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The International Seismological Summary for 1922 April, May, June.

FORMERLY THE BULLETIN OF THE
BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

The present number of the Summary deals with 89 epicentres, 38 of which are new and 51 repetitions from old epicentres. Corresponding figures are, since the beginning of the Summary in its International form:—

	New.				Old.			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
1918	36	44	43	35	44	38	67	53
1919	20	27	31	22	34	41	91	33
1920	24	27	31	27	47	48	49	42
1921	31	29	26	18	30	36	36	47
1922	32	38			36	51		

These figures are, of course, affected by several causes of uncertainty, relating more especially to the smaller shocks. Many of these, recorded only at a single observatory, and relegated to the notes, could perhaps be counted: but there must be many others of similar magnitude which do not reach any existing observatory. Again, others are recorded at more than one observatory, but so imperfectly that not even a rough epicentre can be assigned. The standard of inclusion doubtless varies considerably: for instance, even a small earthquake in Europe or Japan, where observatories are numerous, is fairly sure to be included: but a greater shock which occurs in high latitudes, or perhaps in Africa, will often escape.

The approximate steadiness of the figures therefore must be regarded as sensibly dependent on the present distribution of seismological observatories, and liable to be upset (in the direction of increase, of course) if new observatories can be established.

The following earthquakes deserve special mention:—

1922 April 8d. 20h. 42m. 12s.: 72°·0N. 8°·5W.

This earthquake in a high latitude was well observed in Europe, and the smallness of the numerous residuals is worthy

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of attention. There are 41 observatories, which record both P and S with differences O—C as follows :—

	s.	P.	S.
Over	+25	2	6
+25 to +16		2	1
+15 to + 6		3	8
+ 5 to - 4		26	13
- 5 to -14		8	7
-15 to -24		1	4
Under	-24	0	3

The concentration near zero in both P and S is satisfactory. Some of the deviations are due to errors of the tables ; but the observatories are almost all within 50° of the epicentre, so that these errors cannot be fully exhibited. Giving them for what they are worth, we may compare the errors shown by the great Chinese earthquake of 1920 Dec. 16, which was fully discussed in the Summary.

Δ	1922 April 8			1920 Dec. 16		
	δP	δS	No. obs.	δP	δS	No. obs.
$^{\circ}$ $^{\circ}$	s.	s.		s.	s.	
10—20	+2	0	7	+1	+ 4	5
21—30	0	+2	13	-9	-14	5
31—40	-6	-3	7	-7	+ 2	3
41—50	+1	-1	5			

It does not seem easy to trace any close connection between these sets of errors. In particular the large negative corrections to the tables suggested by the 1920 Dec. 16 (China) earthquake for $\Delta=21^{\circ}-30^{\circ}$ are not supported by those of the 1922 earthquake, and must be due to something accidental. Such evidence shows us that we are as yet not in a position to adopt new tables. The corrections required by those adopted are small compared with the errors we are liable to meet with in any particular earthquake, and can only be determined from a considerable mass of good material. Meanwhile the adopted tables are good enough for present purposes.

1922 May 11d. 0h. 44m. 32s. : $48^{\circ}\cdot 8S$. $79^{\circ}\cdot 0W$.

May 21d. 15h. 40m. 40s. : $34^{\circ}\cdot 0S$. $73^{\circ}\cdot 0W$.

There was great difficulty in fixing these epicentres, as no observations from S. American stations were available, with the single exception of La Paz. Just as the number was being sent

to Press, however, the much-desired information from Mendoza, Pilar, Cipolletti, Andalgalá, Chacarita, and La Quiaca arrived, and, at the expense of some little delay, the identifications were much improved.

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.

1922 May 12d. 18h. 39m. 20s.: 22°·0S. 170°·0E.

This earthquake is noteworthy from the number of observations of [P] near the anticentre, which may be grouped as follows:

Δ	Individual Results.					Mean.
	s.	s.	s.	s.	s.	s.
140—146	- 3,	- 6,	- 1,	- 3,	- 9	- 3
146—150	$\left\{ \begin{array}{l} - 1, +1, +18, +4, (-126) \\ + 3, -3, +13, +6, + 1 \end{array} \right\}$					+ 5
150—155	+23,	+7,	+22,	-2,	+ 8	+12
155—165	-27,	-1,	+42,	+6		+ 5

It seems doubtful whether any sensible modification of the adopted formula can be inferred from these figures, and it is probable that the focal depth was nearly normal.

There are in fact no cases of abnormal focal depth in the present number, but the details at present to hand concerning the Japanese earthquake of 1925 May 23 promise an important contribution to the problem of depth of focus. Accordant observations at 9 stations (Hong Kong, Manila, Phu-Lien, Hamburg, Vienna, Zagreb, De Bilt, Uccle, and Strasbourg) assign $T_0=2h.9m.38s.$ Times recorded at over 40 stations within 7° of the epicentre (determined locally by Prof. K. Suda as 35°·66N. 134°·78E.) give a value for the focal depth (assuming a surface velocity of 5·4 km./sec. according to Jeffreys and Wrinch) of between 100 and 150 km., or between ·015 and ·023 radius, less than has been suggested (·040) for the normal earthquake. But at La Paz distant 152° from the Epicentre, [P] was received at $T_0+20m.13s.$, or [+14s.] as compared with the adopted formula: suggesting that the focus is at least 75 km. above the normal. The normal depth may thus be 225 km. = ·034 radius. A better estimate can be made when all the information is to hand.

H. H. TURNER.

University Observatory, Oxford.
1926 Jan. 26.

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1922 APRIL, MAY, & JUNE.

April 1d. Readings at 5h. (Mizusawa, near Tokyo, and near Puebla), 7h. (Batavia and Tortosa), 9h. (near Mizusawa), 14h. (near Belgrade), 15h. (Zagreb), 16h. (Belgrade, Budapest, and Zagreb), 23h. (De Bilt and Bidston).

April 2d. 17h. 0m. 45s. Epicentre 11°·0N. 108°·0W. (as on 1919 Nov. 14d.).

