+ 7	—	—	—	—
Tokyo	55.7	334	i 5 22	?	e 12 24	?PR ₁	e 20.5	24.4
Osaka	56.9	330	10 0	+ 9	17 52	+ 7	26.5	31.4
Kobe	57.0	330	e 9 49	- 3	—	—	—	—
Mizusawa	N. 58.2	339	9 54	- 6	18 1	0	—	—
Nagasaki	58.4	325	10 0	- 1	18 9	+ 5	24.8	—
Taihoku	58.6	313	e 10 7	+ 4	(18 23)	+17	18.4	—
Hukuoka	58.7	326	10 33	+30	18 35	+28	25.2	30.5
Batavia	59.0	271	10 13	+ 8	—	—	e 25.9	27.9
Hakodate	60.6	340	e 10 53	+37	—	—	—	12.2
Zi-ka-wei	62.5	319	e 10 30	+ 1	e 18 50	- 5	—	—
Hong Kong	62.8	307	10 31	0	(19 18)	+20	19.3	20.2
Berkeley	84.4	49	e 12 52	+ 8	e 14 20	?	e 39.3	39.9
Calcutta	E. 84.7	295	13 13	+27	(23 25)	+ 9	23.4	—
Victoria	87.9	39	12 33	-31	(22 52)	-59	22.9	51.4
Colombo	88.3	277	10 25	-162	(23 55)	0	23.9	63.7
Tucson	E. 91.4	57	—	—	e 25 41	+73	42.8	46.4
Kodaikanal	91.6	280	12 19	-66	—	—	57.1	61.7
Simla	96.6	300	e 24 13	?S	(e 24 13)	-69	—	41.5
St. Louis	109.0	53	—	—	e 28 55	+96	e 57.0	58.4

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Chicago	111-1	50	19 25	?PR ₁	28 55	+77	e 51-9	—
Ann Arbor	114-0	49	—	—	—	—	58-9	—
Toronto	117-0	46	i 21 25	?PR ₁	30 7	+101	63-7	73-9
La Paz	118-0	119	e 15 24	-10	28 26	-8	55-2	59-4
Ithaca	119-3	48	—	—	—	—	52-9	—
Georgetown	E. 119-3	51	e 22 22	?PR ₁	30 22	+98	61-0	—
	N. 119-3	51	e 22 25	?PR ₁	30 22	+98	61-4	—
Washington	119-3	51	—	—	—	—	e 51-9	—
Ottawa	119-3	44	—	—	e 29 55	+71	e 56-9	—
Cheltenham	119-4	51	—	—	(27 40)	-65	49-4	72-2
Fordham	121-5	50	—	—	—	—	—	118-4
Cape Town	123-2	212	53 14	?L	—	—	(53-2)	—
Lemberg	132-9	326	e 14 31	? e 23 7	?PR ₁	—	—	23-2
Helwan	E. 135-8	299	19 55	[+23]	—	—	—	98-6
	N. 135-8	299	25 7	—	—	—	—	115-7
Dyce	E. 135-9	352	i 22 56	?PR ₁	—	—	64-9	77-0
	N. 135-9	352	i 22 21	?PR ₁	—	—	64-4	76-9
Hamburg	Z. 136-3	340	e 19 24	[-9]	—	—	e 62-9	80-1
Budapest	137-0	328	e 18 51	[-43]	—	—	e 39-9	69-9
Edinburgh	137-4	351	e 22 55	?PR ₁	—	—	61-9	78-9
Vienna	137-8	330	i 19 27	[-9]	e 29 41	? e 46-9	79-5	—
Belgrade	137-8	323	e 19 30	[-6]	e 33 20	? e 69-5	—	—
Eskdalemuir	N. 137-9	351	e 19 31	[-5]	—	—	64-9	119-8
De Bilt	139-1	342	e 19 39	[+1]	e 22 18	?PR ₁	e 63-9	74-2
Stonyhurst	139-2	349	e 22 13	?PR ₁	35 43	? e 70-3	123-9	—
Uccle	140-5	342	e 19 33	[-7]	—	—	—	80-0
Oxford	141-0	347	—	—	—	—	—	81-7
Kew	141-1	347	25 55	?PR ₁	—	—	—	116-9
Strasbourg	141-2	336	19 36	[-5]	e 32 42	? e 71-6	81-5	—
Pola	141-4	329	e 19 50	[+8]	—	e 61-0	76-0	—
Padova	142-0	331	19 44	[+1]	—	—	—	—
Paris	142-8	343	e 19 58	[+13]	—	—	68-9	81-9
Besançon	143-0	336	20 12?	[+27]	—	—	72-9	—
Pompeii	E. 143-8	322	19 55	[+8]	—	—	76-9	—
Moncalieri	144-2	332	19 42	[-5]	31 33	? e 47-5	82-2	—
Rocca di Papa	144-2	325	i 19 35	-12	e 25 3	?PR ₁	e 66-6	—
Marseilles	146-5	333	e 19 55	+4	—	—	e 73-9	87-9
Barcelona	149-4	334	e 19 49	[-6]	—	—	e 38-8	—
Tortosa	150-5	338	19 55	-1	33 32	? e 61-2	107-4	—
Algiers	152-8	330	19 54	[-6]	30 49	? e 46-9	84-9	—
Colmbra	E. 153-4	351	20 14	[+14]	30 42	? e 44-8	90-5	—
	N. 153-4	351	—	—	—	—	48-4	98-7
Granada	155-2	341	20 20	[+18]	—	—	—	—
San Fernando	156-6	345	20 13	[+9]	—	—	—	115-7

Additional readings : Apia gives also +5m.18s., T₀=4h.57m.22s. Riverview
 iP = +5m.54s. and +6m.23s., eS = +10m.23s. and +10m.51s., MN = +12-2m.,
 MZ = +14-4m., T₀=4h.57m.36s. Epicentre 11°-0S. 165°-0E. Adelaide
 i = +11m.55s. and +12m.13s. Honolulu gives S as P and SE = +20m.20s.,
 SN = +20m.45s. Osaka MN = +29-9m. Mizusawa PE = +29m.50s.
 Batavia i = +11m.58s. and +19m.9s., iE = +19m.48s. Berkeley LN =
 +39-5m. Victoria S = +16m.58s., MZ = +49-9m. Tucson eSE =
 +30m.19s. St. Louis e = +23m.37s. Chicago SR₁ = +35m.10s.
 Ann Arbor LN = +59-1m. Toronto SR₁ = +36m.37s., i = +50m.13s.,
 eL = +65-8m., and +77-0m. La Paz iP? = +19m.15s., iSR₁ = +30m.15s.,
 L (rep) = 6h.51m.20s. Ithaca L = +59-9m. Georgetown eLE =
 +37-1m., LN = +37-5m. Ottawa eSR₁?E = +36m.42s. Cheltenham
 S given as PR₁E, also SE = +34m.6s. (?SR₁), MN = +72-7m. Dyce iN =
 +23m.14s., iEN = +31m.26s. Hamburg iZ = +22m.28s., eE = +23m.10s.,
 iN = +23m.18s., ME = +66-1m., MNZ = +80-1m. Budapest e =
 +21m.55s. Vienna iN = +22m.38s. Belgrade iPE = +20m.17s., PR₁N =
 +21m.52s., PR₁E = +22m.32s., PR₁ = +23m.15s., PR₁E = +25m.51s.,
 PR₁N = +29m.32s., eLN = +69-6m. Eskdalemuir iN = +22m.28s., and
 +23m.21s., ME = +79-2m. De Bilt MN = +82-0m. Uccle PR₁ =
 +22m.53s., SR₁ = +33m.5s. Strasbourg MN = +76-8m., MZ = +83-9m.
 Pola MN = +81-8m. Padova PR₁N = +22m.3s., PR₁E = +24m.19s.
 Paris MN = +72-9m. Pompeii LE = +41-9m. Moncalieri MN =
 +89-3m. Rocca di Papa PR₁E = +20m.19s., PR₁N = +20m.25s. Algiers
 MN = +100-9m. San Fernando MN = +115-8m.

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Oct. 15d. Readings also at 1h. (Calcutta), 2h. (Eskdalemuir, De Bilt, Uccle, and Helwan), 6h. (Rocca di Papa and Manila), 7h. (near Hakodate), 8h. (near Mizusawa), 10h. (Colombo, Kodaikanal, Helwan, and Rocca di Papa), 15h. (Apia), 16h. (Dehra Dun).

Oct. 16d. Readings at 3h. (La Paz), 7h. (Calcutta), 8h. (De Bilt), 10h. (near Tokyo), 22h. (near Batavia and Padova), 23h. (La Paz).

Oct. 17d. Readings at 0h. (near Taihoku), 1h. (Batavia and Zi-ka-wei), 6h. (Strasbourg), 8h. (Apia and Zi-ka-wei), 11h. (La Paz and near Balboa Heights), 16h. (De Bilt), 20h. (2) and 21h. (Batavia), 23h. (Lick).

Oct. 18d. 0h. 27m. 50s. Epicentre 18°-0S. 173°-5E. (as on 1920 Jan. 1d.).

A = -0.945, B = +0.108, C = -0.309; D = +0.113, E = +0.994;
G = +0.307, H = -0.035, K = -0.951.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	14.8	76	2 10	-86	—	—	—	—
Riverview	25.5	227	e 5 46	+ 3	e 10 18	+ 5	e 12.9	14.8
Christchurch	25.6	181	—	—	11 58	?L	19.2	21.2
Adelaide	35.3	234	—	—	e 12 34	-26	e 17.8	21.7
Honolulu	48.3	39	—	—	—	—	e 25.2	—
Perth	53.5	243	—	—	16 40	-23	—	—
Batavia	65.9	273	e 11 15	+25	i 18 40	-56	—	—
Berkeley	82.1	46	—	—	—	—	e 41.7	—
Lick	z. 82.4	46	—	—	—	—	i 38.4	—
Kodaikanal	98.9	279	57 10	?L	—	—	(57.2)	—
Chicago	108.4	51	—	—	—	—	e 55.2	—
Stonyhurst	143.9	355	e 83 40	?L	—	—	(e 83.7)	—
Helwan	E. 144.2	297	85 10	?L	—	—	(85.2)	—
De Bilt	E. 144.7	348	—	—	—	—	e 72.2	84.0
	N. 144.7	348	—	—	—	—	e 75.2	79.5
Uccle	146.1	349	—	—	—	—	e 71.2	—
Rocca di Papa	151.1	330	e 20 6 [+ 9]	—	—	—	—	—

Additional readings and notes: Riverview MN = +14.3m. Lick gives its reading 1h. too early. Helwan gives also PN = +89m.10s. Rocca di Papa ePN = +20m.13s.

Oct. 18d. 11h. 57m. 5s. Epicentre 18°-0S. 173°-5E. (as at 0h.).

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	25.5	227	e 6 13	+30	e 10 13	0	e 11.9	12.8
Adelaide	35.3	234	—	—	—	—	—	20.7
Kodaikanal	98.9	279	57 7	?L	—	—	(57.1)	—
Chicago	108.4	51	—	—	—	—	e 54.9	—
La Paz	110.2	118	36 36	?SR ₁	—	—	—	—
Helwan	E. 144.2	297	83 55	?L	—	—	(83.9)	—
De Bilt	144.7	348	—	—	—	—	73.9	—

Additional readings: Riverview gives P as e?, MN = +13.9m. Helwan PN = +90m.55s.

Oct. 18d. Readings also at 20h. (near Tortosa), 21h. (La Paz).

Oct. 19d. Readings at 3h. (Riverview), 5h. (Manila), 8h. and 11h. (La Paz) 12h. (La Paz and Colombo), 14h. (Manila), 22h. (near Lick and near La Paz), 23h. (near Lick).

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1921. Oct. 20d. 6h. 3m. 15s. Epicentre 18°0S. 66°0W.

A = +.387, B = -.869, C = -.309; D = -.914, E = -.407;
G = -.126, H = +.282, K = -.951.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	m. s.	m. s.	s.	m. s.	s.	m.	m.
La Paz		2.5	306	i 1 3	+24	1 43	+34	—	—
Rio de Janeiro	E.	21.9	107	i 4 52	-12	10 3	+60	15.1	15.8
	N.	21.9	107	i 5 15	+11	10 25	+82	13.8	15.0
Balboa Heights	E.	30.1	334	6 5	-24	11 5	-31	14.8	12.0
	N.	30.1	334	6 3	-26	11 3	-33	—	12.0
Porto Rico		36.2	2	7 23	-1	12 54	-19	16.0	16.3
Vera Cruz		47.5	320	8 18	-33	—	—	—	17.2
Tacubaya		49.6	318	8 43	-21	15 42	-32	20.3	—
Cheltenham	E.	57.7	352	—	—	17 51	-4	25.4	—
	N.	57.7	352	10 2	+5	18 0	+5	25.5	38.4
Georgetown	E.	57.8	351	e 9 58	0	i 17 55	-1	38.2	—
	N.	57.8	351	i 9 58	0	i 17 54	-2	e 25.2	—
	Z.	57.8	351	i 9 52	-6	17 50	-6	32.3	—
		57.8	351	9 53	-5	17 53	-3	e 35.2	—
Washington		61.0	340	(i 10 11)	-8	i 10 11	?P	—	18.3
St. Louis		61.2	353	e 10 20	0	e 18 38	0	26.2	—
Ithaca		61.9	348	10 21	-3	19 39	+52	—	—
Ann Arbor		62.8	350	—	—	i 19 27	+29	e 32.8	36.0
Toronto		63.0	344	9 51	-41	18 17	-44	28.8	—
Chicago		64.0	355	10 35	-3	19 11	-2	e 29.8	—
Ottawa		66.1	320	10 40	-12	18 53	-45	28.0	—
Tucson	E.	67.4	35	20 9.	?S	(20 9)	+14	—	—
Azores		75.6	122	11 48	-5	21 23	-10	—	21.5
Cape Town		76.2	319	e 11 52	-4	i 21 15	-24	—	—
Lick	N.	76.9	319	i 11 43	-17	i 21 22	-26	e 37.8	—
Berkeley		78.4	46	12 16	+7	22 24	+19	34.2	52.6
San Fernando		79.1	41	12 8	-6	i 22 16	+3	37.8	44.6
Coimbra	N.	79.1	41	—	—	i 22 20	+7	—	44.5
		80.5	47	i 12 21	-1	22 31	+2	—	—
Granada		83.7	327	11 14	-86	(i 21 4)	-122	i 20.1	24.0
Victoria		85.0	49	12 44	-4	i 23 6	-13	e 39.8	51.8
Algiers		85.2	45	12 50	+1	i 23 3	-18	36.0	—
Tortosa		86.5	45	e 12 57	+1	i 23 11	-25	—	24.3
Barcelona		89.4	34	13 34	+22	23 28	-39	—	—
Bidston		89.5	35	i 13 35	+22	i 23 24	-45	—	49.8
Oxford	E.	89.9	35	—	—	—	—	—	26.8
Kew		90.0	34	13 3	-13	(23 27)	-47	23.4	24.6
Stonyhurst		90.2	39	e 13 38	+21	i 23 29	-47	49.8	56.8
Paris		90.4	30	i 13 40	+22	23 31	-47	37.8	51.4
Eskdalemuir		90.7	30	e 13 40	+20	i 23 35	-46	38.8	46.4
Edinburgh		91.5	41	13 44?	+20	23 39	-50	38.8	—
Besançon		91.7	43	13 50	+25	23 38	-54	38.6	58.2
Moncalieri		92.0	29	i 17 22	?PR ₁	i 23 37	-58	—	—
Dyce		92.1	37	e 13 15	-13	i 23 42	-54	40.8	53.7
Uccle		93.2	36	e 14 0	+27	i 23 48	-59	e 46.8	54.6
De Bilt		93.2	40	e 13 25	-8	23 48	-59	e 38.8	53.0
Strasbourg		93.2	42	e 13 27	-6	i 23 48	-59	—	—
Zurich		93.8	48	i 13 24	-13	23 52	-62	e 46.4	—
Rocca di Papa	E.	93.8	48	i 13 35	-2	—	-62	e 44.2	—
	N.	94.6	44	13 17	-24	23 52	-70	50.0	—
Padova		94.8	49	15 45	+123	23 55	-69	60.8	—
Pompei	E.	95.7	45	e 13 27	-20	e 24 12	-61	40.8?	56.6
Pola		96.4	36	e 13 41	-10	i 24 7	-73	e 46.8	56.8
Hamburg		98.3	222	e 13 3	-59	i 23 39	-120	—	45.6
Wellington		98.4	41	17 16	?PR ₁	i 24 10	-90	e 32.2	57.8
Vienna		99.9	43	e 17 33	?PR ₁	e 24 1	-114	e 31.8	—
Budapest		100.1	46	e 16 8	+117	24 34	-83	e 32.3	—
Belgrade		100.7	54	e 14 15	+1	i 24 23	-99	e 50.8	59.1
Athens		105.0	63	18 9	?PR ₁	—	—	—	—
Helwan		117.2	215	19 22	?PR ₁	e 28 58	+30	47.8	56.5
Riverview		130.0	183	11 35	?	—	—	—	—
Perth		143.8	98	22 39	?PR ₁	—	—	36.4	37.6
Kodalkanal		144.2	61	e 41 33	?SR ₁	—	—	—	—
Simla		144.9	103	19 45	[-3]	29 33	?	43.0	44.6
Colombo		148.4	317	e 19 27	[-26]	20 4	?	—	—
Mizusawa	E.								

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	151.2	313	e 19 27	[-30]	—	—	—	25.0
Batavia	154.8	163	e 19 55	[-7]	i 23 51	?	i 43.1	—
Calcutta	E. 155.5	75	19 51	[-11]	32 51	?	44.8	—
Zi-ka-wei	165.2	334	e 20 13	+ 1]	—	—	—	—
Taihoku	170.1	316	e 19 45	[-30]	—	—	—	—
Manila	172.5	244	18 45	[-91]	—	—	—	—
Hong Kong	175.7	358	20 11	[-6]	—	—	—	—

Additional readings and notes: La Paz gives also iSN = +1m.38s. George-town iz = +10m.25s., iN = +10m.29s., eLZ? = +24.4m. Ithaca i = +10m.56s., e = +15m.15s., and i = +19m.31s. Toronto SR₁ = +23m.21s., SR₂ = +27m.33s., iL = +29.2m. Ottawa iN = +11m.6s., PR₁NV? = +13m.27s., i = +20m.7s. and +21m.14s., SR₁? = +24m.13s., SR₂? = +26m.35s., T₀ = 6h.3m.15s. Berkeley i = +22m.18s. San Fernando MN = +55.2m. Coimbra iN = +22m.30s. and +23m.22s., T₀ = 6h.3m.13s. Victoria S = +14m.41s. (?PR₁), iL = +21.1m. Barcelona MN = +24.7m. Oxford PR₁ = +16m.43s. Stonyhurst S = +16m.45s. Paris PR₁ = 17m.29s., Eskdalemuir eE? = +13m.20s., e = +16m.52s., iE = +17m.41s., MN = +50.5m. Moncalieri MN = +53.2m. Uccle PR₁ = +16m.56s., SR₁ = +29m.19s. De Bilt ePR₁ = +17m.10s., MN = +54.8m. Strasbourg MN = +64.1m. Rocca di Papa ePN = +13m.18s., PR₁E = +16m.39s., PR₁N = +16m.45s. Padova PR₁ = +19m.35s., SR₁N = +25m.2s. and SR₁E = +27m.7s. Pola PR₁ = +17m.41s., MN = +58.7m. Hamburg PR₁ = +17m.39s., iSN = +24m.9s., IPSE = +25m.5s. Wellington ePR₁ = +17m.39s., SR₂ = +44m.39s., T₀ = 6h.3m.26s. Vienna iZ = +17m.55s., iE = +25m.11s., iN = +25m.13s., SR₁N = +27m.38s., SR₁E = +27m.46s., MN = +56.2m. Belgrade ePE = +17m.5s., iPE = +18m.8s., PR₁N = +18m.21s., PR₁E = +19m.36s., PR₁N = +23m.24s., SR₁E = +25m.1s., SR₂E = 25m.35s., SR₂E = +27m.18s. Athens PR₁E = +18m.13s., eN = +18m.21s., i = +25m.27s. Lemberg ($\Delta = 103^{\circ}7'$) gives just 6h. Helwan PN = +19m.21s. Riverview MN = +58.8m. Mizusawa PN = +19m.37s. Batavia i = +21m.38s.