A = -·303, B = -·934, C = +·191; D = -·951, E = +·309;
G = -·059, H = -·182, K = -·982.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tacubaya	E.	11·4	44	3 58	+68	5 37	+33	5·9	6·8
	N.	11·4	44	3 55	+65	5 34	+30	5·9	6·3
Puebla		12·4	48	2 20	-45	—	—	3·0	3·1
Vera Cruz		14·0	53	4 11	+45	—	—	4·8	4·9
Berkeley		29·8	337	i 8 41	+75	—	—	e 20·2	—
Chicago		35·5	28	4 33	?	11 43	-80	19·1	—
Ann Arbor	E.	37·8	31	—	—	11 15	?PR ₁	13·5	—
	N.	37·8	31	—	—	11 9	?PR ₁	14·9	—
Georgetown		39·2	40	e 7 15	-33	—	—	e 16·2	—
Washington		39·2	40	—	—	e 12 33	-81	19·9	—
Victoria		39·5	343	—	—	—	—	e 25·0	27·0
Toronto		40·9	32	—	—	—	—	—	19·5
Ottawa		44·0	33	e 4 51	?	e 14 45	-17	e 18·2	—
Northfield		45·0	37	—	—	—	—	e 29·2	—
La Paz		48·1	125	e 8 55	0	e 15 55	0	23·5	25·9
Eskdalemuir		89·1	33	—	—	—	—	37·2	—
De Bilt	E.	95·0	35	—	—	—	—	e 48·2	—
Uccle		95·0	36	—	—	—	—	e 45·2	—
Strasbourg		97·9	37	—	—	—	—	e 40·2	—

De Bilt gives also eLN = +52·2m. Vera Cruz gives its readings at 11h.

1922. April 2d. 19h. 17m. 42s. Epicentre 53°·3N 164°·5W.

A = -·576, B = -·160, C = +·802; D = -·267, E = +·964;
G = -·773, H = -·214, K = -·598.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		16·9	65	—	—	—	—	3·0	6·4
Victoria		26·1	84	3 53	-116	7 51	?	8·8	13·7
	Z.	26·1	84	4 53	-56	6 13	?P	9·7	12·7
Honolulu		31·8	169	—	—	(i 12 0)	-5	i 12·0	16·1
Lick	N.	33·4	101	e 6 54	-6	e 12 14	-16	15·2	16·7
Otomari		33·8	280	31 28	?	—	—	37·8	—
Tucson	E.	43·3	97	e 8 30	+10	—	—	e 21·5	27·1
	N.	43·3	97	—	—	—	—	e 23·7	24·2
Chicago		50·5	70	9 5	-5	16 18	-7	24·4	30·8
St. Louis	E.	51·2	75	e 9 14	0	e 16 29	-5	25·2	—
Ann Arbor	E.	52·4	67	6 24	-178	14 18	-151	19·6	—
	N.	52·4	67	6 30	-172	14 24	-145	19·7	—
Toronto		53·8	63	13 42	?PR ₁	17 48	+42	i 34·4	36·7
Ottawa	E.	54·6	59	9 16	-21	i 17 12	-4	e 25·3	—
Ithaca		56·2	62	e 9 48	+1	17 36	0	e 27·3	—
Zi-ka-wei		56·3	279	i 9 48	0	e 17 32	-6	e 24·3	28·5
Northfield		57·0	58	—	—	e 17 18	-28	33·3	—
Georgetown		58·3	66	e 9 5	-56	18 24	+21	e 30·0	—
Washington		58·3	66	—	—	e 17 36	-27	31·0	—

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.
Cheltenham	E.	58.6	66	—	—	—	e 29.2	33.6	
	N.	58.6	66	—	—	(e 18 21)	+15 e 18.4	36.7	
Tacubaya	E.	59.8	99	10 22	+11	18 29	+ 8	29.9	
Upsala	E.	66.9	0	—	—	—	e 29.9	48.3	
	N.	66.9	0	e 11 0	+ 3	e 19 47	- 2	e 34.1	37.2
Hong Kong		67.2	277	10 58	- 1	19 51	- 1	—	42.6
Dyce	N.	68.6	10	11 6	- 2	20 6	- 3	35.0	43.9
Manila		69.2	269	e 11 18	+ 6	19 48	-28	31.6	—
Edinburgh		69.8	11	e 11 27	+11	20 22	- 2	29.3	41.8
Eskdalemuir	E.	70.3	11	—	—	—	—	30.8	56.3
	N.	70.3	11	11 21	+ 2	20 33	+ 3	34.3	43.3
Konigsberg		71.8	357	i 11 28	0	20 45	- 3	e 29.6	44.2
		71.8	357	11 29	+ 1	21 10	+22	e 32.2	34.7
Stonyhurst		71.8	11	e 11 36	+ 8	20 48	0	—	46.8
Bidston		72.2	11	12 31	+60	21 52	+60	—	45.0
Hamburg		73.0	4	e 11 43	+ 7	i 21 1	- 1	e 34.3	49.4
Oxford		74.1	11	—	—	i 21 16	+ 1	32.1	47.7
De Bilt	E.	74.3	7	—	—	—	—	e 32.3	50.6
	N.	74.3	7	11 46	+ 2	21 18	0	e 34.3	51.1
Kew		74.5	11	18 18	?PR ₁	—	—	—	62.3
Uccle		75.5	8	e 11 52	0	21 29	- 3	e 36.3	38.3
Paris		77.3	9	e 11 18	-45	e 20 53	-59	35.3	47.3
Strasbourg		78.0	6	e 12 4	- 3	22 10	+10	e 47.3	54.4
Vienna		78.5	0	i 12 7	- 3	22 20	+14	e 35.3	40.4
Besançon		79.2	7	—	—	—	—	46.3	—
Innsbruck		79.3	3	i 11 44	-31	22 30	+15	e 39.5	—
Simla		80.1	311	—	—	—	—	e 44.2	—
Porto Rico	E.	80.7	71	—	—	—	—	e 45.9	49.4
Zagreb		80.9	0	e 12 22	- 2	e 22 28	- 6	e 36.3	50.7
Padova		81.3	2	12 46	+19	22 59	+21	—	—
Moncalieri		81.5	6	12 9	-19	22 23	-18	31.8	56.2
Belgrade		81.8	356	e 12 26	- 3	e 22 39	- 5	30.8	—
Florence		82.9	3	—	—	22 48	- 8	—	50.3
Coimbra	E.	84.3	19	e 12 38	- 6	1 23 5	- 6	e 37.8	51.9
	N.	84.3	19	—	—	—	—	41.8	49.8
Barcelona		84.5	9	e 12 30	-15	e 23 4	-10	e 43.6	50.2
Rocca di Papa	E.	85.0	1	e 12 43	- 5	e 23 3	-16	e 51.7	—
	N.	85.0	1	e 12 45	- 3	—	—	e 57.0	62.3
Tortosa	N.	85.0	11	e 11 18	-90	—	—	e 37.3	63.6
Rio Tinto		87.0	17	47 18	?L	—	—	(47.3)	58.3
Granada		87.2	15	12 16	-44	1 22 44	-59	39.0	49.2
San Fernando	E.	88.2	17	—	—	—	—	—	56.0
Algiers		89.3	9	e 13 0	-12	23 43	-23	e 42.7	59.3
Batavia		94.2	267	e 16 18	?	e 24 47	-11	—	—
Riverview		95.3	217	e 13 30	-15	e 24 9	-60	e 44.6	50.7
Kodaikanal		97.7	300	50 36	?L	—	—	67.1	69.5
Colombo		99.3	295	16 18	?	25 54	+ 5	63.8	65.8
La Paz		106.9	95	e 16 48	?	e 29 48	?	47.6	48.4
Mendoza		119.3	107	26 48	?S	(26 48)	-116	(56.8)	67.5
Cipolletti		123.7	111	73 6	?L	—	—	74.6	78.2

Additional readings and notes: Sitka gives also eN = +1m.57s., eE = -17s., MN = +2.3m. Honolulu PN = 18h.52m.38s., MN = +18.0m. Toronto e = +28m.18s., iL = +32.9m., eL = +58.5m. Ottawa SR₁E = +21m.6s., LE = +32.3m., T₀ = 19h.17m.6s. Ithaca L = +32.3m. Zi-ka-wei PR₁Z = +11m.58s., PR₂Z = +15m.1s. Georgetown ePE? = +8m.22s., LE = +34.3m. Washington L = +37.3m. Hamburg MN = +52.3m. De Bilt eSR₁ = +26m.48s. Uccle SR₁ = +27m.14s., MN = +49.0m. Paris MN = +49.3m. Vienna iE = +13m.48s. Besançon reading has been increased by 1h. Porto Rico eLN = +48.4m. Zagreb MNW = +52.4m. Padova PR₁ = +13m.48s. and +15m.8s., SR₁ = +23m.18s. Moncalieri i = +12m.23s., MN = +55.0m. Barcelona ? = +27m.49s., MN = +53.9m. Rocca di Papa ePN = +12m.18s., iP = +12m.41s. Granada MN = +53.9m. Riverview PS = +24m.44s., MN = +50.4m., T₀ = 20h.18m.18s., all readings being given as for 20h.

April 2d. Readings also at 1h. (Tucson, Taihoku, Vera Cruz, Tacubaya, and Berkeley), 2h. (Victoria), 3h. (Manila), 4h. (De Bilt), 7h. (Barcelona), 8h. and 10h. (La Paz), 16h. (near Mizusawa), 20h. (Budapest), 21h. (Uccle and Moncalieri), 23h. (near Tokyo),

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April 3d. 19h. 23m. 40s. Epicentre 20°-0N. 94°-0W.

A = -066, B = -937, C = +342; D = -998, E = +070;
G = -024, H = -341, K = -940.

Very rough.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
La Paz	44.5	143	8 30	0	i 15 10	+ 1	21.6	27.4
La Quiaca	E. 50.4	147	13 8	?PR ₁	—	—	20.8	23.3
	N. 50.4	147	12 56	?PR ₁	—	—	20.8	25.9
Andalgala	N. 54.6	150	10 44	+67	19 56	+100	19.9	23.8
Mendoza	58.3	156	17 14	?S	(17 14)	-49	26.8	29.4
Pilar	59.2	150	10 26	+20	(17 32)	-41	17.5	20.0
Cipolletti	63.8	160	21 50	?SR ₁	—	—	25.3	26.2
Chacarita	64.2	148	(10 32)	- 7	—	—	10.5	10.7
Stonyhurst	74.9	38	e 48 50	?L	—	—	e 48.8	75.8
De Bilt	79.8	38	e 12 20	+ 2	—	—	e 12.3	—
Vienna	87.9	38	—	—	e 23 39	-12	—	—
Zagreb	88.8	40	e 20 59	?L	22 40	-81	—	23.0
Melbourne	126.3	237	—	—	—	—	38.8	49.6
Manila	131.2	313	21 20	?PR ₁	—	—	—	—
Colombo	152.4	13	53 20	?L	—	—	(53.3)	71.3

Andalgala and Mendoza readings increased by 10 min.

April 3d. Readings also at 0h. (Zi-ka-wei), 2h. (near Taihoku), 4h. and 6h. (La Paz), 7h. (Taihoku and Berkeley), 9h. (Batavia), 14h. (Belgrade and La Paz), 19h. (Colombo), 20h. (De Bilt and Riverview), 21h. (De Bilt and La Paz).

April 4d. Readings at 2h. (Colombo), 10h. (Apia), 12h. (near Tokyo), 15h. (Riverview).

1922. April 5d. 9h. 59m. 15s. Epicentre 2°-0S. 137°-0E.

(as on 1919 July 7d.).