Oct. 20d. 10h. 35m. 20s. Epicentre 0° 5'S. 152° 0'E. (as on 1918 May 20d.).

A = - .883, B = + .470, C = - .009; D = + .470, E = + .883;
G = + .008, H = - .004, K = - 1.000.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	33.3	181	e 6 53	- 6	(e 12 52)	+23	12.9	16.8
Sydney	33.3	181	10 58	?	13 28	+59	14.9	16.7
Manila	34.1	298	e 7 40	+34	—	—	—	—
Adelaide	36.6	198	i 11 28	?	e 15 4	+106	—	18.7
Melbourne	37.9	190	—	?	(14 4)	+27	16.6	19.3
Taihoku	39.0	314	—	—	e 13 50	- 2	—	—
Zi-ka-wei	43.0	323	—	—	e 14 53	+ 5	—	—
Hong Kong	43.3	307	8 15	- 5	(14 40)	-12	14.7	—
Batavia	45.4	262	e 8 39	+ 3	—	—	—	—
Wellington	45.7	155	—	—	e 14 22	-62	e 19.6	22.7
Perth	46.4	225	—	—	18 5	?SR ₁	24.0	—
Victoria	86.9	42	—	—	—	—	39.2	47.5
Helwan	116.5	302	36 40	?SR ₁	—	—	—	—
Toronto	117.3	38	—	—	—	—	e 75.4	77.4
De Bilt	121.4	337	—	—	e 37 40	?SR ₁	e 62.7	67.0
Eskdalemuir	121.6	343	—	—	—	—	64.7	—
Uccle	122.7	336	—	—	—	—	e 61.7	72.7
Paris	125.0	335	—	—	—	—	e 65.7	77.7
Moncalieri	125.5	329	—	—	—	—	e 60.1	—

Additional readings and notes: Riverview gives eS = +10m.41s. and +11m.29s., MN = +18.9m., MZ = +21.7m. Melbourne gives S as SR₁, also eS = +11m.46s., SR₂? = +15m.34s. Hong Kong readings are given as at 11h. Perth PR₁ = +13m.6s., SR₁ = +20m.59s. Helwan PN = +35m.40s. De Bilt MN = +66.4m.

Oct. 20d. Readings also at 0h. (Hong Kong), 2h. (La Paz), 19h. (near Tokyo and Mizusawa), 23h. (Riverview).

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Oct. 21d. 2h. 6m. 10s. Epicentre 41°·0N. 21°·5E. (as on 1921 Aug. 11d.).

A = +·702, B = +·277, C = +·656; D = +·366, E = -·930;
G = +·610, H = +·240, K = -·755.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·3	150	0 44	- 8	1 18	-13	1·4	1·8
Mostar	3·6	313	0 31	-25	i 1 47	?L	(i 1·8)	2·1
Sarajevo	3·7	322	i 1 16	?S	(i 1 16)	-26	(2·3)	2·5
Belgrade	E. 3·0	349	e 1 6	+ 5	i 2 30	?L	(i 2·5)	3·9
	N. 3·9	349	e 1 5	+ 4	i 2 23	?E	(i 2·4)	3·0
Pompeii	5·3	270	2 17	?S	(2 17)	- 8	—	—
Rocca di Papa	6·7	280	e 1 32	-10	i 3 7	+ 5	—	5·3
Pola	6·8	307	e 2 0	+16	—	—	4·1	4·4
Vienna	8·1	335	2 11	+ 8	—	—	4·8	6·3
Padova	8·3	306	2 25	+19	5 16	?L	6·4	—
Lemberg	9·0	10	—	—	—	—	e 10·1	10·9
Moncalieri	10·8	296	—	—	4 54	+ 4	7·2	—
Zurich	11·2	309	e 2 54	+ 7	e 6 18	?L	(e 6·3)	—
Strasbourg	12·3	312	—	—	e 4 55	-31	e 7·0	—
Besangon	12·7	305	7 33	?L	—	—	(7·6)	7·8
Helwan	E. 13·7	141	8 50	?L	—	—	(8·8)	—
Hamburg	14·8	332	—	—	—	—	e 7·8	—
Uccle	15·4	316	—	—	e 6 44	+ 3	e 8·8	—
Paris	15·6	307	—	—	—	—	e 8·5	11·8
De Bilt	15·8	320	—	—	—	—	e 8·1	10·9
Kew	18·2	312	—	—	—	—	—	12·8
Eskdalemuir	21·7	320	—	—	—	—	13·8	—

Additional readings: Athens gives also MN = +1·9m. Mostar iP = 1m.1s., MN = +1m.9s. Sarajevo P = +2m.4s. Belgrade iPN = +1m.7s., and 1m.22s., iPE = +1m.14s. Rocca di Papa iP = +1m.40s. Pola MN = +4·8m. Padova SR,E = +5m.25s., SR,N = +6m.24s. Moncalieri eP = 2h.6m.3s. Helwan PN = +7m.50s. De Bilt MN = +10·8m.

Oct. 21d. 22h. 20m. 54s. Epicentre 46°·5N. 28°·3W. (as on 1918 Nov. 25d.).

A = +·606, B = -·326, C = +·725; D = -·474, E = -·880;
G = +·639, H = -·344, K = -·688.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Stonyhurst	18·0	56	e 9 6	?L	—	—	(e 9·1)	10·6
Edinburgh	18·2	50	—	—	—	—	—	10·1
Oxford	18·3	63	e 4 20	- 1	—	—	9·0	10·6
Paris	20·7	72	e 4 50	+ 1	—	—	—	10·1
Tortosa	21·5	95	5 1	+ 2	8 55	0	11·0	13·4
Uccle	21·8	67	e 5 2	- 1	e 8 57	- 4	e 10·1	—
De Bilt	22·3	63	—	—	e 9 12	+ 1	e 11·1	13·2
Marseilles	23·9	85	—	—	—	—	15·1	—
Strasbourg	24·2	72	e 5 28	- 2	—	—	e 12·1	—

De Bilt gives also MN = +12·4m.

Oct. 21d. Readings also at 3h. (near Lick), 16h. (Colombo).

Oct. 22d. 21h. 18m. 50s. Epicentre 34°·0N. 4°·0E.

A = +·827, B = +·058, C = +·559.

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Algiers	2·9	i 0 46	+ 1	—	—	1·0	1·2
Granada	6·9	1 44	- 1	3 4	- 3	—	—
Tortosa	7·3	1 53	+ 2	—	—	—	6·8
Helwan	E. 23·5	19 10	?L	—	—	—	19·2

Helwan gives also PN = +16m.10s. The readings are probably of some other shock.

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Oct. 22d. Readings also at 0h. (near Algiers), 2h. (Barcelona), 4h. (Vienna and Belgrade), 7h. (near Oaxaca), 21h. and 22h. (near Tacubaya), 23h. (near Ootomari).

Oct. 23d. 12h. 33m. 36s. Epicentre 37°-5N. 9°-0W.

A = +.784, B = -.124, C = +.609; D = -.156, E = -.988;
G = +.601, H = -.095, K = -.793.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
San Fernando	2.5	115	0 45	+ 6	1 41	+32	2.1	2.3
Coimbra	2.7	9	0 43	+ 1	1 15	+ 1	1.6	—
Granada	4.3	93	1 7	0	1 57	- 1	—	—
Tortosa	8.1	63	3 31	?S	(3 31)	- 9	4.5	4.8
Barcelona	9.4	62	—	—	—	—	e 5.1	—

No additional readings.

Oct. 23d. Readings also at 3h. (near Zi-ka-wei), 4h. (La Paz and near Tokyo), 5h. (Helwan), 6h. and 11h. (Manila), 17h. (Tifis (2)).

Oct. 24d. Readings at 0h. (Rio de Janeiro and Helwan), 2h. (Vienna, Riverview, and near Mizusawa), 4h. and 11h. (Taihoku), 13h. (Helwan), 14h. (near Athens), 23h. (Lick and near Batavia).

Oct. 25d. 0h. 47m. 30s. Epicentre 27°-0S. 72°-0W. (as on 1919 Feb. 20d.).

A = +.275, B = -.847, C = -.454; D = -.951, E = -.309;
G = -.140, H = +.432, K = -.891.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz	11.1	—	—	—	—	—	5.4	7.5
Victoria	88.3	330	e 2 44	- 2	—	—	35.7	49.0
Stonyhurst	100.5	34	e 38 30	?L	—	—	(e 38.5)	60.5
Eskdalemuir	100.9	33	—	—	—	—	49.5	—
Edinburgh	101.2	32	—	—	—	—	54.5	—
Uccle	102.7	40	—	—	—	—	—	54.5
De Bilt	103.7	40	—	—	—	—	e 54.5	58.9
Hamburg	106.9	38	—	—	—	—	e 58.5	—
Helwan	113.8	67	27 30	?S	(27 30)	-30	—	—

De Bilt gives also MN = +59.8m.

Oct. 25d. 15h. 4m. 25s. Epicentre 37°-0N. 20°-5E. (as on 1920 June 12d.).

A = +.748, B = +.280, C = +.602; D = +.350, E = -.937;
G = +.564, H = +.211, K = -.799.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	2.8	69	e 0 43	- 1	1 15	- 2	1.3	1.6
Pompeii	5.9	311	e 2 57	?L	—	—	(e 3.0)	—
Sarajevo	7.0	348	e 1 28	-18	2 44	-26	—	3.3
Rocca di Papa	7.6	311	e 1 59	+ 4	3 35	+ 9	—	—
Belgrade	7.8	0	e 1 16	-42	i 2 22	-69	—	2.4
Pola	9.2	330	2 35	+16	—	—	—	—
Budapest	10.5	355	—	—	e 4 20	-23	—	5.2
Vienna	11.6	346	e 3 9	+16	—	—	e 5.7	6.2
Helwan	11.6	125	11 35	?	—	—	—	—
Lemberg	13.1	10	—	—	e 5 23	-23	—	6.6
Strasbourg	14.9	326	—	—	e 6 23	- 7	—	—
Paris	17.6	318	e 4 5	- 7	—	—	e 8.6	8.6
Uccle	18.0	325	—	—	—	—	e 9.2	—
Hamburg	18.1	340	—	—	e 7 35	- 7	—	9.6

Additional readings and notes: Athens gives also ePN = +0m.41s. Rocca di Papa PR₁ = +4m.17s. Sarajevo P = +1m.49s. Belgrade eP = +1m.44s. These readings are given as 5hrs. Paris e has been increased by 10m. and entered as P.

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Oct. 25d. 15h. 45m. 25s. Epicentre 7°-0N. 82°-5W. (as on 1921 Mar. 12d.).

A = +.130, B = -.984, C = +.122; D = -.991, E = -.131;
G = +.016, H = -.121, K = -.992.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights	E.	3.5	55	1 3	+ 8	1 49	+12	2.4	2.9
	N.	3.5	55	1 2	+ 7	1 46	+ 9	2.3	2.4
Vera Cruz		18.0	314	4 22	+ 5	8 59	?L	10.7	12.5
Tacubaya		20.4	309	4 46	0	8 57	+25	11.0	12.2
La Paz		27.4	149	e 5 54	- 8	e 12 21	+93	15.0	19.4
Georgetown	E.	32.3	8					17.2	
Chicago		35.1	353	14 55	?SR ₁			19.2	
Toronto		36.7	4					e 19.4	21.6
Victoria		53.2	330					26.5	33.4
Uccle		82.6	40			e 22 35	-18	e 36.6	
De Bilt	E.	83.0	40					e 38.6	44.5
	N.	83.0	40					e 36.6	45.1
Helwan	E.	106.8	56	64 35	?L			(64.6)	

No additional readings.

Oct. 25d. Readings also at 0h. and 3h. (near Tokyo), 5h. (Perth), 15h. (near Tokyo and Mizusawa), 20h. (near Zurich), 21h. (La Paz, Helwan, and De Bilt), 22h. (Uccle).

Oct. 26d. 7h. 5m. 35s. (I) } Epicentre 25°-0N. 68°-0E. (as on 1920 July 10d.).
23h. 2m. 40s. (II) }

A = +.340, B = +.840, C = +.423; D = +.927, E = -.375;
G = +.153, H = +.392, K = -.906.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Bombay		7.6	143	1 43	-12	3 6	-20	4.7	3.8
II		7.6	143			2 52	-34		3.9
I Simla		10.2	51	e 4 31	?S	(e 4 31)	- 4	e 5.4	
II		10.2	51	e 4 20	?S	(e 4 20)	-15	e 5.2	
I Kodaikanal		17.3	147	6 55	?S	(6 55)	-30		
II		17.3	147	7 2	?S	(7 2)	-23		
I Calcutta		18.8	94	7 31	?S	(7 31)	-27	9.2	
II		18.8	94	8 14	?S	(8 14)	+16	9.7	
I Colombo		21.4	146	9 13	?S	(9 13)	+20	11.4	13.8
II		21.4	146	9 20	?S	(9 20)	+27	11.8	12.5
I Taihoku		48.2	73			e 14 6	-110		
II Hamburg		51.7	320					e 32.3	34.3
I De Bilt	E.	54.0	317					e 35.4	38.2
	N.	54.0	317					e 35.4	36.8
II	E.	54.0	317					e 35.3	37.8
	N.	54.0	317					e 33.3	36.7
I Kew		57.3	317						40.4
I Edinburgh		59.0	320						37.4
I Eskdalemuir		59.1	320					34.4	

No additional readings.

Oct. 26d. Readings also at 0h. (De Bilt, Lick, Berkeley (2), and Victoria), 1h. and 2h. (Apia), 4h. (La Paz), 17h. (near Balboa Heights), 19h. (near Simla and near Vera Cruz and Tacubaya), 21h. (Apia).

Oct. 27d. Readings at 5h. (near Tacubaya), 6h. (Tiflis), 10h. (Azores), 19h. (Apia).

Oct. 28d. Readings at 4h. (Manila), 6h. (near Manila and near Tokyo), 7h. (Tiflis), 8h. (Azores), 13h. (Sydney).

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Oct. 29d. Readings at 1h. (Taihoku and La Paz), 2h. (Mizusawa), 3h. (Rio de Janeiro), 4h. (Mizusawa), 10h. and 12h. (near Tacubaya), 22h. (Azores).

Oct. 30d. Readings at 6h. (La Paz), 7h. (Manila and Batavia and near Tacubaya), 9h. (near Port au Prince and Porto Rico and near Mizusawa), 22h. (La Paz).

Oct. 31d. Readings at 0h. (La Paz, Helwan, Uccle, and De Bilt), 4h. (Algiers), 9h. (near Mizusawa), 10h. (near Batavia), 16h. and 22h. (near Tokyo), 23h. (near Tacubaya, Vera Cruz, Colima, and near Tokyo).

Nov. 1d. Readings at 1h. (Helwan), 2h. and 3h. (near Colima), 8h. (Helwan), 15h. (Belgrade), 19h. (La Paz), 21h. (near Apia), 23h. (near Marseilles),

Nov. 2d. 3h. 38m. 0s. Epicentre 17°-0N. 99°-0W. (as on 1920 Oct. 1d.).

A = -·150, B = -·945, C = +·292 ; D = -·988, E = +·156 ;
G = -·046, H = -·289, K = -·956.

	Δ e	Az. o	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Oaxaca	2·1	90	0 0	-33	—	—	0·3	0·4
Puebla	2·2	20	1 6	?S	(1 6)	+ 6	1·7	1·9
Tacubaya	2·4	356	0 53	+16	—	—	1·4	2·2
Vera Cruz	3·5	51	1 3	+ 8	—	—	1·9	2·1
Mazatlan	9·3	313	—	—	—	—	—	4·3
Tucson N.	18·7	327	4 28	+ 3	8 5	+10	10·0	12·7
Chicago	26·7	19	5 40	-15	10 29	- 6	14·0	—
Ann Arbor N.	28·5	24	11 18	?S	(11 18)	+10	18·0	—
Lick N.	28·5	320	—	—	—	—	e 16·0	—
Georgetown	29·1	37	—	—	—	—	e 19·0	—
Berkeley	29·2	320	e 5 42	-38	—	—	e 14·5	16·3
Toronto	31·4	23	—	—	—	—	i 23·1	26·3
Victoria	37·2	333	—	—	—	—	17·2	24·0
La Paz	45·2	136	8 25	- 9	e 15 39	+21	22·4	25·0
Kew	82·1	39	51 0	?L	—	—	(51·0)	58·0
Paris	84·7	40	—	—	e 38 0	?L	48·0	—
Uccle	85·0	39	—	—	e 23 18	- 1	e 47·0	—
De Bilt	85·1	37	—	—	e 23 24	+ 4	e 44·0	—

Oaxaca readings are increased by 1min

Berkeley gives also eN = +17m.0s.

Nov. 2d. 7h. 56m. 40s. Epicentre 12°-0S. 78°-5W.

A = +·195, B = -·958, C = -·208 ; D = -·980, E = -·199 ;
G = -·041, H = +·204, K = -·978.