A = -731, B = +682, C = -035; D = +682, E = +731;
G = +026, H = -024, K = -999.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Manila	23.0	317	e 5 22	+ 5	e 10 10	+45	i 12.6	14.4
Batavia	30.4	261	i 6 32	0	—	—	e 18.8	—
Taihoku	30.9	333	6 34	- 3	(11 33)	-17	11.6	—
Hong Kong	33.0	320	6 52	- 4	(11 56)	-28	11.6	17.2
Adelaide	33.0	176	—	—	i 12 15	- 9	e 17.4	22.0
Riverview	34.5	159	i 7 7	- 2	e 12 21	-27	e 15.0	21.6
Sydney	34.5	159	6 57	-12	12 33	-15	19.0	21.0
Nagasaki	35.4	351	e 6 24	-53	e 11 55	-66	e 15.2	—
Perth	36.0	212	—	—	13 18	+ 8	26.3	—
Zi-ka-wei	36.4	337	e 7 15	-10	e 12 48	-28	e 15.7	19.0
Melbourne	36.5	169	e 7 9	-17	i 13 9	- 8	18.8	21.8
Osaka	36.7	358	7 33	+ 5	12 43	-37	17.7	22.5
Kobe	36.7	359	e 7 39	+11	i 12 41	-39	16.3	21.0
Wellington	52.0	144	e 9 15	- 5	e 16 51	+ 7	e 30.0	—
Christchurch	52.2	148	9 27	+ 6	14 45	-121	21.8	43.4
Calcutta	53.4	300	9 31	+ 2	17 5	+ 4	24.6	—
Colombo	57.8	279	10 3	+ 5	15 27	-149	18.0	19.8
Kodalkanal	60.5	283	25 21	?L	—	—	47.2	49.2
Simla	65.7	306	19 57	?S	(19 57)	+24	31.8	—
Honolulu	67.7	64	—	—	(20 1)	+ 3	20.0	36.9
Victoria	98.0	42	23 19	?S	31 41	?SR ₁	43.5	49.9
	Z. 98.0	42	—	—	31 55	?SR ₁	45.1	51.6
Berkeley	E. 99.7	52	e 22 58	?L	e 26 35	+42	e 45.4	—
Konigsberg	E. 106.6	328	25 16	?S	(25 16)	-101	e 50.8	70.8
	N. 106.6	328	25 2	?S	(25 2)	-115	e 49.8	70.8
Belgrade	109.9	318	e 19 10	?PR ₁	—	—	70.0	—
Vienna	111.4	321	e 19 5	?PR ₁	28 58	+78	e 51.8	71.8

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Zagreb	112.5	319	—	—	—	—	42.8	71.8
Hamburg	112.6	329	e 19 45	?PR ₁	e 29 6	+75	e 52.8	67.8
Innsbruck	114.8	323	—	—	—	—	e 59.0	—
Strasbourg	116.4	324	e 27 15	?S	(e 27 15)	-66	e 60.5	72.4
De Bilt	E. 116.0	330	—	—	e 29 39	+81	e 56.8	68.4
	N. 116.0	330	—	—	—	—	e 54.8	66.9
Dyce	N. 116.0	337	—	—	e 24 52	?	58.5	—
Rocca di Papa	116.3	317	e 24 51	?	31 9	?	e 55.2	76.4
Uccle	117.0	329	e 20 21	?PR ₁	e 29 50	+84	e 51.8	71.4
Edinburgh	117.4	336	—	—	29 58	+89	—	69.0
Besançon	118.1	323	—	—	—	—	72.8	—
Moncalieri	118.3	322	—	—	36 45	?SR ₁	60.6	74.6
Stonyhurst	118.4	333	e 20 45	?PR ₁	—	—	—	73.8
Kew	119.0	332	—	—	—	—	—	76.8
Bidston	118.7	334	22 30	?PR ₁	31 15	?	—	70.8
Oxford	119.2	332	20 37	?PR ₁	30 21	+100	50.1	61.6
Paris	119.2	327	—	—	e 27 45	-58	56.8	77.8
Marseilles	120.5	320	—	—	—	—	63.8	—
Barcelona	123.5	320	e 20 38	?PR ₁	36 38	?SR ₁	62.8	69.5
Chicago	123.6	39	20 40	?PR ₁	32 5	?	54.8	—
Tortosa	N. 124.8	320	28 45	?S	e 39 45	?SR ₁	e 57.8	82.1
Algiers	125.2	315	e 20 4	?PR ₁	—	—	e 42.8	79.8
Ann Arbor	E. 125.7	35	—	—	49 21	—	63.6	68.3
	N. 125.7	35	19 39	[+31]	29 57	+25	63.8	68.2
Toronto	127.3	33	28 27	?S	(28 27)	-75	e 68.2	82.8
Ottawa	128.0	29	20 57	?PR ₁	33 43	?	59.8	—
Ithaca	129.7	30	—	—	—	—	65.8	—
Northfield	E. 130.3	26	—	—	e 35 45	?	—	—
Coimbra	N. 130.6	326	e 22 58	?PR ₁	e 39 15	?	59.2	70.9
	N. 130.6	326	e 22 34	?PR ₁	—	—	61.8	75.4
Rio Tinto	131.1	321	29 45	?	—	—	—	94.8
San Fernando	E. 131.6	320	—	—	—	—	—	25.2
Georgetown	E. 131.8	35	e 22 55	?PR ₁	—	—	65.8	—
	N. 131.8	35	e 22 57	?PR ₁	—	—	65.1	—
Washington	131.8	35	e 22 35	?PR ₁	—	—	65.8	—
Cheltenham	E. 132.0	34	—	—	—	—	e 61.1	67.6
	N. 132.0	34	—	—	—	—	e 64.4	71.3
Cipolletti	133.0	153	71 33	?L	—	—	(71.6)	90.8
Mendoza	137.7	148	71 15	?L	—	—	76.2	96.6
Pilar	E. 140.9	151	—	—	—	—	77.0	85.8
	N. 140.9	151	—	—	—	—	77.2	86.8
La Paz	149.0	127	20 8	[+14]	33 32	?	72.0	93.0

Additional readings and notes: Manila gives also MN = +12.8m. Batavia
 iN = +6m.56s., iE = +17m.42s., i = +12m.57s., and +14m.17s. Hong
 Kong S = +8m.11s. (?PR₁). Adelaide SR₁ = +13m.39s. Riverview
 ePR₁ = +8m.32s., +8m.47s., PS = +12m.44s., SR₁ = +14m.3s., MN =
 +22.0m., MZ = +22.1m., T₀ = 9h.59m.43s. Perth PR₁ = +7m.19s.,
 SR₁ = +18m.40s., SR₂ = +21m.21s. Zi-ka-wei PR₂Z = +8m.57s., MZ =
 +18.6m., MN = +18.9m. Osaka MN = +22.0m. Kobe MN = +20.2m.
 Christchurch SR₁ = +19m.33s. Simla SN = +27m.39s., eLE = +22.4m.
 Honolulu MN = +28.2m. Berkeley iE = +24m.34s., eE = +32m.4s.
 Konigsberg eZ = +43m.52s. Belgrade e = +20m.27s., +21m.21s., and
 +33m.2s. Vienna iZ = +19m.42s. Zagreb MNW = +61.8m. Ham-
 burg eSR₁ = +35m.33s., MZ = +67.2m., MN = +73.0m. Strasbourg S =
 +36m.45s., L = +60.8m., MN = +73.8m. De Bilt ePR₁ = +20m.9s.,
 eSR₁ = +36m.15s. Dyce eN = +25m.42s. and +26m.57s. Rocca di
 Papa eL = +63.2m. Uccle e = +27m.11s., SR₁ = +36m.45s., eL =
 +120.8m. Moncalieri MN = +77.4m. All these readings increased by
 one hour. Bidston P = +28m.15s. Paris e = +29m.45s. Barcelona
 MN = +84.2m. Chicago L = +60.8m. and +75.8m. Toronto S =
 +38m.21s., e = +55m.33s., eL = +71.4m. Ottawa PR₁V = +25m.21s.,
 PR₂ = +28m.17s., SR₁N = +41m.15s., SR₂V = +46m.1s., T₀ = 10h.5m.5s.
 San Fernando MN = +24.0m. Washington L = +71.8m.