	Δ o	Az. o	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
La Paz	11·0	115	2 44	0	(4 54)	0	4·9	5·3
Rio de Janeiro	35·3	113	e 9 26	?	—	—	17·3	—
Vera Cruz E.	35·7	331	—	—	—	—	22·3	22·8
Tacubaya	37·4	328	(6 45)	-48	(13 38)	+ 8	13·6	21·3?
Chicago	54·4	353	10 0	+25	17 5	- 9	25·5	—
Ithaca	54·5	3	—	—	—	—	34·8	—
Ann Arbor N.	54·5	357	25 20	?L	—	—	(25·3)	33·3
Toronto	55·6	359	—	—	e 18 38	+69	e 29·3	31·9
Victoria	72·2	331	—	—	20 7	-45	28·0	44·2
San Fernando	83·3	50	—	—	—	—	—	51·3
Rio Tinto	83·4	49	22 20	?S	(22 20)	-41	—	52·3
Honolulu E.	84·9	293	—	—	—	—	e 40·3	—
Tortosa	89·7	48	—	—	—	—	e 39·3	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Algiers	90.6	52	e 17 59	?PR ₁	—	—	41.3	55.3
Barcelona	91.0	48	—	—	—	—	40.3	50.8
Eskdalemuir	91.7	34	—	i 24 43	+11	—	40.3	—
Kew	92.2	38	46 20	?L	—	—	(46.3)	58.3
Paris	93.2	40	e 22 20	?PR ₁	—	—	49.3	—
Marselles	93.8	46	—	—	—	e 43.3	—	—
Wellington	94.2	226	—	e 24 2	-56	45.2	47.3	—
Uccle	94.8	39	e 18 20	?PR ₁	e 25 2	- 2	e 40.3	—
Christchurch	95.0	224	24 20	?S	(24 20)	-46	52.3	66.3
De Bilt	E. 95.6	38	—	—	e 26 41	+89	e 42.3	51.7
	N. 95.6	38	—	—	e 25 13	+ 1	e 41.3	44.6
Moncalieri	95.8	45	e 15 16	+88	26 27	+73	42.4	56.1
Pola	100.1	45	—	—	—	—	43.3	—
Riverview	114.2	224	—	—	e 35 20	?SR ₁	e 54.7	60.8
Sydney	114.2	224	28 26	?S	(28 26)	+22	57.1	60.1
Tiflis	122.6	47	e 15 8	-47	—	—	—	16.5
Kodaikanal	156.3	92	75 32	?L	—	—	(75.5)	—

Additional readings: Chicago PR₁ = +11m.57s. Toronto e = +24m.14s., eL = +43.9m. San Fernando MN = +48.3m. Honolulu eN = +36m.20s. Eskdalemuir eE = +24m.20s. Wellington PR₁ = +16m.32s., eSR₁ = +31m.50s., eSR₂ = +37m.32s., L = +70.5m. Christchurch S = +32m.8s. Moncalieri MN = +57.5m. Riverview MN = +61.1m. Sydney L = +36.0m., P = +48m.32s. Tiflis e = +16m.8s.

Nov. 2d. Readings also at 0h. (Lick), 2h. (Tucson, Vera Cruz, Oaxaca (2), Puebla, Tacubaya (2), Mazatlan, and La Paz), 3h. (Victoria, Oaxaca, Tacubaya, and Vera Cruz), 7h. (Colombo and La Paz), 8h. (La Paz and Granada), 9h. (Kodaikanal), 12h. (Tacubaya), 15h. (Ottawa and Algiers), 16h. (Algiers and La Paz), 17h. (Helwan), 19h. (near Tokyo), 20h. (Apia, and Ottawa), 21h. (Riverview), 22h. (Helwan).

Nov. 3d. 17h. 13m. 36s. Epicentre 43°-0N. 6°-5W.

A = +.727, B = -.083, C = +.682; D = -.113, E = -.994;
G = +.678, H = -.077, K = -.731.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tortosa	5.7	110	1 28	0	—	—	3.2	3.9
Granada	6.2	158	1 37	+ 2	2 53	+ 4	—	—
Barcelona	6.6	101	—	—	e 3 31	+31	4.0	—
Besançon	9.8	59	4 12	?S	(4 12)	-11	—	—
Strasbourg	11.4	56	—	—	e 4 48	-16	—	—
Simla	65.1	70	e 20 0	?S	(e 20 0)	+34	—	—

No additional readings.

Nov. 3d. Readings also at 1h. (near Tacubaya), 3h. (Taihoku), 4h. (Hong Kong), 6h. (near Tacubaya, Vera Cruz, and Oaxaca), 7h. (Taihoku), 12h. (near Apia), 13h. (Helwan), 14h. (near Apia), 19h. (La Paz and Rio Tinto), 22h. (Rio Tinto), 23h. (Helwan).

Nov. 4d. Readings at 5h. (near Mizusawa), 11h. (Helwan).

Nov. 5d. Readings at 0h. (Zi-ka-wei), 5h. (Tokyo), 7h. (near La Paz), 12h. (Vienna), 14h. (Strasbourg), 20h. (Rio Tinto, Merida, and Vera Cruz), 21h. (Christchurch (2), Wellington, and Riverview), 22h. (Helwan, Mostar, and Tiflis), 23h. (Tiflis).

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Nov. 6d. 16h. 54m. 50s. Epicentre 18°-08. 173°-0W. (as on 1920 May 26d.).

A = -944, B = -116, C = -309; D = -122, E = +993;
G = +307, H = +038, K = -951.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	4.3	17	1 20	+13	1 56	- 2	—	2.3
Wellington	25.5	202	—	—	—	—	e 13.4	14.2
Riverview	35.7	236	—	—	e 11 52	-74	e 16.2	19.8
Sydney	35.7	236	12 58	?S	(12 58)	- 8	19.3	23.7
Melbourne	41.6	233	—	—	e 14 58	+29	—	35.2
Honolulu	42.0	21	—	—	—	—	e 19.0	—
Victoria	79.8	31	—	—	(22 59)	+38	23.0	40.2
Hong Kong	81.8	297	—	—	—	—	42.2	—
La Paz	98.4	111	—	—	35 1	?SR ₁	49.4	51.0
Chicago	98.6	49	—	—	—	—	e 46.2	—
Eskdalemuir	141.8	9	—	—	—	—	69.2	—
De Bilt	E. 145.9	2	—	—	—	—	e 85.2	—
Kew	146.0	8	—	—	—	—	—	93.2
Uccle	147.1	4	—	—	—	—	e 75.2	—
Vienna	148.8	349	1 56 5	?L	—	—	(1 56.1)	—
Moncalieri	153.1	359	—	—	e 59 20	?	73.8	86.0
Helwan	E. 154.7	303	44 10	?SR ₁	—	—	—	—
Rio Tinto	156.9	28	84 10	?L	—	—	(84.2)	93.2

Additional readings: Apia gives also MZ = +3.3m. Riverview MN = +18.2m. Chicago L = +53.2m. De Bilt eLN = +88.2m.

Nov. 6d. Readings also at 4h. (near Mostar), 5h. (Riverview), 9h. (2) and 10h. (Christchurch), 14h. (Vera Cruz and Tacubaya), 15h. (Christchurch (2)), 17h. (near Tokyo), 19h. (Hong Kong and Zi-ka-wei).

1921. Nov. 7d. 15h. 59m. 40s. Epicentre 6°-5N. 126°-0E.

(as on 1921 Sept. 22d.).

A = -584, B = +804, C = +113; D = +809, E = +588;
G = -066, H = +092, K = -994.

Several readings of S at European Stations are noteworthy.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	9.5	330	e 2 24	+ 1	4 50	+34	5.4	5.9
Taihoku	19.0	347	e 4 20	—	—	—	7.5	—
Hong Kong	19.5	326	4 26	- 9	—	—	7.9	9.7
Batavia	22.9	237	e 5 22	+ 6	1 9 38	+15	e 15.8	—
Zi-ka-wei	25.0	351	e 5 36	- 2	e 9 48	-15	—	12.4
Hukuoka	27.4	8	6 1	- 1	(11 31)	+43	11.5	—
Kobe	29.4	15	e 5 58	-24	e 9 33	?PR ₁	—	17.8
Osaka	29.5	16	6 35	+12	—	—	—	15.5
Tokyo	31.8	21	e 6 21	-24	—	—	—	—
Tyosil	32.3	23	e 6 32	-19	—	—	e 15.2	14.5
Mito	32.7	22	5 10	-104	—	—	13.1	16.1
Perth	39.6	194	—	—	13 54	- 6	23.5	—
Calcutta	39.7	299	7 50	- 2	17 14	?SR ₁	25.8	—
Colombo	45.9	273	12 20	?	17 20	+113	21.3	21.8
Riverview	46.8	151	e 8 38	- 8	e 15 26	-12	e 22.0	25.8
Sydney	46.9	151	8 32	-14	15 50	+10	24.8	26.4
Melbourne	47.7	160	e 11 8?	?PR ₁	1 16 20	+30	19.4	22.1
Kodaikanal	48.2	278	8 56	+ 1	(15 38)	-16	15.6	32.4
Bombay	53.2	289	17 33	?S	(17 33)	+34	—	30.8
Apia	65.0	109	—	—	—	—	30.3	—
Wellington	65.4	141	e 11 20	+33	19 56	+26	33.3	37.3
Honolulu	E. 74.7	69	11 52	+ 5	21 3	-19	34.6	34.8
Tiflis	79.1	313	—	—	e 23 20	+67	36.3	49.3
Helwan	E. 90.8	300	13 20	0	—	—	—	—
Belgrade	96.3	317	e 14 46	+55	e 24 1	-78	e 45.1	61.9
Budapest	96.4	319	e 3 50	??	e 18 20	?PR ₁	e 46.3	—
Vienna	97.9	320	—	—	—	—	e 47.3	59.6
Victoria	98.6	40	13 16	-47	21 9	?	31.0	51.1
Hamburg	99.7	327	e 18 20	?PR ₁	e 24 44	-69	46.3	60.1
Pola	100.7	319	24 20?	?S	(24 20?)	-102	e 52.3?	64.4
Strasbourg	102.4	321	e 13 20	-62	26 10	- 9	e 49.3	61.5

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Rocca di Papa	102.6	315	e 22 14	?	25 14	-66	e 50.2	65.2
Berkeley z.	102.8	49	e 18 3	?PR ₁	—	—	e 47.1	48.7
De Bilt e.	102.9	327	—	—	—	—	e 49.3	60.0
N.	102.9	327	—	—	—	—	e 47.3	55.5
Dyce N.	103.7	334	25 32	?S	(25 32)	-58	e 48.3	55.0
Uccle	104.0	326	—	—	—	—	e 48.3	61.2
Moncalieri	104.6	320	e 18 10	?PR ₁	27 47	+69	e 48.9	63.4
Besançon	104.8	321	12 49?	-104	26 27	-13	e 53.3	—
Edinburgh	105.0	333	—	—	e 42 20	?	e 45.3	65.8
Eskdalemuir	105.4	333	e 14 19	-17	e 26 5	-41	e 47.3	65.8
Kew	106.1	328	25 20	?S	(25 20)	-93	—	68.3
Paris	106.1	324	e 19 6	?PR ₁	e 26 37	-16	e 49.3	56.3
Oxford E.	106.4	328	—	—	28 27	+91	e 51.3	64.8
Marseilles	106.9	320	—	—	—	—	e 49.3	—
Cape Town	108.1	235	25 11	?S	(25 11)	-120	—	—
Barcelona	109.9	319	—	—	e 34 44	?SR ₁	e 52.9	66.0
Tortosa	111.2	319	—	—	—	—	e 51.3	73.6
Algiers	111.4	313	—	—	—	—	e 57.3	72.3
Granada	115.9	316	19 34	?PR ₁	31 16	+179	—	—
San Fernando	118.0	318	21 8	?PR ₁	30 26	+112	—	76.3
Chicago	122.8	29	—	—	29 50	+40	e 36.8	—
Toronto	124.9	20	—	—	e 27 8	-137	e 64.6	92.8
La Paz	162.9	127	i 20 12	[+ 2]	34 50	?	e 74.5	82.4

Additional readings: Manila gives also MN = +5.6m. Batavia iP = +5m.24s., i = +5m.41s., and +12m.20s., e = +16m.31s. Zi-ka-wei iPSN = +10m.25s., MN = +15.0m. Kobe MN = +15.3m. Osaka MN = +14.0m. Perth PR₁ = +9m.43s. Riverview eP = +9m.1s., PS = +15m.42s., eSR₁ = +18m.38s. and +19m.2s., MZ = +28.5m., MN = +28.6m. Sydney SR₁ = +18m.50s. Wellington ePR₁ = +14m.44s., SR₁ = +24m.38s. Honolulu SN = +21m.8s. Tiflis MN = +41.3m. Belgrade PR₁ = +17m.49s., PR₂ = +19m.11s., SR₁ = +26m.5s., L = +57.8m. Hamburg MN = +57.6m., MZ = +58.7m. Pola eS = +35m.20s.? MN = +64.1m. Strasbourg MN = +56.8m. De Bilt ePR₁ = +18m.24s. Epicentre 6° 2N, 127° 2E. Dyce SN = +33m.32s. (?SR₁), Uccle MN = +57.4m. Moncalieri MN = +66.8m. Eskdalemuir ePR₁N = +18m.37s., MN = +56.5m. Paris eSN = +26m.31s. San Fernando MN = +80.3m. Toronto e = +33m.26s. (?SR₁), eL = +66.1m., +80.0m. and +90.8m., eL? = +100.6m. La Paz L. rep. $\frac{5}{8}$ +98.5m.

Nov. 7d. Readings also at 3h. (Vera Cruz and near Tacubaya), 4h. (near Mizusawa), 5h. (Taihoku, Ottawa, and near Mizusawa), 6h. (Taihoku and near Mizusawa), 8h. (La Paz), 16h. (near Tokyo and Mizusawa (2)).

Nov. 8d. Readings at 0h. (Taihoku), 2h. (Belgrade), 4h. (Ottawa), 10h. (Manila), 11h. (Christchurch), 15h. (Batavia), 16h. (Dehra Dun and Adelaide).

Nov. 9d. Readings at 0h. and 1h. (Taihoku), 2h. (near Manila), 12h. (near Port au Prince), 14h. (near La Paz), 17h. (near Mizusawa), 18h. (Helwan), 23h. (near Mizusawa).

Nov. 10d. Readings at 0h. (La Paz), 7h. (near Port au Prince), 9h. (Vera Cruz and near Tacubaya), 16h. (Batavia), 19h. (De Bilt, Hamburg, Helwan, Tiflis, and near Mizusawa).

Nov. 11d. 1h. 18m. 45s. Epicentre 34° 2N. 77° 5E. (as on 1917 May 9d.).

A = +.179, B = +.808, C = +.562; D = +.976, E = -.216; G = +.122, H = +.549, K = -.827.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Simla	3.1	185	e 0 45	- 4	—	—	e 1.6	—
Dehra Dun	3.9	174	1 15	+14	—	—	—	—
Bombay	15.8	197	6 51	?S	(6 51)	+ 1	—	—
Colombo	27.4	175	14 33	?L	—	—	(14.6)	17.4
Helwan E.	39.0	276	20 15	?L	—	—	(20.2)	—
Hamburg	50.2	316	—	—	—	—	e 20.2	30.2
De Bilt N.	53.3	313	—	—	e 20 15	?SR ₁	e 27.2	29.5
Kew	56.7	314	—	—	—	—	—	39.2
Eskdalemuir	57.5	319	—	—	—	—	30.2	—

No additional readings.

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Nov. 11d. 14h. 30m. 12s. Epicentre 51°0N. 179°5W. (as on 1920 Oct. 28d.).

A = -0.629, B = -0.005, C = +0.777; D = -0.009, E = +1.000;
G = -0.777, H = -0.007, K = -0.629.

Very uncertain.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Honolulu	34.1	142	e 15 32	?L	—	—	18.6	18.8
Victoria	35.6	73	—	—	—	—	15.4	23.7
Berkeley	41.7	86	—	—	—	—	e 21.7	24.2
Chicago	60.0	60	10 18	+ 6	18 18	- 5	e 29.0	—
Toronto	62.8	53	—	—	—	—	e 34.3	—
Washington	67.5	56	—	—	—	—	e 41.8	—
De Bilt	76.8	357	—	—	e 27 18	?SR ₁	e 44.8	56.2
Moncalieri	83.8	355	e 18 13	?PR ₁	28 32	?SR ₁	e 40.3	—
Coimbra	88.4	7	—	—	—	—	e 29.8	—
Helwan	94.7	334	25 48	?S	(25 48)	+45	—	—

Additional readings: Honolulu gives also eN = +17m.50s., MN = +19.6m.
Berkeley eZ = +23m.11s. Chicago L = +34.0m. Toronto L = 36.5m.,
eL = +44.1m. De Bilt MN = +53.2m.

1921. Nov. 11d. 18h. 36m. 6s. Epicentre 8°0N. 128°0E.

(As on 1919 Mar. 21d.).

A = -0.610, B = +0.780, C = +0.139; D = +0.788, E = +0.616;
G = -0.086, H = +0.110, K = -0.990.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Manila	9.5	314	e 2 27	+ 4	5 6	+50	5.8	—
Taihoku	18.1	341	4 20	+ 2	7 50	+ 8	10.4	15.3
Hong Kong	19.6	319	4 24	-12	(8 14)	- 1	8.2	10.4
Zi-ka-wei	24.0	346	5 19	- 9	e 9 43	- 1	e 11.6	14.0
Nagasaki	24.8	4	5 34	- 2	—	—	10.4	11.8
Batavia	25.5	237	e 5 40	- 3	e 9 32	-41	—	10.3
Hukuoka	25.7	5	5 51	+ 6	11 17	+61	19.4	24.6
Osaka	27.5	13	6 12	+ 9	11 29	+39	16.4	16.9
Kobe	27.5	13	5 59	- 4	10 47	- 3	14.7	14.6
Tokyo	29.7	20	6 27	+ 2	7 1	?	7.8	8.6
Tyosi	30.1	22	6 42	+13	13 53	?	23.8	23.2
Mito	30.6	20	6 31	- 3	—	—	13.7	23.9
Mizusawa	33.3	19	6 53	- 6	12 26	- 3	—	—
Hakodate	35.6	16	e 7 13	- 5	—	—	—	10.6
Ootomari	40.7	14	7 42	-19	(13 56)	-21	13.9	28.0
Calcutta	40.8	297	2 36	?	—	—	9.1	17.2
Perth	41.6	195	7 51	-17	9 55	?PR ₁	14.1	—
Adelaide	44.1	167	8 30	+ 3	i 14 36	-27	e 22.1	31.8
Riverview	47.2	154	e 8 42	- 6	i 15 30	-14	e 21.9	25.8
Sydney	47.2	154	9 0	+12	15 42	- 2	22.9	26.3
Colombo	47.8	271	9 6	+13	(15 54)	+ 3	15.9	17.4
Melbourne	48.4	161	9 30	+34	14 6	-113	17.0	35.2
Kodaikanal	49.9	277	(9 24)	+18	—	—	9.4	33.0
Dehra Dun	51.7	304	7 54	?	—	—	—	—
Bombay	54.5	288	9 40	+ 4	17 12	- 3	25.4	29.8
Apia	63.6	110	e 10 54	+18	19 22	+14	30.9	36.9
Honolulu	72.3	70	11 49	+17	21 16	+22	34.0	45.9
Tifis	79.7	311	e 11 54	-23	e 22 12	- 8	35.7	40.9
Sitka	86.9	33	—	—	i 23 41	+ 1	42.4	44.6
Helwan	91.7	301	13 30	+ 5	—	—	—	63.8
Vernberg	92.8	321	e 14 0	+29	24 42	- 1	e 50.2	61.5
Victoria	96.1	40	(12 55)	-55	(24 14)	-63	24.2	50.8
Athens	96.1	310	e 14 0	+10	i 24 11	-66	e 38.9	56.7
	96.1	310	—	—	e 24 6	-71	—	54.6
Budapest	96.6	320	e 13 27	-25	23 54	-88	e 43.9	—
Belgrade	96.8	318	e 13 48	- 5	i 24 27	-57	e 31.9	47.2
Vienna	98.0	321	13 42	-18	25 0	-36	e 44.4	49.4
Hamburg	99.4	328	e 13 58	- 9	i 24 40	-70	e 41.9	55.5
Berkeley	100.3	49	14 17	+ 5	25 28	-31	47.5	52.3
Pola	100.9	318	e 14 4	-11	e 24 57	-67	e 43.0	64.1
Lick	100.9	49	e 20 54	?PR ₁	—	—	—	50.9
Pompeii	102.0	315	e 15 54	+94	24 54	-81	43.9	53.9
Padova	102.0	320	14 4	-16	24 55	-80	46.2	68.2
De Bilt	102.7	328	e 14 14	-10	e 24 54	-87	e 45.9	64.3

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Rocca di Papa	E. 102-9	316	i 14 21	- 4	i 24 56	-87	e 33-3	53-7
	N. 102-9	316	i 14 20	- 5	i 25 4	-79	e 34-7	55-1
Strasbourg	103-1	322	e 14 11	-15	e 26 7	-18	e 43-9	64-4
Zurich	103-1	321	e 14 10	-16	e 24 59	-86		
Dyce	103-2	335	18 36	?PR ₁	24 46	-100	43-3	52-7
Uccle	103-8	327	e 14 14	-15	24 54	-97	42-9	65-2
Edinburgh	104-5	333	e 14 6?	-26	25 6	-92	42-9	66-4
Besançon	104-7	323	14 53?	+20	25 7	-92	50-9	
Moncalieri	104-8	321	i 14 11	-22	27 58	+78	40-8	68-4
Eskdalemuir	104-9	333			23 54	-167		
Kew	105-9	330	18 54	?PR ₁				68-9
Paris	105-9	325	e 18 55	?PR ₁	e 25 0	-111	46-9	55-9
Oxford	E. 106-2	330	18 46	?PR ₁	e 25 11	-103	34-4	71-1
Marseilles	107-1	320	e 19 6	?PR ₁	e 29 10	+128	e 48-9	52-8
Barcelona	110-1	319	e 19 7	?PR ₁	28 40	+71	e 46-7	54-1
Cape Town	110-6	236	18 10	[-14]	25 30	-123		26-1
Tortosa	111-4	320	19 24	?PR ₁	29 3	+82	42-4	63-4
Algiers	111-8	314	e 14 25	-41	25 31	-133	44-9	72-9
Granada	116-1	318	e 19 19	?PR ₁	i 30 7	+108		
Coimbra	117-3	323	e 19 59	?PR ₁	29 44	+76	47-0	57-2
Rio Tinto	117-7	320	21 54	?PR ₁				78-9
San Fernando	118-3	319	18 36	[-12]	30 24	+108		81-0
Chicago	120-5	29	20 1	?PR ₁	29 51	+58	e 48-9	
St. Louis	E. 121-4	33	i 19 42	?PR ₁	22 48	?	(77-6)	
Ann Arbor	E. 122-0	25	20 36	?PR ₁	30 48	+104	46-9?	67-9
	N. 122-0	25	20 42	?PR ₁	30 54	+110		67-9
Toronto	122-7	21	14 12	-104	i 23 30	?PR ₁	e 62-9	91-7
Northfield	124-6	15			e 37 54	?SR ₁	79-9	
Ithaca	124-8	20	e 20 42	?PR ₁			68-9	
Georgetown	N. 127-6	22	19 19	[+ 6]	30 26	+42	66-3	
Washington	127-6	22	19 27	[+14]			63-9	
Cheltenham	N. 127-8	22			31 21	+95	58-0	92-5
Vera Cruz	128-7	55	19 41	[+26]				
Port au Prince	146-7	35	e 18 16	[-95]				
Porto Rico	E. 150-7	27			e 48 54	?SR ₁	e 82-2	99-0
La Paz	162-1	120	i 20 19	[+10]	34 37	?	72-5	98-1

Additional readings: Zi-ka-wei gives also iPSN = +10m.11s., PSE = +10m.18s., MN = +15-7m. Batavia iS = +5m.43s., i = +6m.33s., and +10m.4s. Osaka MN = +19-8m. Kobe MN = +20-0m. Tokyo MN = +8-8m. Tyosi MN = +24-4m. Mito MN = +17-8m. Mizusawa PN = +6m.50s. Hakodate MN = +9-0m. Adelaide iPR₁ = +10m.6s., i = +11m.18s., e = +16m.54s. Riverview eP = +9m.10s., PS = +15m.42s., and +16m.19s., iSR = +18m.57s., and +19m.5s., SR₂ = +20m.14s., MZ = +34-9m., MN = +35-4m. Sydney SR₁ = +18m.54s. Colombo S = +11m.6s. (iPR₁). Melbourne SR₁ = +15m.0s. Apla e = +11m.4s. and +11m.26s., PR₁ = +13m.54s., and +16m.9s., MN = +33-9m., T₀ = 18h.36m.44s. Epicentre 1°5S. 128°-0E. Tifis e = +34m.54s. Sitka eN = +24m.7s. Victoria SV = +13m.54s., MV = +41-4m. Athens PR₁ = +17m.36s. Belgrade iP = +13m.55s., PR₁N = +17m.14s. Vienna PR₁N = +17m.48s., PR₂E = +20m.16s., PR₂N = +20m.17s., SN = +25m.9s., MZ = +65-4m. Hamburg MN = +50-0m., MZ = +62-8m. Berkeley iE = +24m.43s. Pola MN = +61-6m. De Bilt ePR₁ = +18m.26s., MN = +55-8m., T₀ = 18h.35m.54s. Strasbourg MN = +56-1m., MZ = +65-4m. Rocca di Papa eP = +14m.6s., iPN = +17m.30s., eLE = +38-1m. Dyce SE = +24m.56s. Uccle P = +14m.22s., PR₁ = +18m.30s., MN = +49-9m., MZ = +65-4m. Edinburgh PR₁ = +19m.3s. Moncalieri MN = +69-4m. Barcelona PR₁ = +25m.29s., MN = +69-4m. Algiers PR₁ = +19m.20s., L = +47-9m. Granada gives its readings as on 12d. San Fernando MN = +79-1m. St. Louis gives L as P of a following shock. Toronto PR₁? = +13m.42s., eL = +49-3m., L = +60-8m. Ithaca eE = +31m.54s., eN = +36m.54s., eE = +37m.54s., eLE = +53-9m., e = +80m.12s. Georgetown eE = +19m.24s., eLE = +51-6m., eLN = +50-5m., LE = +65-4m. Washington L = +75-9m. Cheltenham PR₁N = +21m.33s., eE = +39m.14s. and +44m.3s., ME = +84-6m. La Paz iS = +35m.0s., L? = +66-3m., MN = +89-5m., L (rep.) = +92-2m.

Nov. 11d. Readings also at 2h. (La Paz), 6h. (Manila), 7h. (De Bilt), 16h. (Manila and near Athens), 18h. (Manila), 19h. (Georgetown).

Nov. 12d. Readings at 3h. and 6h. (Ottawa), 12h. (near Nagasaki), 15h. (Sarajevo), 16h. (La Paz), 17h. (La Paz and Colombo), 19h., 20h., and 21h. (La Paz), 23h. (near Batavia).

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Nov. 13d. 8h. 40m. 45s. Epicentre 10°-5N. 71°-0W.

A = +.320, B = -.930, C = +.182; D = -.946, E = -.326.
G = +.059, H = -.172, K = -.983.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Port au Prince	N.E.	8.2	351	2 10	+ 6	3 31	-11	4.8	4.0
	N.W.	8.2	351	—	—	3 30	-12	3.8	7.3
Balboa Heights	E.	8.5	261	2 15	+ 6	3 51	+ 1	5.5	5.9
	N.	8.5	261	2 13	+ 4	3 49	- 1	5.4	6.2
Porto Rico	E.	9.4	35	e 5 17	?L	—	—	8.0	8.6
	N.	9.4	35	e 5 30	?L	—	—	8.2	8.3
Vera Cruz		25.8	293	5 58	+12	—	—	16.5	21.2
La Paz		27.1	174	i 5 55	- 4	i 10 53	+10	13.7	18.4
Tacubaya		28.6	292	6 5	- 9	—	—	17.7	19.7
Cheltenham	E.	28.7	350	—	—	11 30	+18	14.2	14.9
	N.	28.7	350	6 51	+36	11 10	- 2	13.1	13.4
Washington		28.9	350	5 58	-19	11 45	+30	16.6	—
St. Louis	E.	33.0	332	e 7 57	+61	e 12 33	+ 9	14.2	18.0
Ann Arbor	N.	33.7	346	8 15	+73	(12 45)	+ 9	12.8	—
Toronto		34.0	350	—	—	—	—	e 17.0	20.6
Chicago		34.5	339	6 5	-64	12 0	-48	e 15.8	—
Rio de Janeiro	N.	43.1	140	—	—	e 22 39	?L	24.4	—
Berkeley		53.3	310	—	—	—	—	31.5	34.9
Victoria		57.7	322	17 46	?S	(17 46)	- 9	30.1	40.9
Granada		65.7	54	i 10 54	+ 5	—	—	—	—
Eskdalemuir		68.8	35	—	—	—	—	31.2	39.2
Edinburgh		69.0	35	—	—	—	—	—	44.2
Oxford		69.3	39	—	—	—	—	—	35.2
Paris		71.3	41	—	—	—	—	—	33.2
De Bilt		73.2	39	—	—	e 21 16	+12	e 33.2	38.0
Moncallieri		74.7	46	e 15 36	?PR ₁	25 36	?SR ₁	36.8	—
Strasbourg		74.8	42	11 39	- 9	e 12 15	?	—	—
Hamburg		76.3	37	i 11 46	-11	—	—	e 38.2	46.2
Pola		79.0	45	—	—	21 48	-24	—	—

Additional readings: La Paz gives also i = +11m.27s. St. Louis MN = +19.8m. Ann Arbor LE = +12.2m. Toronto iL = +15.6m., eL = +19.6m. Victoria L? = +21m.43s., ?SR₁. De Bilt MN = +34.3m.

Nov. 13d. 13h. 51m. 15s. Epicentre 20°-5N. 141°-5E.

A = -.733, B = +.583, C = +.350; D = +.622, E = +.783;
G = -.274, H = +.218, K = -.937.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Osaka		15.2	340	3 53	+11	(6 46)	+ 9	6.8	8.1
Tyosí		15.2	358	3 37	- 5	6 16	-21	—	—
Kobe		15.3	340	3 52	+ 9	(6 54)	+15	6.9	7.0
Tokyo		15.3	355	i 3 42	- 1	4 43	?	6.2	6.4
Mito		15.9	357	3 45	- 6	(6 45)	- 8	6.8	7.0
Nagasaki		16.1	322	4 7	+14	—	—	7.5	7.5
Hukuoka	N.	16.4	325	4 14	+17	(7 36)	+32	7.6	7.7
Mizusawa	E.	18.6	359	4 16	- 8	7 37	-16	—	—
	N.	18.6	359	4 17	- 7	7 36	-17	—	—
Taihoku		18.9	288	e 4 54	+26	—	—	9.0	—
Manila		20.4	257	e 5 19	+33	—	—	—	—
Zi-ka-wei		21.0	305	i 4 42	-11	e 8 10	-34	—	10.1
Hong Kong		25.5	279	5 48	+ 5	—	—	—	14.2
Otomari		26.2	2	5 23	-27	—	—	9.6	—
Batavia		43.2	235	8 18	- 2	14 52	+ 1	—	—
Sydney		55.1	170	16 45	?S	(16 45)	-37	—	30.8
Riverview		55.1	170	e 10 8	+28	e 17 21	- 1	e 23.0	32.4
Honolulu		56.1	78	—	—	e 16 40	-55	20.8	—
Melbourne		58.4	177	—	—	e 17 33	-31	—	18.6
Hamburg		95.0	334	i 17 17	?PR ₁	—	—	e 50.8	—
Helwan	E.	96.1	306	23 45	?S	(23 45)	-92	—	—
De Bilt		98.1	334	—	—	e 24 57	-40	e 46.8	49.6
Eskdalemuir		98.5	341	—	—	i 24 53	-48	46.8	—
Uccle		99.4	334	—	—	—	—	e 46.8	—

Additional readings: Osaka gives also MN = +6.9m. Batavia iP = +8m.19s., i = +15m.47s. Riverview MN = +29.6m. De Bilt MN = +57.8m. Eskdalemuir e = +31m.38s.

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Nov. 13d. Readings also at 0h. (Riverview), 9h. (Batavia), 11h. (Tacubaya), 12h. (Batavia), 15h. (La Paz (2)), 16h. (Manila), 18h. (Batavia and Riverview), 20h. (Ottawa), 23h. (La Paz and Christchurch).

Nov. 14d. 6h. 51m. 40s. Epicentre 18°-0S. 173°-5E. (as on 1921 Oct. 18d.).

A = -945, B = +108, C = -309; D = +113, E = +994;
G = +307, H = -035, K = -951.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	14.8	76	e 4 55	+79	e 5 58	-29	8.9	—
Riverview	25.5	227	e 5 45	+ 2	e 10 14	+ 1	e 12.5	14.2
Christchurch	25.6	181	e 5 38	- 6	11 2	+48	14.5	17.1
Melbourne	31.8	227	e 8 20	PR ₁	—	—	—	18.1
Adelaide	35.3	234	—	—	—	—	—	20.8
Honolulu	E. 48.3	39	16 32	?S	(16 32)	+34	22.3	24.8
	N. 48.3	39	16 20	?S	(16 20)	+22	22.5	25.2
Perth	53.5	243	—	—	—	—	21.3	—
Batavia	65.9	273	e 10 50	0	18 50	-46	—	—
Berkeley	82.1	46	—	—	—	—	e 38.9	—
Victoria	87.0	37	—	—	(24 31)	+50	24.5	44.3
Kodaikanal	98.9	279	58 56	?L	—	—	(58.9)	—
Chicago	108.4	51	19 1	?PR ₁	28 50	+96	e 44.8	—
Toronto	114.6	49	—	—	—	—	e 63.2	70.8
De Bilt	144.7	348	—	—	—	—	e 81.3	—

Additional readings: Apia gives also another reading at +10m.50s. Riverview eS = +10m.46s., MN = +13.6m. Honolulu S = +20m.10s. Batavia i = +12m.12s.

Nov. 14d. Readings also at 1h. (La Paz), 7h. (Zi-ka-wei, Manila, and Batavia), 8h. (La Paz, Christchurch, and near Tokyo), 12h. (Riverview and near Mizusawa), 15h. (Riverview), 16h. (La Paz), 18h. (near Osaka).

Nov. 15d. 4h. 50m. 3s. Epicentre 35°-3N. 130°-8E.

A = -533, B = +618, C = +578.

	Δ	P.	O-C.	S.	O-C.	L.	ME	MN
	°	m. s.	s.	m. s.	s.	m.	m.	m.
Hukuoka	1.7	0 7	-19	—	—	0.5	—	0.9
Nagasaki	2.7	0 39	- 3	—	—	1.4	—	—
Kobe	3.6	i 0 56	0	(1 39)	0	1.6	2.7	1.9
Osaka	3.9	1 2	+ 1	(1 50)	+ 3	1.8	3.7	4.7
Kyoto	4.1	e 1 3	- 1	—	—	2.1	2.3	2.1
Zi-ka-wei	8.8	—	—	e 3 59	+ 1	—	—	—

No additional readings.

1921. Nov. 15d. 20h. 36m. 30s. Epicentre 36°-5N. 70°-5E.

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

A depth 0.030 of focus is assumed.

	Corr. for Focus	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Simla	-0.2	7.7	132	i 1 48	- 6	i 2 36	-48	i 3.1	3.1
Dehra Dun	-0.3	8.8	133	2 30	+21	—	—	—	—
Bombay	-1.0	17.7	173	3 56	- 5	7 6	- 5	—	7.3
Tifis	-1.2	20.6	293	5 54	+80	i 9 42	+66	15.5	—
Calcutta	-1.2	20.8	127	4 54	+18	(8 36)	+21	8.6	—
Kodaikanal	-1.8	27.0	165	5 54	+14	—	—	8.9	15.1
Colombo	-2.0	30.8	164	7 0	+44	11 0	-13	12.9	20.5
Helwan	-2.2	33.2	270	6 28	-10	11 38	-13	—	—
	E. -2.2	33.2	270	6 48	+10	—	—	—	23.8
Lemberg	-2.3	35.7	308	i 6 50	-10	i 12 13	-17	e 19.0	19.7
Belgrade	-2.4	38.3	301	i 7 15	- 6	i 12 56	-13	e 23.4	30.5
Hong Kong	-2.5	40.2	100	7 27	- 9	(13 17)	-17	—	—