April 5d. Readings also at 0h. (Taihoku and La Paz), 1h. (Tiflis), 2h. (La Paz),
 3h. (Pilar, Cipolletti, and Mendoza), 4h. (near Algiers), 6h. (La Paz),
 9h. (Tokyo), 10h. (Pilar, Cipolletti, and Mendoza), 12h. (La Paz), 13h.
 (near Manila), 16h. (Marseilles), 19h. (Tiflis), 21h. (La Paz).

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April 6d. 3h. 13m. 0s. (I) } Epicentre 14°-0S. 77°-0W.
 8h. 0m. 45s. (II) }

A = +.218, B = -.945, C = -.242; D = -.974, E = -.225;
 G = -.054, H = +.236, K = -.970.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	La Paz	8.9	107	2 14	- 1	4 2	+ 1	4.5	5.4
II		8.9	107	2 13	- 2	4 2	+ 1	4.6	5.0
I	La Quiaca	13.5	129	—	—	—	—	8.2	9.5
II		13.5	129	—	—	—	—	19.0	20.2
I	Mendoza	20.5	159	3 54	-53	—	—	10.1	11.1
II		20.5	159	5 33	+46	—	—	12.2	13.4
I	Pilar	20.9	148	4 48	- 4	—	—	10.3	13.8
II		20.9	148	4 45	- 7	—	—	10.8	14.0
I	Cipolletti	20.9	148	5 3	+11	—	—	11.0	14.2
II		26.2	164	11 42	?S	(11 42)	+76	17.0	19.1
I	Chacarita	26.2	164	13 3	?L	—	—	18.8	21.4
II		26.5	144	4 12	-101	—	—	12.2	14.9
I		26.5	144	5 42	-11	(10 0)	-32	10.0	10.6
II		26.5	144	—	—	—	—	8.8	18.4
I	Rio de Janeiro	33.2	110	—	—	—	—	e 17.5	—
II		33.2	110	—	—	—	—	e 16.8	—
I	Georgetown	53.0	0	—	—	e 16 52	- 4	—	—
II	Washington	53.0	0	—	—	e 17 50	+54	—	—
I	Ann Arbor	53.0	0	—	—	e 17 50	+54	—	—
II		56.6	355	—	—	—	—	28.9	—
I	Chicago	56.6	351	1 17 40	?S	(1 17 40)	+ 2	32.0	—
II		56.6	351	1 17 43	?S	(1 17 43)	- 1	32.8	—
I	Toronto	57.7	358	—	—	—	—	50.6	—
II	Ottawa	59.4	2	—	—	e 18 19	+ 3	28.0	—
I	Victoria	59.4	2	—	—	e 17 51	-25	27.2	—
II		74.7	330	39 53	?L	—	—	(39.9)	43.5
I	Coimbra	74.7	330	—	—	—	—	—	43.7
II		83.4	46	12 29	- 9	22 30	-31	40.5	45.6
I	Granada	83.4	46	12 42	+ 4	22 44	-17	e 40.8	—
II	Barcelona	85.7	50	1 12 53	+ 1	1 24 48	+81	—	—
I	Bidston	91.3	48	—	—	—	—	e 47.1	48.7
II		91.3	48	—	—	—	—	e 47.4	—
I	Oxford	92.0	36	—	—	—	—	—	52.2
II	Eskdalemuir	92.0	36	—	—	—	—	—	52.8
I	Edinburgh	92.4	38	—	—	—	—	—	49.7
II		92.5	33	—	—	24 0	-40	44.0	51.0
I	Kew	92.5	33	—	—	e 24 2	-38	45.2	—
II		92.8	33	46 0	?L	—	—	(46.0)	—
I	Paris	92.8	33	46 15	?L	—	—	(46.2)	—
II		92.9	38	—	—	—	—	—	56.0
I	Marseilles	92.9	38	—	—	—	—	—	66.2
II		93.8	40	—	—	—	—	e 54.0	55.0
I	Uccle	93.8	40	—	—	—	—	e 54.2	55.2
II		94.1	47	—	—	—	—	49.0	—
I	Moncalieri	95.4	39	—	—	e 24 21	-49	e 40.0	—
II		95.4	39	—	—	—	—	—	47.2
I	De Bilt	96.2	45	—	—	—	—	36.6	—
II		96.2	45	—	—	e 26 17	+59	50.5	—
I	Hamburg	96.3	38	—	—	—	—	e 45.0	50.8
II		96.3	38	—	—	e 24 48	-31	e 41.0	51.8
I	Strasbourg	96.3	38	—	—	—	—	e 45.2	50.8
II		96.3	38	—	—	e 24 57	-22	e 41.2	51.9
I	Rocca di Papa	97.0	41	—	—	—	—	52.5	—
II		97.0	41	—	—	—	—	e 59.2	—
I	Hamburg	99.1	49	—	—	—	—	e 52.4	60.0
II		99.5	37	—	—	—	—	e 50.0	54.0
I	Zagreb	99.5	37	—	—	—	—	e 51.2	55.2
II		102.1	45	—	—	—	—	48.0	56.0
I	Vjenna	102.1	45	—	—	—	—	47.2	57.2
II		102.7	42	—	—	—	—	e 54.2	57.6
I	Zi-ka-wei	155.9	318	20 6	[+ 3]	—	—	—	—
II		155.9	318	e 20 8	[+ 5]	—	—	—	—

Additional readings: Rio Janeiro gives also I eN = +17m.0s., II e = +17m.51s.
 Georgetown I eN = +17m.0s. Chicago I PR₁ = +19m.38s., S? = +23m.30s.
 II PR₁ = +19m.42s., S? = +23m.45s. Toronto I L = +58.5m. Ottawa
 I eLE = +25.0m., L = +37.5m., II L = +37.2m. Moncalieri I e =
 3h.12m.33s., II S? = +38m.45s. Zagreb I MNW = +55.0m., II MNW =
 +55.2m.

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April 6d. Readings also at 3h. (La Paz and near Granada), 4h. (Colombo), 6h. and 8h. (La Paz), 9h. (Colombo), 11h. (Marseilles), 16h. (Strasbourg), 22h. (Batavia).

April 7d. 6h. 38m. 0s. Epicentre 43°·8N. 11°·2E. (Florence) (as on 1921 May 20d.).

A = +·708, B = +·140, C = +·692.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	0·0	—	0 2	+ 2	—	—	—	0·5
Padova	1·7	17	0 33	+ 7	0 59	+11	—	1·3
Zurich	4·0	332	e 0 50	-12	e 1 33	-17	—	—
Zagreb	4·0	58	—	—	—	—	e 1·8	2·8
Strasbourg	5·3	334	e 2 18	?S	(e 2 18)	- 7	2·7	—

Additional readings: Zurich gives also iS = +1m.26s. Zagreb MNW = +2·6m.

April 7d. 15h. 58m. 18s. Epicentre 23°·5N. 119°·0E.

A = -·445, B = +·802, C = +·399; D = +·875, E = +·485;

G = -·193, H = +·349, K = -·917.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hokoto	0·5	86	-0 18	-26	—	—	0·1	—
Taihoku	2·8	56	e 0 42	- 2	—	—	—	—
Hong Kong	4·6	256	1 33	+22	—	—	—	4·2
Zi-ka-wei	8·0	15	e 2 3	+ 2	e 3 35	- 2	—	4·7
Manila	9·1	168	e 2 24	+ 6	(4 7)	+ 1	4·1	4·9
Nagasaki	13·3	44	e 3 25	+ 8	—	—	e 7·1	—
Batavia	32·0	202	6 28	-19	—	—	—	—
Colombo	41·1	251	16 12	+488	22 42	+500	26·5	30·7
Vienna	80·5	320	e 12 21	- 1	—	—	e 45·7	54·2
Hamburg	81·8	325	—	—	—	—	e 43·7	51·7
Zagreb	81·8	317	e 12 24	- 5	—	—	43·7	54·7
De Bilt	85·1	326	—	—	—	—	e 45·7	48·6
Strasbourg	85·5	322	—	—	—	—	e 47·7	—
Uccle	86·1	324	—	—	—	—	e 45·7	48·7
Edinburgh	86·8	330	—	—	—	—	45·7	56·7
Eskdalemuir	87·2	330	—	—	e 23 42	- 1	41·7	49·6
Moncalieri	87·4	319	e 17 55	?PR ₁	—	—	49·9	—
Kew	88·2	327	—	—	—	—	—	54·7
Bidston	88·3	329	—	—	—	—	—	59·5
Paris	88·3	323	—	—	e 40 46	?	48·7	57·7
Oxford	89·7	327	—	—	—	—	—	58·6
Tortosa	94·1	318	—	—	—	—	e 51·7	54·1

Additional readings and notes: Hong Kong reading is given as on 6d. Zi-ka-wei gives also MN = +4·9m., MZ = +5·5m. Manila MN = +4·5m. Colombo: Are the readings 8 min. in error? Eskdalemuir MN = +57·2m.

April 7d. Readings also at 2h. (near La Paz), 3h. (Zi-ka-wei), 5h. (Tiflis), 8h. (Zi-ka-wei), 12h. (La Paz), 16h. (Taihoku), 18h. and 21h. (near Belgrade).

April 8d. 3h. 32m. 42s. Epicentre 4°·6S. 101°·6E. (as suggested by Batavia).

A = -·200, B = +·976, C = -·080; D = +·980, E = +·201;

G = +·016, H = -·079, K = -·997.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	5·5	107	i 1 24	- 1	i 2 1	-30	—	3·0
Colombo	24·5	298	11 6	?S	(11 6)	+72	15·3	18·8
Manila	27·1	45	e 6 0	+ 1	—	—	e 12·6	—
Kodaikanal	28·2	302	17 54	?L	—	—	(17·9)	—
Hong Kong	29·6	24	7 28	+64	—	—	—	18·8
Taihoku	35·4	31	—	—	—	—	e 18·3	—
Zi-ka-wei	40·5	27	7 54	- 5	—	—	—	25·8
Simla	42·6	329	e 14 42	?S	(e 14 42)	- 1	—	—
Adelaide	45·7	136	—	—	—	—	e 26·9	—

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.
Melbourne	51.6	136	—	—	—	—	e 26.1	37.8
Riverview	54.4	130	—	—	e 17 4	-10	e 24.7	34.3
Vienna	90.2	319	e 13 21	+ 4	—	—	—	—
Zagreb	90.3	316	e 13 24	+ 6	e 24 12	- 5	59.3	—
Rocca di Papa	92.2	311	i 21 26	?	e 30 48	?SR ₁	—	45.3
Strasbourg	96.0	319	—	—	—	—	e 63.3	—
Moncalieri	96.0	315	—	—	e 25 7	- 9	e 58.6	—
De Bilt	E. 97.6	321	—	—	—	—	e 62.3	68.0
	N. 97.6	321	—	—	—	—	e 60.3	68.4
Uccle	98.1	320	—	—	—	—	—	58.3
W. Bromwich	101.9	322	21 36	?PR ₁	25 46	-28	—	31.9
Edinburgh	102.1	325	64 18	?L	—	—	(64.3)	—
Eskdalemuir	102.2	325	—	—	e 26 18	+ 1	52.3	—
Bidston	102.4	322	—	—	—	—	—	76.3
Chicago	141.9	11	—	—	—	—	e 82.3	—
La Paz	156.6	205	e 20 18	[+14]	e 34 9	?	78.1	81.1

Additional readings and notes : Colombo gives also S = +13m.0s. Riverview
 MN = +33.0m. Simla eE = +15m.0s. Moncalieri S? = +38m.33s.
 Chicago L = +85.9m.