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	Corr. for Focus	Δ	Az.	P.		O-C.		S.		O-C.		L.	M.
				m.	s.	s.	m.	s.	s.	m.			
Mostar	-2.5	40.3	298	17	19	-17	i 12	56	-39	e 13.3	18.9		
Vienna	-2.5	40.8	307	17	35	-5	(i 13	36)	-6	i 13.6	17.9		
Zi-ka-wei	-2.6	42.1	84	17	42	-9	(e 13	48)	-11	i 16.8	17.6		
Pola	-2.7	42.9	300	18	0	+3	i 14	8	-2	i 17.5	17.9		
Pompeii	R. -2.7	43.2	293	8	10	+11	14	24	+10	51.5	—		
Padova	-2.8	44.2	302	8	1	-5	14	26	-1	—	—		
Rocca di Papa	-2.8	44.3	296	18	6	-1	i 14	19	-9	e 27.3	—		
Hamburg	-2.8	44.5	315	18	5	-4	i 14	26	-5	e 15.4	18.4		
Taihoku	-2.8	44.8	91	8	5	-6	—	—	—	—	—		
Zurich	-2.9	46.1	305	18	15	-5	i 14	46	-5	i 17.7	—		
Strasbourg	-2.9	46.5	309	18	18	-5	i 14	54	-2	e 18.5	20.9		
Moncalieri	-2.9	47.1	302	18	17	-10	i 14	59	-6	22.5	32.1		
De Bilt	-3.0	47.6	312	18	28	-2	i 15	9	-1	e 19.0	19.6		
Besançon	-3.0	47.8	305	8	30	-2	15	11	-1	21.5	—		
Uccle	-3.0	48.2	310	18	33	-1	i 15	18	0	i 20.1	—		
Nagasaki	-3.0	48.2	78	8	29	-5	—	—	—	—	—		
Hukuoka	-3.0	48.3	76	8	32	-3	15	25	+6	19.4	20.5		
Marseilles	-3.1	49.2	300	8	50	+9	i 15	39	+10	e 20.5	—		
Manila	-3.1	49.8	103	e 8	34	-11	—	—	—	—	—		
Paris	-3.1	49.8	309	i 8	45	0	i 15	36	-1	19.5	19.5		
Dyce	-3.2	51.0	320	8	53	0	(15	53)	+2	15.9	21.6		
Kew	-3.2	51.0	312	8	30	-23	—	—	—	—	35.5		
Oxford	-3.2	51.5	313	8	53	-3	16	0	+2	19.7	28.9		
Kobe	-3.2	51.5	74	8	54	-2	—	—	—	—	18.3		
Osaka	-3.2	51.8	74	9	0	+2	17	24	+83	25.1	30.0		
Edinburgh	-3.2	51.8	318	i 8	57	-1	i 16	7	+6	—	21.2		
Eskdalemuir	-3.2	51.9	318	i 9	1	+3	i 16	9	+7	21.5	27.1		
Barcelona	-3.2	52.0	299	i 9	3	+4	i 16	9	+5	e 21.9	—		
Algiers	-3.3	52.9	292	i 9	6	+2	i 16	17	+3	21.5	23.2		
Otomari	-3.3	53.0	57	9	6	+1	—	—	—	—	—		
Hakodate	-3.3	53.2	62	9	3	-3	—	—	—	—	9.2		
Tortosa	-3.3	53.4	299	i 9	12	+4	i 16	21	+1	22.0	22.7		
Mizusawa	-3.4	54.4	66	9	16	+3	16	33	+2	—	—		
Batavia	-3.4	54.6	135	i 9	14	0	—	—	—	e 19.5	—		
Tokyo	-3.4	54.7	70	i 9	12	-3	—	—	—	—	11.1		
Tyosi	-3.4	55.5	68	9	22	+1	17	11	+26	—	—		
Granada	-3.5	57.6	295	i 9	42	+8	i 17	25	+15	—	—		
Rio Tinto	-3.6	59.6	298	10	30	+44	—	—	—	—	23.5		
Coimbra	-3.6	59.9	300	i 9	55	+7	i 17	57	+19	i 28.2	—		
San Fernando	-3.6	59.9	296	10	4	+16	17	42	+4	—	39.3		
Perth	-4.0	80.5	143	11	40	-18	—	—	—	—	—		
Cape Town	-4.1	85.5	221	12	25	-2	21	52	-47	22.6	22.8		
Ottawa	-4.3	92.7	338	13	0	-7	23	11	-45	43.5	—		
Victoria	-4.3	94.3	10	14	23	+87	23	15	-59	e 44.0	45.7		
Toronto	-4.3	95.3	340	—	—	—	23	30	-54	i 43.2	46.4		
Ithaca	-4.3	95.5	337	e 13	0	-22	i 23	23	-63	e 47.5	—		
Ann Arbor	N. -4.4	97.8	342	13	18	-16	23	30	-79	39.5	49.5		
Georgetown	R. -4.4	98.9	336	e 13	30	-11	23	44	-77	44.8	—		
	N. -4.4	98.9	336	e 13	30	-11	i 23	45	-76	65.8	—		
	Z. -4.4	98.9	336	e 13	30	-11	23	30	-91	49.5	—		
Washington	-4.4	98.9	336	14	27	+46	23	44	-77	40.5	—		
Cheltenham	N. -4.4	99.0	336	13	20	-21	—	—	—	27.2	27.3		
Chicago	-4.4	99.2	345	13	28	-14	23	39	-85	e 41.0	—		
Melbourne	-4.4	101.2	130	18	30	?PR ₁	—	—	—	30.7	61.1		
St. Louis	R. -4.5	102.8	346	e 16	24	?	i 24	6	-93	32.2	48.3		
Riverview	-4.5	102.9	124	e 17	37	?PR ₁	e 24	2	-98	e 33.9	63.2		
Sydney	-4.5	102.9	124	12	30	-92	—	—	—	—	33.0		
Berkeley	R. -4.5	104.8	10	e 14	25	+13	25	58	-1	e 45.9	—		
	Z. -4.5	104.8	10	13	57	-15	25	51	-8	—	—		
Honolulu	N. -4.5	108.2	47	18	17	?PR ₁	28	21	?	44.0	45.5		
Tucson	N. —	111.2	1	18	56	?PR ₁	23	52	?	28.4	28.5		
La Paz	—	138.4	290	19	10	[-27]	—	—	—	67.5	81.0		

Additional readings and notes : Tiflis gives also e = +6m.59s. and +9m.31s. Helwan gives Milne-Shaw readings (recorded in the first line) also PR₁ = +7m.20s., Belgrade PR₁N = +8m.2s., PR₁E = +9m.3s., PR₂E = +10m.2s., PR₂N = +10m.4s., PR₂E = +11m.10s., PR₂N = +11m.12s., SR₁E = +14m.51s., SR₁N = +14m.53s., SR₂E = +16m.56s., SR₂N = +16m.57s., SR₂E = +17m.33s., SR₂N = 17m.35s. Hong Kong S is recorded as PR₁. Mostar PR₁ = +8m.6s., SR₁ = +13m.12s. Vienna iZ = +7m.37s., iE = +7m.38s., Zi-ka-wei PME = +9m.38s., eS = +13m.18s., PSE = +13m.48s., PSN = +13m.49s., this is taken to be S in the table, SR₁V = +15m.20s., MN = +17.4m. Pola MN = +17.6m. Padova PR₁ = +8m.9s. Hamburg PR₁ = +10m.25s., MZ = +19.2m., MN = +19.3m.

Notes continued on next page.

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Strasbourg IPE = +8m.18s., IPN = +8m.21s., PR₁V = +10m.13s., PR₁E = +13m.18s., MN = +21.0m. Moncalieri MN = +35.2m. De Bilt MN = +26.3m. Uccle PR₁ = +10m.28s., i = +16m.36s., +17m.59s., +19m.32s., and +20m.4s. (taken as iL). Epicentre 40° 5'N. 69° 9'E. Marselles PR₁ = +10m.51s., SR₁ = +18m.17s. Paris SR₁ = +18m.8s., MN = +21.5m. Dyce IE = +10m.55s. and +11m.53s., iN = +13m.23s., MN = +21.0m. Kobe readings have been increased by 10min. Osaka MN = +31.6m. Edinburgh PR₁ = +11m.2s. Eskdalemuir PR₁ = +11m.3s., T₀ = 20h.36m.33s. Barcelona PR₁? = +9m.51s., PR₁ = +11m.3s., ? = +17m.34s., SR₁ = +18m.27s. Mizusawa SN = +16m.35s. Batavia i = +16m.1s., +17m.21s., and +17m.45s. Coimbra i = +19m.24s., +25m.45s., +28m.12s. (taken as L in the table), and +33m.18s., T₀ = 20h.36m.26s. San Fernando MN = +38.9m. Ottawa PR₁ = +16m.32s., PR₂ = 18m.42s., SR₁ = +29m.23s., SR₂ = +33m.2s., eL = +41.5m. T₀ = 20h.37m.17s. Victoria iSR₁? = +24m.57s. Toronto iSR₁ = +26m.0s., iSR₂ = +31m.18s., e = +36m.30s., iSR₃? = +38m.30s., eL = +54.5m. Ithaca PR₁ = +17m.4s., eN = +19m.0s. Ann Arbor SE = +23m.36s., ME = +43.5m. T₀ = 20h.37m.36s.? Georgetown iEN = +19m.41s., iZ = +19m.30s. (?PR₁). Washington PR₁ = +17m.30s., PR₂ = +20m.38s., L = +50.5m. Cheltenham eN = +16m.30s. and +22m.34s., LE = +26.1m., LN = +23.6m. Chicago PR₁ = +17m.30s., PR₂ = +19m.35s., L = +63.5m. Melbourne SR₁ = +23m.36s., SR₂ = +25m.48s., SR₃ = +27m.54s. St. Louis MN = +47.0m. Riverview e(SR₁) = +26m.39s., e = +32m.27s., and +32m.39s., MN = +62.4m. Berkeley PR₁E = +18m.13s., PR₁Z = +18m.26s. Epicentre 40° 0'N. 70° 0'E. La Paz iP = +19m.17s.

Nov. 15d. Readings also at 2h. (Zi-ka-wei, Batavia, and Manila), 3h. (Helwan and De Bilt), 4h. (La Paz), 6h. (Helwan), 8h. (Georgetown and Nagasaki), 11h. (La Paz), 13h. (Nagasaki, Zi-ka-wei, and near Osaka), 17h. (near Tokyo), 18h. (La Paz), 19h. (Helwan), 20h. (Vera Cruz and Tacubaya), 21h. (La Paz).

Nov. 16d. 13h. 53m. 2s. Epicentre 35° 3'N. 130° 8'E. (as on Nov. 15d.).

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki	2.7	0 42	0	—	—	—	—
Kobe	3.6	2 17	?L	—	—	(2.3)	—
Osaka	3.9	1 46	?S	(1 46)	-1	2.6	3.9
Zi-ka-wei	8.8	e 1 54	-19	—	—	—	—

Nov. 16d. 14h. 38m. 50s. Epicentre 3° 0'N. 122° 0'E. (as on 1920 May 19d.).

A = -529, B = +847, C = +052; D = +848, E = +530;
G = -028, H = +044, K = -999.

Very doubtful.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	11.3	5	—	—	e 4 16	-46	7.4	—
Batavia	17.7	239	—	—	e 6 30	-63	—	—
Hong Kong	20.8	339	4 56	+5	—	—	(9.3)	—
Zi-ka-wei	28.0	2	6 30	+22	e 11 0	+1	—	27.2
Melbourne	46.0	152	—	—	e 17 10	?	—	34.1
Riverview	46.0	146	—	—	e 15 4	-24	e 26.6	31.1
Sydney	46.0	146	16 40	?S	(16 40)	+72	26.6	30.3
Helwan	89.0	300	25 10	?S	(25 10)	+67	—	—
De Bilt	103.7	325	—	—	—	—	e 56.2	—
Uccle	104.6	324	—	—	—	—	e 55.2	—

Additional readings and notes: Hong Kong gives L as alternative P. Zi-ka-wei gives also eP = +7m.4s. Riverview S given as e, also eS = +19m.43s., PS = +20m.0s., MN = +30.4m.

Nov. 16d. Readings also at 4h. (La Paz, Batavia, and near Manila), 5h. (Helwan), 7h. (Tortosa), 9h. (Batavia), 15h. (La Paz (2), and Kodalkanal), 18h. (La Paz).

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Nov. 17d. 7h. 51m. 25s. Epicentre 11°-0N. 127°-0E. (as on 1921 Sept. 28d.).

A = -591, B = +784, C = +191; D = +799, E = +602;
G = -115, H = +152, K = -982.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	6.9	303	e 1 21	-24	3 39	+32	4.3	4.8
Taihoku	14.9	341	—	—	e 6 40	+10	—	—
Hong Kong	16.7	315	3 52	-9	6 55	-16	9.0	—
Zi-ka-wei	20.8	347	e 4 49	-2	e 8 37	-3	—	—
Batavia	26.4	230	1 6 14	+22	1 8 39	-111	—	—
Kodaikanal	48.7	275	26 41	?L	—	—	(26.7)	—
Riverview	50.4	153	e 10 52	+103	e 17 45	+81	e 23.8	30.3
Sydney	50.4	153	14 5	?	—	—	—	—
Helwan	E. 89.4	301	22 35	?S	(22 35)	-92	—	—
Victoria	94.4	40	—	—	—	—	43.8	51.7
De Bilt	99.6	329	—	—	—	—	e 52.6	56.9
Uccle	100.8	327	—	—	—	—	e 51.6	—
La Paz	164.3	112	19 16	[-55]	—	—	25.9	—

Additional readings: Manila gives also MN = +5.6m. Batavia P = +4m.12s., the readings entered being i's. Riverview MN = +30.7m. De Bilt MN = +54.8m.

Nov. 17d. 22h. 12m. 30s. Epicentre 36°-5N. 118°-0W. (as on 1915 Oct. 3d.).

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Lick	3.0	287	i 0 46	-1	i 1 23	0	—	1.5
Berkeley	E. 3.7	294	e 0 59	+1	e 1 44	+2	e 1.8	2.0
	N. 3.7	294	e 1 0	+2	e 1 43	+1	e 1.9	2.2
Tucson	N. 7.3	123	—	—	e 3 7	-11	—	3.7

Berkeley gives also iPN = +1m.9s.

Nov. 17d. Readings also at 4h. and 5h. (Manila), 7h. (Taihoku), 18h. (Barcelona and near Tortosa), 22h. (near Mizusawa and Tokyo).

Nov. 18d. 2h. 33m. 36s. Epicentre 11°-0N. 127°-0E. (as on Nov. 17d.).

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	6.9	303	e 1 41	-4	—	—	4.7	—
Zi-ka-wei	20.8	347	e 4 51	0	e 8 51	+11	—	—
Kodaikanal	48.7	275	30 18	?	—	—	—	—
Riverview	50.4	153	—	—	18 18	+114	e 31.5	35.4
Helwan	E. 89.4	301	57 24	?L	—	—	(57.4)	—
De Bilt	N. 99.6	329	—	—	—	—	e 53.4	56.8
Uccle	100.8	327	—	—	—	—	e 53.4	—

Helwan reading is increased by 1h. De Bilt gives also eLE = +54.4m.

Nov. 18d. Readings also at 2h. (near Mizusawa), 4h. (Helwan), 5h. (Manila), 6h. (Riverview), 7h. (Taihoku), 9h. (Kingston, Mizusawa, and Port au Prince), 16h. (La Paz and near Mostar), 18h. (Budapest), 20h. (near Batavia and near Mostar and Sarajevo).

Nov. 19d. Readings at 2h. (near Taoubaya and Oaxaca), 7h. and 8h. (near Tokyo), 14h. (near Rocca di Papa), 19h. (Batavia), 22h. (Batavia and La Paz).

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Nov. 20d. Readings at 6h. (Taihoku, Manila, Hong Kong, and Zi-ka-wei), 7h. Taihoku, Hong Kong, and Zi-ka-wei), 8h. (Taihoku and La Paz), 11h. (Batavia and Manila), 14h. (Azores), 21h. (Helwan), 23h. (Christchurch).

Nov. 21d. Readings at 0h. (near Nagasaki), 3h. (Tifis), 4h. (near Mizusawa), 11h. (near Sarajevo), 14h. (near La Paz), 17h. (Batavia), 23h. (near Mizusawa).

Nov. 22d. 20h. 7m. 30s. Epicentre 15°·0N. 111°·0E. (as on 1917 Feb. 5d.).

$$A = -\cdot346, B = +\cdot902, C = +\cdot256; \quad D = +\cdot934, E = +\cdot358; \\ G = -\cdot091, H = +\cdot242, K = -\cdot966.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hong Kong	7·9	22	1 51	- 9	3 39	+ 5	4·0	—
Manila	9·6	91	e 4 24	?S	(e 4 24)	+ 6	4·8	—
Zi-ka-wei	18·8	29	e 4 31	+ 4	e 7 45	-13	—	10·2
Batavia	21·6	191	—	—	—	—	e 10·4	—
De Bilt	87·6	324	—	—	—	—	e 45·5	—

Additional readings and notes: Hong Kong gives also PR₁ = +2m.52s. Manila reading is given as at 21h. Zi-ka-wei MN = +10·4m. Batavia e = +6m.49s., +10m.25s. (taken as L), and +12m.10s.

Nov. 22d. Readings also at 4h. (near Tokyo), 9h. (Batavia), 10h. (Hong Kong and Manila), 11h. and 18h. (Tifis), 21h. (La Paz), 22h. (Helwan and De Bilt).

Nov. 23d. Readings at 8h., 11h., and 17h. (Tifis), 19h. (near Tacubaya), 21h. (Hong Kong), 22h. (Helwan and Tacubaya), 23h. (near Colima).

Nov. 24d. Readings at 2h. (Colombo (2) and Batavia), 3h. (La Paz), 8h. (Helwan), 10h. (Nagasaki), 11h. (Toronto and Victoria), 14h. (Helwan, near Mizusawa, and near Sarajevo), 15h. (Riverview), 16h. (Helwan), 18h. (Riverview, Melbourne, Adelaide, and Perth), 19h. (De Bilt), 21h. (Melbourne), 22h. (Taihoku).

Nov. 25d. Readings at 6h. (Kingston, Melbourne, and Riverview), 8h. (Oaxaca, Vera Cruz, and Tacubaya), 12h. and 13h. (Colombo), 14h. (La Paz), 15h. (Taihoku and La Paz), 16h. (Vera Cruz), 17h. (Oaxaca and Merida), 18h. (Batavia (2)), 19h. (Apia and Batavia).

Nov. 26d. Readings at 0h. (near Sarajevo), 5h. (Tifis), 9h. (Taihoku), 12h. (Taihoku and near Sarajevo), 17h. (Tacubaya), 22h. (Batavia).

Nov. 27d. Readings at 0h. (La Paz), 4h. (Simla), 7h. (near Balboa Heights), 9h. (La Paz), 11h. (Zi-ka-wei, Helwan, Taihoku (2), and Hong Kong), 13h. (Taihoku, De Bilt, Hong Kong, and Zi-ka-wei), 19h. (near Simla), 21h. (La Paz).

Nov. 28d. Readings at 1h. (near Mizusawa), 2h. (Manila), 4h. (2), 5h., and 7h. (La Paz), 8h. (Taihoku), 12h. (Puebla), 13h. (Colombo), 14h. (near Oaxaca, Colima, Tacubaya, and Vera Cruz), 18h. (near La Paz and near Mizusawa), 20h. (Helwan).

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Nov. 29d. 2h. 43m. 36s. Epicentre 28°·0N. 130°·0E. (as on 1921 June 23d.).

A = -·568, B = +·676, C = +·470 ; D = +·766, E = +·643 ;
G = -·302, H = +·360, K = -·883.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Zi-ka-wei	8·1	295	—	—	—	—	e 6·1	—
Taihoku	8·1	250	—	—	e 3 52	+12	—	—
Hong Kong	15·4	252	3 44	0	6 16	-25	—	6·9
Manila	15·9	214	e 3 51	0	—	—	6·2	7·5
Colombo	51·9	256	15 24	?S	(15 24)	-79	—	31·4
Helwan	E. 83·2	300	54 24	?L	—	—	(54·4)	—
De Bilt	86·6	329	—	—	—	—	e 50·4	59·2

Manila gives also MN = +6·6m.

Nov. 29d. 4h. 15m. 45s. Epicentre 36°·0N. 141°·0E. (as on 1921 Aug. 22d.).

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	1·1	253	i 0 14	- 3	0 25	- 6	0·7	0·8
Mizusawa	E. 3·1	1	0 41	- 8	1 17	- 9	—	—
	N. 3·1	1	0 34	-15	1 13	-13	—	—
Osaka	4·7	256	1 39	+26	—	—	2·6	4·5
Kobe	5·0	256	—	—	e 2 30	+13	5·2	—
Zi-ka-wei	17·0	259	—	—	—	—	e 8·9	—

Osaka gives also MN = +3·1m.