1922. April 8d. 20h. 42m. 12s. Epicentre 72°-0N. 8°-5W.

A = +.306, B = -.046, C = +.951 ; D = -.148, E = -.989 ;
 G = +.941, H = -.141, K = -.309.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Dyce	N. 15.0	166	i 3 37	- 2	6 12	-20	7.6	9.2
Upsala	E. 15.9	126	e 3 56	+ 5	i 7 4	+11	e 8.5	9.2
	N. 15.9	126	—	—	—	—	e 9.1	9.3
Edinburgh	16.2	169	3 56	+ 1	7 1	+ 1	—	12.1
Eskdalemuir	16.8	170	i 4 5	+ 3	7 20	+ 7	8.6	9.2
Stonyhurst	18.3	168	4 48	+27	—	- 2	9.3	10.5
Bidston	18.7	170	5 23	+58	8 48	+53	(10.6)	12.8
W. Bromwich	19.6	167	4 38	+ 2	8 13	- 2	10.3	11.8
Hamburg	20.1	147	i 4 47	+ 5	i 8 27	+ 2	e 12.1	15.1
Oxford	20.5	167	i 4 51	+ 4	i 8 38	+ 4	11.2	16.1
Kew	20.8	166	8 48	?S	(8 48)	+ 8	—	12.8
De Bilt	20.8	156	4 53	+ 2	8 44	+ 4	10.3	17.4
Konigsberg	E. 21.1	129	4 59	+ 5	8 44	+ 2	e 10.6	12.1
	N. 21.1	129	4 58	+ 4	8 42	- 4	e 10.6	11.9
Uccle	21.8	158	i 5 4	+ 1	9 9	+ 8	10.8	12.9
Paris	23.7	162	i 5 22	- 3	9 37	- 1	12.1	17.8
Strasbourg	24.6	154	i 5 35	+ 1	10 4	+ 9	e 13.3	19.7
Besançon	25.7	157	e 5 44	- 1	10 10	- 6	e 13.8	—
Zurich	25.9	153	e 5 43	- 4	e 10 24	+ 4	e 16.1	—
Vienna	26.3	141	e 5 50	- 1	10 56	+28	e 14.0	18.2
Innsbruck	26.4	149	i 5 51	- 1	e 10 10	-20	e 15.5	20.0
Lemberg	26.5	129	e 6 0	+ 7	e 10 48	+16	e 14.2	15.1
Budapest	27.6	138	e 6 5	+ 1	e 7 18	?	e 11.8	—
Moncalieri	28.1	155	6 5	- 4	10 51	-10	14.8	17.8
Padova	28.3	149	e 6 23	+12	12 13	+69	15.6	20.3
Zagreb	28.6	143	e 6 12	- 2	11 14	+ 4	e 15.5	18.4
Marseilles	29.5	159	e 6 21	- 2	e 11 22	- 4	14.3	18.8
Florence	29.8	151	5 59	-27	—	—	19.1	19.1
Belgrade	30.4	137	e 6 19	-13	i 11 7	-34	e 15.1	19.0
Barcelona	31.0	165	e 6 16	-22	11 8	-43	e 15.7	17.9
Tortosa	N. 31.5	168	e 6 34	- 9	11 42	-18	14.6	20.6?
Coimbra	E. 31.8	180	e 6 53	+ 8	—	—	16.2	18.2
	N. 31.8	180	6 38	+ 7	i 11 58	- 7	17.0	17.2
Rocca di Papa	32.0	150	i 6 41	- 6	e 11 0	-68	i 20.8	—
Pompeii	33.2	147	6 53	- 5	12 28	+ 1	19.8	24.8
Rio Tinto	34.2	178	15 18	?L	—	—	(15.3)	21.3
Granada	34.9	174	7 1	-11	i 12 53	- 1	i 17.7	21.5
Azores	35.4	203	16 48	?L	—	—	(16.8)	18.8
San Fernando	35.6	178	7 17	- 1	13 18	+14	—	19.8
Algiers	35.7	164	7 9	-10	13 5	- 1	19.8	20.6

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.
Athens	37.8	137	e 7 32	- 4	e 13 19	- 16	21.4	22.4
	37.8	137	i 7 38	+ 2	i 13 29	- 6	—	25.0
Ottawa	40.4	267	7 53	- 5	14 6	- 7	e 18.8	30.3
Northfield	40.6	263	9 36	?PR ₁	—	—	22.8	—
Toronto	43.1	270	12 24	?	18 12	?SR ₁	e 20.6	24.6
Ithaca	43.4	267	e 10 2	+101	14 54	0	19.8	—
Sitka	E. 45.8	323	—	—	—	—	e 20.0	24.9
Georgetown	E. 46.7	265	e 8 48	+ 3	e 15 48	+ 11	e 22.2	—
	N. 46.7	265	e 8 48	+ 3	e 15 52	+15	e 22.0	—
Washington	E. 46.8	265	9 8	+23	16 30	+53	25.0	—
Cheltenham	E. 46.8	264	—	—	15 43	+ 5	25.6	26.7
	N. 46.8	264	8 50	+ 4	15 29	- 9	—	23.8
Helwan	47.2	131	8 52	+ 4	15 50	+ 6	—	32.1
Chicago	47.4	276	8 47	- 3	15 38	- 8	22.6	26.1
St. Louis	51.0	276	i 9 18?	+ 5	13 54	?	20.4	28.1
Victoria	51.3	310	15 38	?	19 35	?SR ₁	23.0	27.9
	Z. 51.3	310	14 48	?	19 18	?SR ₁	26.8	31.6
Denver	54.5	290	—	—	—	—	24.8	26.8
Simla	N. 59.3	83	18 36	?S	(18 36)	+21	35.8	36.9
Berkeley	E. 61.0	306	e 11 6	+47	e 19 6	+30	e 30.3	35.7
	N. 61.0	306	e 10 54	+35	—	—	—	35.7
	Z. 61.0	306	e 10 44	+25	—	—	—	35.5
Lick	N. 61.3	305	—	—	i 23 16	?SR ₁	34.0	38.3
Tucson	N. 63.1	292	—	—	—	—	e 31.9	38.5
Bombay	69.4	92	16 27	?	—	—	—	—
Vera Cruz	71.0	275	—	—	—	—	40.0	—
Zi-ka-wei	71.2	43	11 41	+17	e 21 11	+31	—	46.6
Tacubaya	E. 71.9	277	11 44	+15	21 1	+12	36.0	—
Hong Kong	73.1	53	22 43	?S	(22 43)	+42	—	46.0
Kodaikanal	79.0	91	33 6	?	—	—	49.9	54.0
Colombo	82.9	90	24 48	?S	(24 48)	+112	(36.8)	67.8
Honolulu	E. 84.4	332	—	—	—	—	e 44.6	50.8
	N. 84.4	332	—	—	—	—	e 40.9	49.8
Manila	87.2	49	e 13 26	+26	—	—	42.0	—
La Paz	96.9	236	14 18	+24	e 26 8	+43	49.1	61.7
La Quiaca	E. 101.7	233	56 12	?L	—	—	(56.2)	63.7
Pilar	N. 110.5	228	61 36	?L	—	—	(61.6)	72.1
	E. 110.5	228	61 6	?L	—	—	(61.1)	69.8
Mendoza	112.7	232	60 54	?L	—	—	(60.9)	74.8
Cipolletti	118.4	230	63 54	?L	—	—	(63.9)	78.2
Riverview	140.4	27	e 18 19	?	—	—	e 59.0	77.6