Nov. 29d. 12h. 4m. 4s. Epicentre 43°·9N. 9°·5E. (as on 1917 April 26d.).

A = +·711, B = +·119, C = +·693.

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Padova	2·3	0 41	+ 5	0 58	- 5	—	—
Pola	3·3	1 32?	?L	—	—	(1·5?)	—
Zurich	3·6	e 1 7	+11	i 1 44	+ 5	—	—
Vienna	Z. 6·5	2 26	?S	(2 26)	-31	i 3·6	5·2

Additional readings: Padova gives also SR₁ = +1m.34s. Zurich ePV = +1m.5s., iSN = +1m.43s.

Nov. 29d. 22h. 46m. 0s. Epicentre 18°·0S. 173°·0W. (as on 1921 Nov. 6d.).

A = -·944, B = -·116, C = -·309 ; D = -·122, E = +·993 ;
G = +·307, H = +·038, K = -·951.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	4·3	17	i 1 14	+ 7	1 57	- 1	2·4	3·0
Riverview	35·7	236	e 7 50	+31	e 12 50	-16	e 16·1	19·6
Berkeley	73·4	40	—	—	—	—	e 31·8	34·5
Victoria	79·8	31	—	—	—	—	37·6	40·0
La Paz	98·4	111	17 58	?PR ₁	e 28 38	?SR ₁	46·8	53·3
Toronto	104·8	48	—	—	—	—	e 57·4	61·8
De Bilt	145·9	2	e 20 30	[+40]	—	—	e 81·0	90·7
Vienna	148·8	349	19 58	[+ 4]	—	—	—	22·5
Strasbourg	149·4	358	20 0	[+ 5]	—	—	—	—
Rocca di Papa	155·7	350	e 20 48	[+45]	—	—	—	28·0

Additional readings: Riverview gives also eP? = +8m.54s., MN = +22·5m.
De Bilt MN = +92·8m. Vienna iZ = +20m.1s. Strasbourg ePE = +20m.4s.

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Nov. 29d. Readings also at 2h. (La Paz), 10h. (Riverview), 11h. (Helwan), 13h. (La Paz), 18h. (Vienna, Melbourne, and Riverview), 19h. (De Bilt), 20h. (Helwan), 21h. (La Paz and Honolulu), 22h. (Helwan).

Nov. 30d. Readings at 1h. (near Tokyo), 3h. (Colombo), 8h. (La Paz), 12h. (3) and 16h. (Tiflis).

Dec. 1d. 10h. 49m. 32s. Epicentre 30° 0'N. 119° 5'E.

A = -426, B = +754, C = +500; D = +870, E = +492;
G = -246, H = +435, K = -866.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Zi-ka-wei	2.1	54	i 1 0	?S	(i 1 0)	+ 2	(e 1.2)	3.5
Taihoku	5.3	157	—	—	e 4 9	?	—	5.1
Hokoto	6.5	180	—	—	4 10	?	—	4.6
Hong Kong	9.0	213	6 16	?	—	—	—	7.2
Nagasaki	9.3	70	2 13	- 7	(3 53)	-17	—	3.9
Kobe	14.0	66	e 3 27	+ 1	—	—	—	15.4
Osaka	14.3	67	—	—	6 15	0	—	7.4
Manila	15.5	175	e 4 58	+72	—	—	—	10.5
Tokyo	17.9	66	e 4 19	+ 3	—	—	—	e 8.4
Simla	36.2	282	20 22	?L	—	—	—	(20.4)
Batavia	38.2	200	e 8 26	+46	i 14 34	+53	—	e 26.9
Colombo	43.8	245	15 52	?S	(15 52)	+53	—	30.5
Helwan	E. 74.2	295	31 28	?L	—	—	—	(31.5)
Vienna	76.0	319	11 54	- 1	21 35	- 2	—	e 37.0
Hamburg	76.7	325	—	—	—	—	—	e 38.5
Pola	79.2	316	22 28	?S	(22 28)	+14	—	42.5?
De Bilt	E. 79.9	325	—	—	e 22 18	- 4	—	39.5
	N. 79.9	325	—	—	e 22 15	- 7	—	45.3
Dyce	79.9	332	—	—	—	—	—	45.6
Strasbourg	80.6	321	—	—	—	—	—	40.4
Uccle	81.1	324	—	—	—	—	—	e 43.4
Florence	81.4	316	36 18	?L	—	—	—	e 38.5
Rocca di Papa	81.6	314	—	—	—	—	—	(36.3)
Eskdalemuir	81.6	331	—	—	—	—	—	e 44.3
Besançon	82.4	320	43 21	?L	e 22 19	-23	—	41.5
Bidston	82.9	329	—	—	—	—	—	(43.4)
Kew	82.9	328	—	—	—	—	—	44.5
Oxford	85.2	328	—	—	—	—	—	47.5
Paris	85.2	323	—	—	e 34 28	?	—	43.2
Tortosa	89.2	318	e 43 47	?L	—	—	—	42.5
Coimbra	94.8	322	37 19	?	—	—	—	e 46.5
San Fernando	E. 96.3	319	—	—	—	—	—	50.0
								56.0

Additional readings and notes: Nagasaki gives also MN = +4.6m. Kobe MN = +9.2m. Osaka MN = +8.4m. Mizusawa ($\Delta = 20^\circ 0' \text{ Az.} = 57^\circ$), PE = 10h.47m.42s., PN = 10h.48m.24s., SE = 10h.53m.49s., SN = 10h.53m.48s. Batavia i = +15m.15s. Vienna IZ = +12m.2s. Pola MN = +44.7m. Strasbourg MN = +44.6m. Eskdalemuir MN = +48.4m. Coimbra LN = +51.7m. San Fernando MN = +56.5m.

Dec. 1d. 17h. 53m. 10s. Epicentre 24° 0'N. 124° 0'E. (as on 1919 Dec. 16d.).

A = -511, B = +757, C = +407; D = +829, E = +559;
G = -228, H = +337, K = -914.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	2.5	294	0 36	- 3	—	—	—	1.0
Hokoto	4.1	275	1 4	0	—	—	—	1.4
Zi-ka-wei	7.5	343	e 1 54	0	e 3 26	+ 2	—	4.5
Hong Kong	9.2	262	4 3	?S	(4 3)	- 5	—	5.6
Helwan	80.4	298	53 50	?L	—	—	—	(53.8)
Hamburg	83.9	327	—	—	—	—	—	e 43.8
De Bilt	87.2	327	—	—	—	—	—	e 46.8
Uccle	88.3	327	—	—	—	—	—	—
Eskdalemuir	88.8	333	—	—	—	—	—	40.8
Stonyhurst	89.5	332	e 57 50	?L	—	—	—	(e 57.8)

Additional readings Zi-ka-wei gives also MN = +4.3m., MZ = +4.4m. De Bilt MN = +56.5m.

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Dec. 1d. Readings also at 5h. (Rocca di Papa), 6h. (near Rocca di Papa and Florence), 7h. (Hong Kong), 12h. (La Paz and Zi-ka-wei), 14h. (Florence), 15h. (near La Paz, near Tokyo, and near Rocca di Papa (2) and Florence (2)), 17h. (near Tokyo and Mizusawa), 18h. (near Mizusawa).

Dec. 2d. 20h. 43m. 8s. Epicentre 20°·6S. 168°·8E. (as on 1920 Sept. 20d.).

A = -·918, B = +·182, C = -·352 : D = +·194, E = +·981 ;
G = +·345, H = -·068, K = -·936.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	19·7	73	—	—	—	—	11·9	—
Riverview	20·5	226	i 4 52	+ 5	8 56	+22 e	10·4	10·8
Melbourne	26·8	225	6 16	+20	10 46	+ 9	13·0	15·5
Adelaide	30·1	235	—	—	e 11 52	+16 e	16·4	19·4
Batavia	61·6	275	e 10 20	- 3	i 18 40	- 3	—	—
Honolulu	E. 53·0	40	—	—	—	—	e 24·9	—
Helwan	E. 140·7	291	89 52	?L	—	—	(89·9)	—

Additional readings: Riverview gives also MN = +11·3m. Batavia i = +13m.40s. (?PR₁).

Dec. 2d. Readings also at 1h. (La Paz), 2h. (La Paz and Helwan), 5h. (Manila), 6h. (Riverview), 8h. (Apia, Christchurch, and Riverview), 10h. (Algiers), 13h. (La Paz), 18h. (Zi-ka-wei and Tifis), 21h. (near Mizusawa).

Dec. 3d. Readings at 5h. (Riverview), 9h. (La Paz and Tifis), 10h. (Helwan), 11h. (Tifis), 13h. (near La Paz), 14h. (Oaxaca, Vera Cruz, and Tacubaya), 15h. (Helwan), 21h. (Riverview), 23h. (Algiers).

Dec. 4d. Readings at 7h. and 9h. (La Paz), 12h. (Batavia and near Mizusawa), 16h. (Taihoku), 17h. (Batavia).

Dec. 5d. Readings at 1h. (near Nagasaki), 2h. (La Paz).

Dec. 6d. 13h. 26m. 16s. Epicentre 40°·0N. 45°·5E.

A = +·537, B = +·546, C = +·642 ; D = +·713, E = -·701 ;
G = +·451, H = +·458, K = -·766.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tifis	1·7	342	0 44	+18	e 0 50	+ 2	0·9	—
Helwan	E. 15·4	233	8 44	?L	—	—	(8·7)	—
Lemberg	18·0	310	—	—	e 7 14	-26 e	9·2	13·3
Vienna	22·3	301	5 9	0	9 11	0 e	13·2	14·2
Pompeii	E. 23·4	282	5 49	+28	—	—	—	—
Pola	23·7	292	—	—	e 9 40	+ 2	—	—
Rocca di Papa	24·7	285	i 5 41	+ 6	9 50	- 7	16·4	19·6
Moncalieri	28·0	293	e 3 29	?	(10 38)	-21	10·6	—
Strasbourg	28·0	300	e 5 44	-24	—	—	e 15·7	—
De Bilt	30·0	307	—	—	e 11 44	+10	14·7	20·5
Uccle	30·3	305	—	—	—	—	—	14·7
Paris	31·5	301	—	—	—	—	17·7	22·7
Stonyhurst	34·7	310	e 16 14	?L	—	—	(e 16·2)	23·7
Dyoe	34·9	316	—	—	—	—	19·7	—

Additional readings: Vienna gives also IZ = +5m.26s. De Bilt MN = +16·1m. Paris reading for L is increased by 20m.

Dec. 6d. Readings also at 1h. (Azores), 12h. (Batavia and La Paz), 13h. (Tifis), 15h. (Vera Cruz).

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Dec. 7d. 17h. 27m. 20s. (I) } Epicentre 2°·1N. 127°·8E. (as on 1921 July 15d.).
 18h. 40m. 40s. (II) }

A = -·612, B = +·790, C = +·037 ; D = +·790, E = +·613 ;
 G = -·022, H = +·029, K = -·999.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Manila	14·2	332	3 40	+11	(6 20)	+ 7	6·3	—
II	14·2	332	3 29	0	—	—	—	—
I Batavia	22·5	248	i 4 56	-15	i 9 1	-14	e 15·7	—
II	22·5	248	i 5 15	+ 4	i 7 48	-37	i 11·0	—
I Taihoku	23·7	346	e 7 12	?	—	—	—	—
I Hong Kong	24·1	328	5 29	0	(9 40)	- 6	9·7	—
II	24·1	328	5 20	- 9	9 5	-41	12·4	—
I Zi-ka-wei	29·7	349	6 25	0	e 11 52	+23	—	17·4
I Osaka	33·3	11	8 23	+84	—	—	—	14·6
I Kobe	33·3	11	e 7 5	+ 6	—	—	—	9·4
I Perth	35·9	197	—	—	12 40	-29	—	—
I Adelaide	38·4	165	—	—	i 13 22	-22	e 19·9	24·7
I Riverview	42·1	150	e 7 43	-29	i 14 30	- 6	e 24·0	28·2
I Sydney	42·1	150	8 34	+22	14 28	- 8	22·5	30·7
I Melbourne	43·0	160	8 58?	+40	15 16	+28	24·9	30·8
I Colombo	48·0	277	8 40	-14	14 10	-94	27·7	33·8
I Kodakamal	50·6	281	9 52	+41	—	—	30·1	33·0
I Helwan	E. 94·5	300	13 40	- 1	—	—	—	—
I Victoria	100·8	40	—	—	—	—	—	64·2
I Hamburg	104·3	327	—	—	e 24 40	-116	e 52·7	54·7
I Pola	105·1	318	—	—	24 40	-123	74·7	—
I Rocca di Papa	106·9	315	—	—	—	—	60·1	—
I Strasbourg	107·6	322	—	—	—	—	—	63·1
I De Bilt	107·6	326	—	—	e 25 14	-112	e 52·7	62·2
II	107·6	326	—	—	—	—	e 55·3	58·1
I Dyce	108·4	334	—	—	—	—	55·5	56·6
I Uccle	108·6	325	—	—	e 28 40	+85	—	54·7
I Besançon	109·3	321	—	—	—	—	62·7	—
I Edinburgh	109·7	334	—	—	—	—	56·7	—
I Eskdalemuir	110·1	333	—	—	e 28 40	+71	53·7	66·7
I Coimbra	121·8	322	e 22 10	?PR ₁	—	—	41·7	—
I La Paz	158·8	134	i 20 27	[+20]	31 24	?	72·3	—

Additional readings: Kobe I gives also MN = +8·9m. Adelaide I i = +16m.34s. Riverview I eSR = +17m.33s. and +17m.57s., MN = +29·5m. Melbourne I SR₁ = +18m.22s. Rocca di Papa I L = +60·5m. De Bilt I MN = +57·7m., II MN = +59·2m. Eskdalemuir I MN = +59·0m.

Dec. 7d. Readings also at 0h. (near Mizusawa), 1h. (Eskdalemuir), 5h. (Tifis), 12h. (Batavia), 13h. (La Paz), 14h. (Apia), 21h. (near Belgrade and Sarajevo), 22h. (Rocca di Papa).

1921. Dec. 8d. 12h. 31m. 24s. Epicentre 36°·0N. 139°·0E.

(As on 1921 Feb. 14d.).

A = -·611, B = +·531, C = +·588 ; D = +·656, E = +·755 ;
 G = -·444, H = +·386, K = -·809.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Numadu	0·2	320	0 30	+26	0 35	+29	0·7	—
Maebasi	0·4	8	0 47	+41	—	—	1·0	—
Tokyo	0·8	118	i 0 15	+ 3	—	—	0·4	—
Tukubasan	0·9	76	0 15	+ 1	—	—	—	0·4
Mito	1·3	72	0 16	- 4	—	—	0·4	—
Tyosi	1·6	120	0 18	- 6	—	—	0·5	—
Gifu	1·9	245	1 2	?S	(1 2)	+ 9	1·5	4·9
Kyoto	2·8	250	1 55	?S	(1 55)	+38	2·6	3·0
Osaka	3·2	248	—	—	1 19	- 9	2·5	3·0
Kobe	3·4	248	—	—	1 22	-12	2·6	2·7
Mizusawa	E. 3·5	28	1 0	+ 5	1 40	+ 3	—	—
	N. 3·5	28	0 58	+ 3	1 41	+ 4	—	—
Akita	3·8	13	1 0	+ 1	—	—	2·0	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	m. s.	s.	m. s.	s.	m.	m.
Hakodate	5.9	12	1 43	+12	—	—	3.0	3.5
Sapporo	7.3	13	1 45	-6	—	—	3.4	—
Hukuoka	7.4	254	2 13	+21	3 43	+22	4.4	4.8
Nagasaki	8.2	250	2 20	+16	—	—	4.1	5.4
Zinsen	10.1	282	(1 54)	-37	1 54	?P	4.4	4.8
Otomari	11.0	14	2 48	+4	(4 39)	-15	4.6	6.6
Zi-ka-wei	15.4	257	i 3 57	+13	e 7 1	+20	—	18.2
Taihoku	18.6	239	e 4 27	+3	—	—	8.4	—
Hong Kong	25.5	244	e 6 23	+40	—	—	—	17.1
Manila	26.8	222	e 4 40	-76	—	—	—	—
Simla	50.9	283	26 54	?L	—	—	(26.9)	—
Batavia	51.9	222	e 9 16	-3	i 16 31	-12	—	—
Honolulu	56.2	87	—	—	—	—	e 24.3	26.6
Kodaikanal	61.1	261	39 54	?S	—	—	41.2	44.0
Colombo	61.2	259	18 36	?S	(18 36)	-2	—	42.6
Victoria	68.5	45	—	—	(19 43)	-25	19.7	48.2
Riverview	70.8	170	e 18 42	?S	e 21 24	+48	—	—
Sydney	70.8	170	20 18	-3	(20 18)	-18	—	42.8
Hamburg	80.2	332	i 12 17	-3	i 22 23	-2	e 42.6	46.2
Dyce	81.3	341	i 13 40	+73	i 22 36	-2	43.6	—
Vienna	81.5	326	i 12 27	-1	—	—	—	23.0
Edinburgh	82.7	340	—	—	—	—	40.6	53.6
Eskdalemuir	83.2	339	i 12 33	-4	i 22 50	-9	40.6	47.0
De Bilt	83.2	333	—	—	e 22 53	-6	e 42.6	52.0
N.	83.2	333	—	—	e 22 55	-4	—	56.7
Uccle	84.5	333	e 12 39	-6	23 2	-12	—	—
Strasbourg	85.0	330	12 42	-6	23 1	-18	e 47.6	58.6
Pola	85.2	325	11 7	?S	e 23 16	-5	45.6?	50.9
Helwan	85.4	304	23 36	?S	(23 36)	+13	—	—
E.	85.6	336	—	—	—	—	—	52.6
Kew	85.7	327	23 15	?S	(23 15)	-12	47.0	56.0
Padova	85.7	338	—	—	23 3	-24	39.9	53.1
Oxford	86.8	330	12 54?	-4	23 16	-23	50.6	—
Besançon	86.8	333	e 12 52	-6	i 23 16	-23	45.6	50.6
Paris	87.8	328	13 9	+5	25 58	+128	34.8	56.9
Moncalieri	87.9	321	24 4	?S	(24 4)	+13	—	—
Pompeii	88.0	323	e 12 42	-23	23 45	-7	e 45.5	50.0
Rocca di Papa	90.3	329	—	—	e 52 36	?L	58.6	—
Marseilles	93.0	27	—	—	—	—	53.4	59.6
Toronto	94.2	330	—	—	—	—	e 51.6	59.1
Tortosa	99.1	331	e 17 58	?PR ₁	i 29 39	?SR ₁	54.8	—
Granada	99.7	333	55 36	?L	—	—	(55.6)	66.6
Rio Tinto	100.7	332	19 36	?PR ₁	—	—	—	65.1
San Fernando	132.0	254	50 40	?L	—	—	(50.7)	—
Cape Town	149.0	58	20 57	[+63]	35 4	?S	71.6	—
La Paz								

Additional readings and notes : Osaka gives also MN = +2.9m. Kobe MN = +3.0m. Hakodate MN = +4.0m. Hukuoka MN = +5.0m. Zinsen gives P = 12h.31m.13s. Otomari MN = +7.8m. Zi-ka-wei SR₁N = +7m.41s., SR₁E = +7m.48s., MN = +9.1m. Hong Kong PR₁ = +8m.57s. or +8m.20s. Batavia e = +13m.45s. Honolulu eN = +23m.14s. Hamburg MZ = +53.6m. Vienna i = +14m.59s. (?PR₁). All readings are given as on 9d. Eskdalemuir PR₁Z? = +15m.48s., MN = +53.2m. Pola MN = +55.6m. Paris MN = +53.6m. Rocca di Papa iP = +12m.54s., PR₁ = +17m.0s., iS = +23m.42s. Toronto eL = +57.2m. San Fernando MN = +70.1m.

Dec. 8d. Readings also at 0h. (Batavia), 4h. (near Sarajevo), 12h. (near Tokyo), 13h. (near Mizusawa (3)), Tokyo (5), and Osaka), 14h. (Stonyhurst, Tifis, and near Tokyo (2)), 16h. (near Mizusawa and Tokyo), 17h. (Stonyhurst and near Tokyo), 18h. (Coimbra and near Tokyo and Mizusawa), 19h. (near Tokyo and Mizusawa), 21h. (La Paz).

Dec. 9d. Readings at 0h. (near Tokyo (2)), 3h. (La Paz), 5h. (Batavia and Tifis), 11h. (Apia, Christchurch, Tifis, and Riverview), 12h. (Helwan), 13h. (Rio Tinto and La Paz), 20h. and 22h. (Taihoku).

Dec. 10d. Readings at 1h. (Manila), 2h. (Helwan), 4h. (La Paz and Taihoku), 6h. (Taihoku), 11h. (La Paz), 12h. (Helwan), 17h. (near Simla).

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Dec. 11d. Readings at 0h. (Batavia), 3h. (La Paz and near Tokyo), 8h. (Vera Cruz and Oaxaca), 9h. (near Mizusawa and Sapporo), 17h. (Taihoku), 23h. (Taihoku and near Mizusawa and Tokyo).

Dec. 12d. 11h. 2m. 10s. Epicentre 40°·3N. 139°·5E. (as on 1921 Oct. 5d.).

$$A = -.580, B = +.495, C = +.647.$$

	Δ °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Mizusawa	1·7	0 25	- 1	0 49	+ 1	—	—
Hakodate	1·7	e 0 29	+ 3	—	—	0·5	1·0
Sapporo	3·1	0 26	-23	0 37	-49	1·0	—
Mito	4·0	1 2	0	—	—	2·0	2·4
Tyosi	4·7	e 1 10	- 3	—	—	2·4	2·9

Mizusawa gives also SN = +0m.47s.

Dec. 12d. Readings also at 0h. (near Mizusawa (2)), 2h. (De Bilt, Helwan, and Kodaikanal), 6h. (La Paz), 9h. (Colombo), 10h. (Tokyo), 16h. (Mizusawa), 17h. (Tiflis), 19h. (La Paz).

Dec. 13d. 6h. 28m. 42s. Epicentre 43°·9N. 9°·5E. (as on 1921 Nov. 29d.).

$$A = +.711, B = +.119, C = +.693.$$

	Δ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	M. m.
Chur	2·9	0	e 0 48	+ 3	i 1 16	- 4	—
Zurich	E. 3·6	350	e 0 58	+ 2	i 1 34	- 5	1·6
	N. 3·6	350	e 0 55	- 1	i 1 34	- 5	1·7
Vienna	Z. 6·5	45	i 1 45	+ 6	—	—	—

No additional readings.

Dec. 13d. Readings also at 2h. (Batavia and La Paz), 3h. (Colombo, Helwan, and Riverview), 9h. and 12h. (La Paz), 19h. (Taihoku).

Dec. 14d. Readings at 7h. and 9h. (Colombo), 13h. (near Tokyo), 14h. (Batavia), 19h. (Taihoku).

Dec. 15d. Readings at 6h. (Batavia), 7h. (Manila and Riverview), 8h. (Riverview and La Paz), 11h. (Manila), 17h. (near Tokyo), 19h. (near Cape Town), 20h. (Manila).

Dec. 16d. 2h. 37m. 15s. Epicentre 14°·5N. 145°·5E. (as on 1919 Jan. 11d.).

$$A = -.798, B = +.548, C = +.250; \quad D = +.566, E = +.824; \\ G = -.206, H = +.142, K = -.968.$$

	Δ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Tokyo	21·8	347	4 50	-13	(e 8 31)	-30	e 8·5	8·8
Osaka	22·1	338	5 23	+17	—	—	—	10·4
Kobe	22·3	337	e 4 45	-24	—	—	6·5	—
Manila	23·8	274	e 5 25	- 1	9 41	+ 1	9·7	10·8
Batavia	43·6	244	8 24	+ 1	—	—	—	—
De Bilt	105·1	336	—	—	—	—	e 53·8	—
Uccle	106·4	336	—	—	—	—	e 50·8	—
La Paz	147·5	98	19 30	[-22]	24 24	?PR ₁	—	—

Additional readings : Osaka gives also MN = +12·6m. Manila MN = +9·8m.
Batavia iE = +10m.10s., i = +13m.49s.

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Dec. 16d. Readings also at 1h. (Zi-ka-wei and near Mizusawa), 4h. (Zi-ka-wei and Taihoku), 11h. (Apia and Taihoku), 13h. Ootomari), 14h. (Barcelona), 16h. (Barcelona and near Lick), 18h. (Rocca di Papa), 22h. (Zi-ka-wei).

Dec. 17d. Readings at 1h. (near Colima), 9h. (Belgrade), 12h. (Apia), 17h. (Taihoku), 18h. (near Lick), 23h. (Helwan, Rocca di Papa, and Vera Cruz).

Dec. 18d. 10h. 16m. 24s. Epicentre 2°0S. 14°0W. (as on 1920 July 4d.).

A = +.970, B = -.242, C = -.035 ; D = -.242, E = -.970 ;
G = -.034, H = +.008, K = -.999.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Coimbra		42.5	6	8 56	+41	14 36	- 6	18.6	21.6
Rocca di Papa		50.0	27	e 25 18	?L	—	—	(e 25.3)	26.3
Florence		51.5	24	24 40	?L	—	—	(24.7)	24.8
Helwan	E.	53.7	50	33 36	?L	—	—	(33.6)	—
Uccle		55.1	14	—	—	—	—	—	15.6
La Paz		55.2	252	9 40	0	—	—	27.6	30.6
Toronto		73.9	317	—	—	—	—	41.9	46.0
Ann Arbor	N.	76.5	314	—	—	—	—	73.6	—
Victoria		104.2	320	—	—	—	—	30.3	37.2

Additional readings and notes : Coimbra gives also LN = +20.4m. All readings are increased by 10m. Rocca di Papa ePN = +26m.0s. and iPN = +26m.6s. Florence P = +24m.35s.

1921. Dec. 18d. 15h. 29m. 24s. Epicentre 2°5S. 71°0W.

A = +.325, B = -.945, C = -.044 ; D = -.946, E = -.326 ;
G = -.014, H = +.041, K = -.999.

A focal depth 0.080 is assumed. See note at end.

		Corr. for Focus	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.	m.
La Paz		-2.0	14.3	189	i 2 53	-10	i 4 54	-32	—	—
Balboa Hts.	E.	-2.0	14.3	324	3 22	+19	5 46	+20	7.2	8.3
	N.	-2.0	14.3	324	3 16	+13	5 56	+30	7.5	8.4
Port au Prince		-3.4	21.1	357	e 4 25	+12	6 34	-59	7.1	7.8
Porto Rico		-3.4	21.4	15	4 26	+ 9	8 1	+21	—	8.1
Merida		-4.9	29.7	323	6 51	+75	(11 16)	+77	11.3	11.4
Oaxaca		-5.1	32.1	310	5 33	-25	(10 18)	-23	10.3	11.1
Vera Cruz		-5.2	32.9	315	6 21	+16	(10 49)	- 5	10.8	11.1
Rio de Janeiro		-5.3	33.8	190	i 6 0	-13	10 36	-32	14.0	—
Puebla		-5.3	34.3	312	6 48	+30	(11 38)	+21	11.6	11.9
Tacubaya		-5.4	35.3	310	6 20	- 7	(11 17)	-15	11.3	11.5
Colima		-5.8	38.3	307	6 35	-18	9 39	?PR ₁	12.1	12.3
Cheltenham		-6.2	41.6	358	7 18	+ 1	12 58	- 3	—	13.2
Georgetown	E.	-6.2	41.8	355	e 7 16	- 2	i 12 55	- 9	e 21.6	22.4
Washington		-6.2	41.8	355	7 17	- 1	12 48	-16	—	13.1
Mazatlan		-6.4	43.0	311	(7 45)	+18	7 45	?P	—	11.0
Fordham	E.	-6.4	43.5	358	7 33	+ 2	13 24	- 1	—	—
	N.	-6.4	43.5	358	7 27	- 4	13 18	- 7	18.1	16.4
St. Louis		-6.6	44.8	340	i 7 39	- 1	(i 13 36)	- 5	i 13.6	13.7
Ithaca	E.	-6.6	45.2	356	7 56	+13	13 54	+ 8	—	14.2
Ann Arbor		-6.8	46.3	350	7 48	- 3	13 54	- 5	—	14.0
Northfield		-6.8	46.7	0	7 51	- 3	14 11	+ 6	—	—
Chicago		-6.8	46.8	345	6 44	-71	12 56	-71	—	13.1
Toronto		-6.8	46.8	353	8 24	+29	i 15 6	+59	e 21.1	—
Ottawa		-7.0	48.1	357	8 5	+ 1	14 26	+ 4	e 19.6	—
Tucson	N.	-7.3	51.3	318	8 14	-12	14 59	- 3	—	15.2
Denver		-7.4	52.5	329	7 36	-58	(14 36)	-40	14.6	14.6
Lick	N.	-8.0	61.5	318	7 33	-117	15 12	-111	—	—
	E.	-8.0	61.5	318	7 36	-114	15 22	-101	—	—

Continued on next page.

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	Corr. for Focus	Δ	Az.	P.		O-C.		S.		O-C.		L.	M.
				m.	s.	s.	m. s.	s.	m. s.				
Berkeley	E.	-8.0	62.2	318	e 9	45?	+11	e 17	30?	+19	—	—	
	N.	-8.0	62.2	318	e 9	41?	+7	e 17	29?	+18	—	—	
Victoria		-8.4	68.2	328	8	56	-75	(i 17	47)	-34	e 34.6	35.5	
Coimbra	E.	-8.6	71.2	47	i 10	36	+7	i 19	16	+20	27.6	28.1	
San Fernando		-8.6	71.6	51	i 10	38	+6	i 19	24	+23	—	23.8	
Granada		-8.7	73.8	51	i 10	51	+5	i 19	47	+21	—	—	
Tortosa		-9.0	77.9	48	i 11	11	+1	20	25	+12	32.1	32.9	
Sitka	E.	-9.1	78.6	331	i 11	19	+5	20	23	+3	—	20.6	
	N.	-9.1	78.6	331	i 11	25	+11	—	—	—	—	20.8	
Algiers		-9.1	78.9	52	i 11	16	0	i 20	36	+12	32.6	38.6	
Barcelona		-9.1	79.2	48	i 11	18	0	i 20	38	+11	e 33.0	33.3	
Oxford		-9.2	79.7	37	i 11	23	+3	i 20	36	+4	26.7	—	
Stonyhurst		-9.2	79.7	36	i 11	24	+4	(20	36)	+4	20.6	28.3	
Eskdalemuir		-9.2	79.7	33	i 11	22	+2	i 20	40	+8	31.6	—	
Edinburgh		-9.2	80.0	33	i 11	18	-4	20	49	+13	—	26.7	
Kew		-9.2	80.2	37	i 12	36	+73	—	—	—	—	26.6	
Dyce	E.	-9.2	81.0	30	i 11	30	+2	i 20	51	+3	24.9	26.6	
	N.	-9.2	81.0	30	i 11	30	+2	i 20	50	+2	—	—	
Paris		-9.2	81.2	40	i 11	26	-4	i 20	53	+3	29.6	33.6	
Marseilles		-9.3	81.9	46	i 11	36	+2	21	6	+9	31.1	34.5	
Ucle		-9.3	82.8	39	i 11	35	-4	i 21	10	+2	—	31.1	
Besançon		-9.3	83.1	42	i 11	38	-3	21	6	-6	29.6	—	
De Bilt		-9.3	83.6	38	i 11	45	+1	21	19	+1	30.6	31.3	
Moncalieri		-9.4	83.9	44	i 11	37	-9	21	21	+1	—	26.1	
Strasbourg		-9.4	84.5	41	i 11	43	-7	e 21	27	0	e 34.6	—	
Zurich		-9.4	84.9	43	e 11	45	-7	i 21	23	-9	—	—	
Florence		-9.5	86.2	46	i 11	57	-2	21	38	-7	—	35.8	
Padova		-9.5	86.8	44	i 11	59	-4	—	—	—	—	—	
Hamburg		-9.5	86.8	37	i 11	54	-9	i 21	32	-20	e 30.6	—	
Rocca di Papa		-9.5	87.0	48	i 11	54	-10	—	—	—	e 35.2	—	
Pola		-9.6	88.2	45	i 12	13	+2	i 21	46	-21	e 31.5	32.3	
Honolulu		-9.6	88.2	292	i 12	21	+10	21	55	-12	—	—	
Cape Town		-9.6	88.2	125	i 11	55	-16	21	28	-39	—	26.0	
Pompeii	E.	-9.6	88.3	49	i 12	36	+25	24	6	? BR ₁	(40.1)	59.1	
Vienna		-9.7	90.2	41	i 12	10	-12	21	52	-37	—	—	
Mostar		-9.7	91.0	47	e 12	1	-26	i 21	41	-57	—	40.3	
Sarajevo		-9.7	91.3	46	i 12	20	-8	—	—	—	—	—	
Belgrade		-9.8	92.8	45	i 12	23	-13	i 21	57	-60	e 29.5	39.5	
Apia		-10.0	99.8	258	—	—	—	—	—	—	—	22.6	
Helwan	E.	-10.1	101.9	60	14	18	+52	—	—	—	—	30.6	
Riverview		—	126.1	223	e 16	37	+27	e 28	50	-44	e 51.4	62.1	
Sydney		—	126.1	223	19	51	? PR ₁	—	—	—	40.0	40.7	
Melbourne		—	127.7	217	e 19	48	? PR ₁	—	—	—	55.1?	71.5	
Hakodate		—	131.5	329	e 17	40	[-102]	—	—	—	—	—	
Mizusawa	E.	—	133.2	325	18	19	[-67]	20	55	? PR ₁	—	—	
	N.	—	133.2	325	18	21	[-65]	20	56	? PR ₁	—	—	
Adelaide		—	133.4	215	e 20	36	? PR ₁	e 29	42	? PR ₁	e 40.6	74.6	
Tokyo		—	136.3	323	18	7	[-86]	21	22	? PR ₁	22.9	24.1	
Simla		—	138.6	42	18	30	[-67]	—	—	—	—	62.1	
Osaka		—	139.5	326	18	26	[-72]	—	—	—	—	39.6	
Kobe		—	139.7	326	i 18	9	[-90]	—	—	—	—	21.9	
Bombay		—	141.0	61	18	26	[-75]	—	—	—	—	—	
Hukuoka		—	143.0	330	18	29	[-76]	20	37	? PR ₁	23.4	—	
Kodaikanal		—	147.7	76	18	48	[-64]	—	—	—	32.4	32.9	
Zi-ka-wei		—	149.0	339	e 18	46	[-68]	—	—	—	—	41.2	
Colombo		—	150.6	80	e 19	12	[-45]	25	6	? PR ₁	31.6	39.6	
Taihoku		—	154.4	333	e 19	5	[-56]	—	—	—	—	—	
Hong Kong		—	159.6	346	18	56	[-72]	—	—	—	42.9	43.1	
Manila		—	163.1	317	e 19	1	[-69]	28	31	? PR ₁	43.6	—	
Batavia		—	171.0	166	19	5	[-70]	28	5	? PR ₁	e 35.6	—	

Additional readings and notes : La Paz gives also $i = +5m.9s.$, $T_0 = 15h.29m.49s.$
 Port au Prince $iPE = +4m.29s.$, $iPNW = +4m.31s.$, $MNW = +8.6m.$
 Cheltenham $iSN = +12m.49s.$, $MN = +13.4m.$ Georgetown $iN = +10m.11s.$ and $+11m.54s.$, $iSN = +12m.59s.$ Mainka readings $PE = +7m.11s.$, $iSE = +13m.39s.$ Fordham $PR_1 = +9m.24s.$, $PR_2 = +10m.24s.$
 St. Louis $iS = +10m.42s.?$ (?PR₁). The true S being given as L. Ann Arbor $PE = +7m.42s.$ Toronto $PR_1 = +12m.6s.$, $iSR_1 = +18m.6s.$, $eL = +28.8m.$, $L = +29.5m.$ Ottawa $iNV = +11m.5s.$, $SR_1? = +16m.50s.$, $T_0 = 15h.29m.27s.$ Lick $PR_1NZ = +9m.39s.$ PSEN = $+15m.30s.$
 Berkeley $iSN = +17m.44s.?$, $iSE = +17m.50s.?$ Victoria $S = +11m.53s.$, iS is given as $iL.$ Coimbra $PR_1 = +13m.46s.$, $SR_1 = +23m.12s.$, $i = +23m.21s.$, $LN = +27.5m.$, $MN = +30.8m.$, $T_0 = 15h.29m.21s.$

Notes continued on next page.

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San Fernando MN = +26.6m. Algiers PR₁ = +14m.36s. Barcelona PR₁ = +14m.33s., PR₂ = +16m.17s., SR₁? = +24m.38s. Oxford PR₁ = +14m.42s. Stonyhurst S = +14m.48s. (?PR₁). The true S is given as L. Eskdalemuir PR₁? = +14m.36s., iSR₁?N = +24m.40s. Dyce also gives sets of Milne-Shaw and Milne readings. Paris SR₁ = +24m.57s. Marseilles PR₁ = +14m.48s., SR₁ = +25m.9s., eL = +35.6m. Uccle i = +13m.48s., PR₁ = +14m.50s., iSR₁ = +25m.11s., iSR₂ = +27m.26s. De Bilt e = +21m.10s. and +25m.20s., MN = +30.8m. Moncalieri MN = +26.7m. Strasbourg iPE = +11m.47s., SR₁ = +25m.9s., eL = +30.6m. Zurich iP = +11m.48s., i = +25m.31s. Florence P = +11m.49s. and +11m.51s. Padova PR₁ = +12m.11s., +12m.15s., +16m.34s., and SR₁ = +26m.34s. Hamburg iZ = +15m.13s., iSf = +25m.44s., e = +30m.36s. Rocca di Papa SN = +14m.12s., SE = +14m.30s., eLN = +35.7m. Pola SR₁ = +27m.26s., MN = +31.9m. Honolulu PR₁N = +15m.39s., SR₁N = +30m.56s. Pompeii L given as P of a later shock. Vienna i = +26m.29s. Mostar, Sarajevo, and Belgrade give a great many PR and SR phases. Riverview PS = +30m.2s. and +40m.37s. Melbourne SR₁ = +36m.42s., SR₂ = +40m.48s., L = +47.6m. Adelaide e = +24m.0s., i = +37m.24s. Kobe MN = +23.3m. Zi-ka-wei PMZ₁ = +21m.25s. and PMZ₂ = +22m.44s. Batavia iN = +19m.41s., i = +23m.25s.

The assumption of so exceptional a focal depth as 0.080 requires very full scrutiny. First let us examine T₀, which may be obtained from the S-P residuals independently of the position of the epicentre. There is a curious difference between the values given by the stations near the epicentre, as far as Ann Arbor ($\Delta = 46.^\circ 3$) and those beyond. The method of computing δT_0 has been frequently described. For La Paz the error in S-P is -22s., corresponding to an error of -23s. in P, but the observed error in P is -10s., hence $\delta T_0 = +18s.$ The following dozen stations give consistently positive results :-

	Δ	δT_0 s.		Δ	δT_0 s.		Δ	δT_0 s.
La Paz	14.3	+18	Puebla	34.3	+41	Wash.	41.8	+18
B. Hts.	14.3	+5	Tacub.	35.3	+3	Ford	43.5	+3
Vieques	21.4	+24	Chelt.	41.6	+6	St. Louis	44.8	+4
Rio de J.	33.8	+11	George.	41.8	+7	Ithaca	45.2	+19

Arranging these in order of magnitude, +41, +24, +19, +18, +18, +11, +7, +6, +5, +4, +3, +3, they suggest a correction $\delta T_0 = +10s.$ or thereabouts. But compare those which immediately follow :-

	Δ	δT_0 s.		Δ	δT_0 s.		Δ	δT_0 s.
Ann A.	46.3	0	Coimb.	71.2	-7	Eskd.	79.7	-6
Northf.	46.7	-14	San F.	71.6	-15	Dyce	81.0	-5
Chic.	46.8	(-11)	Gran.	73.8	-13	Paris	81.2	-13
Toront.	46.8	-9	Sitka	76.5	+6	Mars.	81.9	-7
Ottawa	48.1	-3	Tort.	77.9	-13	Uccle	82.8	-12
Tucson	51.3	-23	Alg.	78.9	-15	Bessan.	83.1	+1
Lick	61.5	(-6)	Barc.	79.2	-14	De B.	83.6	+1
Berkeley	62.2	-7	Oxf.	79.7	+2	Strasb.	84.5	-16

(An error of 1 min. has been assumed for Chicago and 2 min. for Lick).

These 24 observatories give consistently negative results: in order they are +6, +2, +1, +1, 0, -3, -5, -6, -6, -7, -7, -7, -9, -11, -12, -13, -13, -13, -14, -14, -15, -15, -16, -23. Median -8s., Mean -8.3s. Their indications are nearly 20 sec. earlier than those of the stations nearer the epicentre. As yet no explanation can be offered of this discrepancy, which can scarcely be accidental. In some other cases of an appreciable difference in T₀, the stations farther from the epicentre have shown a later T₀; and a reasonable inference would be that there was a smaller, earlier shock registered at the nearer stations (but not at the more distant), followed by a stronger shock which the distant stations took to be the only one. But this explanation clearly will not fit the present case. Errors in tables can scarcely be large enough to explain the difference; or abrupt enough, for the change comes sharply at Ann Arbor. Possibly the distance $\Delta = 45^\circ$ is significant. But we must await further light on the matter.

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Coming now to the questions of epicentre and focal depth; suppose first we take the nearer stations by themselves. Let us adopt their own T_0 , viz., 18d. 15h. 29m. 34s., and group them in Azimuth, showing the correction to adopted Δ without any correction for depth of focus. There are two stations only near Azimuth 150° :—

	Δ	Az.	P.	S.	$\Delta(P)$	$\Delta(S)$	$\delta\Delta$
	°	°	m. s.	m. s.	°	°	°
Rio de J.	33.8	130	5 50	10 26	26.2	26.2	-7.6
La Paz	14.3	169	2 43	4 44	10.9	10.6	-3.5

If we take T_0 from the distant stations, i.e., increase all the times by 18s., we get $\delta\Delta = -6.2$ for Rio, -2.6 for La Paz, with naturally some difference between the indications for S and P in each case. To satisfy these two stations, without any allowance for focal depth, we must adopt an epicentre near $6^\circ S$. $66^\circ W$. with their own T_0 : $5^\circ S$. $67^\circ W$. with the earlier T_0 .

The remaining stations are in nearly the opposite azimuth, adopting the later T_0 , appropriate to them :—

	Δ	Az.	$\delta\Delta$		Δ	Az.	$\delta\Delta$
	°	°	°		°	°	°
Collim.	38.3	307	-8.6	St. L.	44.8	340	-7.7
Oax.	32.1	310	-7.4	Georg.	41.8	355	-7.5
Tacub.	35.3	310	-6.9	Wash.	41.8	355	-7.7
Mazat.	43.0	311	-5.4	Chelt.	41.6	356	-7.2
Pueb.	34.3	312	-4.0	Ithaca	45.2	356	-6.4
Merid.	29.7	323	(-4.5)	Port P.	21.1	357	-3.6
Bal. H.	14.3	324	-1.5	Ford.	43.5	353	-7.5
				Vieq.	21.4	15	-3.2

We have here an arc of 70° (from 307° to 375°) including the opposites of both Rio and La Paz, consistently requiring the epicentre to be nearer them. Moreover the demand clearly increases with Δ , as is the characteristic of allowance for focal depth. We cannot satisfy these observations by moving the epicentre; and we can satisfy them by the assumption of deep focus. Moreover the anticeutral stations in India show that [P] arrives very early at the antipodes. Among the anticeutral stations those in Japan have also been included, though, according to the suggestion of Tokyo and to the evidence of L and M at these stations, they belong probably to a separate shock at 15h. 43m. 20s. given below (Marianne Islands ($19^\circ 0' N$. $144^\circ 0' E$)). It will be seen that they fall in with the Indian readings for [P], which will themselves not accord with a Marianne Island shock, and consequently remain as evidence of a deep focus for the above shock, even when the Japanese readings are removed. If we increase T_0 by 10s. as suggested by the stations near the epicentre, we emphasise the early arrival of [P]. Altogether the evidence is strongly and consistently in favour of a very deep focus, and the curious discrepancy in the values of T_0 does not seem to affect the argument. Let us now return to the former shock and enquire whether any other solution or solutions are possible. There are 15 consistent stations in Azimuths 307° to 375° suggesting a considerable displacement of the epicentre. Grouping these in two lots and adding the European stations we have

No. Stns.	Mean Az.	$\delta\Delta$	Sin Az.	Cos Az.
7	314	-5.5 =	-0.72x +	.69y
8	356	-6.4 =	-0.7x +	1.00y

—giving a solution $x = +1.7$ $y = -6.3$: indicating an epicentre at $3^\circ 8' N$. $72^\circ 7' W$. on the supposition of normal focus. From this epicentre $\Delta = 21^\circ$ for La Paz, and 40° for Rio de Janeiro. Moreover there are the European stations to be satisfied as follows :—

	Δ	Az.	$\delta\Delta$		Δ	Az.	$\delta\Delta$
	°	°	°		°	°	°
Dyce	81.0	30	-9.0	Besançon	83.1	42	-9.8
Eskdalemuir	79.7	33	-8.6	Zurich	84.9	43	-10.3
Edinburgh	80.0	33	-9.0	Moncalieri	83.9	44	-10.9
Stonyhurst	79.7	36	-8.7	Pola	88.2	45	-10.2
Hamburg	86.8	37	-11.0	Florence	86.2	46	-9.9
Oxford	79.7	37	-8.8	Marseilles	81.9	46	-8.7
De Bilt	83.6	38	-9.2	Tortosa	77.9	48	-8.4
Uccle	82.8	39	-9.6	Barcelona	79.2	48	-8.6
Paris	81.2	40	-8.4	San Fern.	71.6	51	-7.1
Strasbourg	84.5	41	-9.9	Granada	73.8	51	-7.4
				Algiers	78.9	52	-8.5

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Dividing these into three groups of 7 stations (according to the azimuth) we get

Az.	$\delta \Delta$	Sin Az.	Cos Az.	Calculated.
35	$-9.2 = +.57 x + .82 y$			$+1.0 - 5.2 = -4.2$
42	$-9.9 = +.67 x + .74 y$			$+1.1 - 4.7 = -3.6$
49	$-8.4 = +.75 x + .66 y$			$+1.3 - 4.2 = -2.9$

The separation in azimuth is not sufficient to enable us to calculate x and y separately, but we may first try the values $x = +1.7$ $y = -6.3$ found above, which give the results under the heading "calculated," clearly in complete disagreement with the observed $\delta \Delta$. If next we combine all three equations and take also the mean of the former two, making

$$\begin{aligned} -9.2 &= +.66 x + .74 y \\ \text{and } -6.0 &= -.40 x + .85 y \end{aligned}$$

the solution is $x = -4.0$ $y = -8.9$, indicating an epicentre at $6^{\circ}4N$. $67^{\circ}0W$. This solution, however, though it satisfies the mean of the former two equations (Azimuths 314° and 356°), gives the residuals -2.3 and $+2.2$ for them separately, which are too large to be admissible; and, of course, La Paz, Rio de Janeiro, and other stations would be in complete disagreement.

For several reasons, some of which will appear later, it seemed desirable to investigate thoroughly this case of suggested very deep focus, to see whether any possible alternative would present itself, but the answer seems to be satisfactorily in the negative.

Dec. 18d. 15h. 43m. 20s. Epicentre $19^{\circ}0N$. $144^{\circ}0E$. (as on 1919 Aug. 27d. 5h.).

$$\begin{aligned} A = -.765, B = +.556, C = +.326; \quad D = +.588, E = +.809; \\ G = -.263, H = +.191, K = -.946. \end{aligned}$$

Many of the following readings have been entered also, chiefly as [P], for the preceding shock, as definite separation does not seem easy. See note to the previous shock.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Tokyo	17.1	348	4 11	+ 5	7 26	+ 6	9.0	10.3
Kobe	17.4	336	4 13	+ 3	—	—	—	8.0
Osaka	17.4	336	4 30	+20	—	—	—	5.7
Hukuoka	19.0	323	4 33	+ 4	—	—	—	—
Mizusawa	20.3	354	4 24	-21	7 0	-39	—	—
Taihoku	21.6	290	e 5 9	+ 9	—	—	—	—
Manila	22.5	262	e 5 5	- 5	—	—	—	29.3
Hakodate	22.9	354	e 3 44	?	—	—	—	—
Zi-ka-wei	23.7	305	e 4 50	-35	8 48	-50	—	27.3
Hong Kong	28.0	282	5 0	-68	—	—	29.0	29.2
Batavia	44.4	238	5 9	?	1 14 29	-34	21.7	—
Colombo	63.4	268	11 10	+36	—	—	—	25.7

Additional records: Kobe gives $MN = +9.4m$. Zi-ka-wei $PMZ_1 = +7m.29s$.
Batavia $iN = +5m.45s.$, $SN? = +14m.9s$. Colombo = $+5m.16s$.

Dec. 18d. Readings also at 0h. (Tifis), 3h. (Apia), 8h. (near Tokyo), 9h. (Taihoku), 12h. (Coimbra), 13h. (Berkeley and Apia), 15h. (Riverview, Zi-ka-wei, and Athens), 16h. (Tortosa, Strasbourg, Besançon, Algiers, Rocca di Papa (3), and Paris; these may be late phases of the 15h. earthquake), 17h. (Kodaikanal), 22h. (near Tokyo), 23h. (Zi-ka-wei, Kodaikanal, Eskdalemuir, Colombo, Hamburg, Uccle, De Bilt, and Helwan).

Dec. 19d. Readings at 0h. (Paris, Oxford, and Kew), 7h. (Manila), 11h. (near Mizusawa), 14h. (near Algiers), 18h. (Manila and Rio Tinto), 19h. (Tifis and near Tokyo), 20h. (near Mostar), 23h. (Taihoku (2) and Zi-ka-wei).

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Dec. 20d. 8h. 4m. 20s. Epicentre 37°·2N. 139°·0E. (as on 1919 April 15d.).

A = -·601, B = +·522, C = +·605.

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Tukubasan	1·3	0 15	- 5	—	—	0·3	0·4
Mito	1·5	0 16	- 7	—	—	0·4	0·5
Tokyo	1·7	e 0 28	+ 2	(0 49)	+ 1	0·8	—
Mizusawa	2·5	0 31	- 8	0 55	-14	—	—
Kyoto	3·4	e 2 16	?	—	—	3·4	3·6
Osaka	3·9	—	—	1 26	-21	2·6	2·8
Kobe	4·0	—	—	2 22	+32	3·0	3·1
Nagasaki	8·8	4 3	?S	(4 3)	+ 5	4·8	—
Zi-ka-wei	15·7	e 4 0	+12	e 7 9	+21	—	—

Additional readings : Tokyo gives also MN = +3·6m. Osaka MN = +3·1m.
Kyoto MN = +3·7m. Kobe MN = +3·6m.

Dec. 20d. Readings also at 1h. (Vienna), 2h. (Batavia, Manila, Apia, Granada, Rocca di Papa (2), Riverview), 5h. (Riverview), 14h. (near Apia), 21h. (Tiflis), 22h. (Simla).

Dec. 21d. 10h. 14m. 45s. Epicentre 2°·0N. 20°·5W. (as on 1921 Jan. 23d.).

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Coimbra	39·8	15	—	—	—	—	19·8	—
Algiers	41·0	30	—	—	—	e 12·2	24·2	
Rocca di Papa	49·7	33	i 8 57	- 8	—	e 29·0	—	
La Paz	50·5	246	9 19	+ 9	16 17	- 8	23·2	26·0
Paris	50·8	19	—	—	—	—	e 30·2	—
De Bilt	54·5	20	—	—	—	—	e 26·2	—
Helwan	E. 56·4	55	15 9	?	—	—	—	39·8

Coimbra gives also e = +5m.55s.

Dec. 21d. Records also at 6h. (Apia), 7h. (Riverview and near Manila), 9h. (Apia and near Athens), 12h. (Rocca di Papa).

Dec. 22d. 20h. 42m. 50s. Epicentre 19°·3N. 62°·5W. (as on 1919 Aug. 30d.).

A = +·436, B = -·837, C = +·330 ; D = -·887, E = -·462 ;
G = +·153, H = -·293, K = -·944.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Porto Rico E.	3·0	249	0 53	+ 6	—	—	1·6	1·9
N.	3·0	249	0 42	- 5	—	—	—	2·1
Port au Prince	9·3	267	e 2 30	+10	(4 17)	+ 7	4·3	4·6
La Paz	36·2	189	—	—	e 13 2	-11	19·4	20·4
Victoria	56·5	316	—	—	—	—	29·8	35·2
De Bilt E.	61·2	40	—	—	—	—	e 29·2	30·2
Rocca di Papa	66·4	51	i 10 40	-14	—	—	—	10·9
Helwan E.	83·7	61	49 10	?L	—	—	(49·2)	—

Additional readings : Port au Prince gives also iP = +2m.35s. La Paz P = 20h.40m.59s., T₁ = 20h.20m.18s. De Bilt eLN = +30·2m.

Dec. 22d. Readings also at 0h. and 1h. (Manila), 2h. (Hong Kong and Batavia), 10h. (Wellington), 14h. (La Paz), 15h. (Helwan), 18h. (Riverview, Melbourne, and Wellington), 19h. (Helwan), 21h. (Manila and near Athens), 22h. (Algiers and near Athens).

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- Dec. 23d. Readings at 2h. (near Balboa Heights), 4h. (near Tokyo), 5h. (Taihoku and near Manila), 7h. (Riverview), 14h. (Batavia), 21h. (Taihoku).
- Dec. 24d. Readings at 1h. (near Athens), 10h. (Helwan), 22h. (La Paz).
- Dec. 25d. Readings at 1h. (Helwan), 6h. (Tiflis), 11h. (La Paz), 18h. (Taihoku).
- Dec. 26d. Readings at 2h. and 3h. (near Nagasaki), 7h. (Sydney and Riverview), 11h. (Batavia), 13h. (near Mizusawa and Tokyo), 14h. (La Paz), 15h. (near Mizusawa and Tokyo), 17h. (near Tokyo (2)), 18h. (La Paz), 20h. (Rocca di Papa, Pola, Athens, Belgrade, Sarajevo, and Pompeii), 22h. (Pola, Belgrade, Sarajevo, and Mostar), 23h. (Apia).
- Dec. 27d. Readings at 4h. (Manila and Taihoku), 16h. (Mizusawa), 17h. (near Tokyo and near Athens), 19h. (Manila), 22h. (Batavia and Manila).
- Dec. 28d. Readings at 1h., 3h. (2), and 4h. (La Paz), 6h. (near Belgrade), 8h. (Helwan, Tiflis, and near Athens), 11h. (near La Paz), 12h. (Manila and near Tokyo), 17h. (near Tokyo), 20h. (near Zurich), 22h. (La Paz), 23h. (near Tokyo and Mizusawa).
- Dec. 29d. Readings at 0h. (Batavia), 2h. (La Paz), 3h. and 6h. (Manila), 11h. (Colombo), 14h. (Taihoku), 16h. (Algiers and Colombo), 19h. (Batavia).
- Dec. 30d. Readings at 2h. (Zi-ka-wei), 7h. and 10h. (Manila), 12h. (La Paz), 23h. (Tacubaya).
- Dec. 31d. Readings at 0h. (Victoria and Honolulu), 3h. (Colombo), 4h. (Melbourne), 6h. (Sinj), 10h. (near Tacubaya), 14h. (La Paz).

BELATED READINGS FROM TIFLIS.

Some readings for 1921 and 1922 were received after 1921 Jan.-June had been printed off. In no case are they helpful. The best chance of help in revision is that of June 29d. 11h. 37m. 50s., for which an epicentre is assigned close to Tiflis ($\Delta = 1^{\circ}4'$): but the Tiflis readings are eP = 11h. 36m. 41s., M = 11h. 37m. 9s., i.e. both of them *before* the assigned T_0 , for which the evidence is too strong to allow of modification by more than 1 min. There must be some error in the Tiflis readings, but without knowing its nature we cannot utilise the information. On Feb. 27 again an eP is given at 18h. 7m.; but this cannot refer to the shock at 18h. 23m. 28s., though a series of M's from 18h. 58m. to 19h. 58m. may do so.

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TABLE.

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