Additional readings : Hamburg gives also MZ = +16.7m., MN = +17.1m.
 De Bilt MN = +14.8m., T₀ = 20h.42m.16s. Konigsberg EN = +5m.34s.,
 MZ = +12.3m. Uccle MN = +13.2m. Paris MN = +13.8m.
 Strasbourg iPN = +5m.36s., PS = +10m.30s., MNZ = +17.4m., T₀ =
 20h.42m.8s. Zurich iP = +5m.45s. Epicentre 71°8N. 8°9W. Vienna
 iPZ = +5m.51s., PR₂ = +6m.52s., i = +7m.32s., SR₁ = +12m.50s., MN =
 +19.2m. Innsbruck MNW = +21.4m. Moncalieri MN = +18.3m.
 Padova PR₁ = +8m.19s. and +12m.8s. Zagreb ePNW = +6m.11s.,
 i = +6m.16s., iNE = +6m.27s., iPR₂ = +7m.19s., MNW = +27.6m. Mar-
 seilles L = +15.8m. Belgrade PR₁ = +6m.57s. Barcelona PR₁ =
 +7m.24s., ? = +10m.44s. and +11m.44s., MN = +22.3m. Rocca di
 Papa eV = +6m.39s., PR₁ = +8m.24s., iLV = +21.8m. Granada MN =
 +21.2m. San Fernando MN = +21.6m. Algiers MN = +23.3m.
 Athens iN = +9m.28s., T₀ = 20h.42m.26s. Ottawa PR₂ = +9m.34s.,
 SR₁E = +16m.38s., T₀ = 20h.42m.14s. Toronto eL = +22.6m. Ithaca
 eL? = +17.8m. Sitka eN = +28m.34s. Georgetown LE = +25.8m.,
 LN = +26.0m. Cheltenham PR₁N = +10m.39s., SR₁ = +18m.58s.,
 eE = +20m.48s., eN = +21m.19s. Washington L = +29.5m. Simla
 SN = +31m.36s. Berkeley iEN = +33m.8s., iE = +33m.29s.

April 8d. Readings also at 0h. (Manila), 1h. (near Mizusawa), 2h. (near Belgrade and near Tacubaya), 3h. (Vera Cruz), 6h. (Zagreb and Vienna), 7h. (near Belgrade (4)), 10h. (Rocca di Papa and Zagreb), 11h. (Eskdalemuir), 12h. (Riverview and Adelaide), 23h. (Eskdalemuir, Strasbourg, and Uccle).

April 9d. Readings at 1h. (Granada), 6h. (Taihoku and Zi-ka-wei), 13h. (Ham-burg, De Bilt, and Eskdalemuir), 14h. (Rocca di Papa), 23h. (Uccle).

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April 10d. 3h. 9m. 36s. Epicentre 24°·0N. 123°·0E. (as on 1922 Jan. 10d.).

A = -·498, B = +·766, C = +·407.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	1·7	308	e 0 26	0	—	—	0·8	0·8
Zi-ka-wei	7·3	349	e 1 51	0	e 3 21	+ 3	—	5·0
Manila	9·6	192	—	—	—	—	e 5·4	—
De Bilt	86·7	327	—	—	—	—	e 49·0	56·3

No additional readings.

April 10d. 3h. 54m. 12s. Epicentre 15°·0S. 155°·0E.

A = -·875, B = +·408, C = -·259 ; D = +·423, E = +·906 ;
G = +·235, H = -·109, K = -·966.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	19·1	190	(e 4 34)	+ 4	e 8 10	+ 6	e 10·3	12·4
Sydney	19·1	190	7 48	?S	(7 48)	-16	10·9	12·7
Melbourne	24·5	200	—	—	11 36	?L	14·5	16·8
Adelaide	24·8	213	—	—	10 0	+ 1	e 14·6	18·2
Perth	39·4	236	—	—	13 55	- 2	23·9	—
Manila	44·8	310	e 9 57	+85	(16 5)	+53	16·1	—
Batavia	48·0	275	e 8 48	- 6	—	—	—	—
Zi-ka-wei	Z. 56·3	326	—	—	e 18 21	+43	—	31·4
Honolulu	E. 58·7	53	—	—	e 18 28	+21	—	—
Victoria	95·8	41	—	—	—	—	39·8	42·8
Chicago	120·3	49	—	—	—	—	e 54·8	—
De Bilt	E. 135·9	332	—	—	—	—	e 57·8	80·6
	N. 135·9	332	—	—	—	—	e 64·8	76·0
Eskdalemuir	136·4	340	—	—	—	—	e 60·8	—
Uccle	137·1	332	—	—	—	—	e 59·8	—
Tortosa	N. 146·0	324	—	—	—	—	e 75·8	90·4

Additional readings: Riverview gives also MN = +13·3m., MZ = +25·0m.
eP is given as ePR₁. Melbourne SR₁ = +13m.0s. Perth PR₁ =
+7m.10s., SR₁ = +17m.18s. Zi-ka-wei S has been increased by 10m.
Honolulu eN = +16m.28s. Chicago L = +65·8m.

April 10d. 13h. 57m. 25s. Epicentre 35°·5N. 141°·0E.

A = -·633, B = +·512, C = +·581.

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	1·1	10 5	-12	10 13	-18	10·3	0·7
Nagoya	3·4	0 47	- 6	(1 31)	- 3	1·5	2·0
Mizusawa	E. 3·6	0 53	- 3	1 54	+15	—	—
	N. 3·6	0 54	- 2	1 52	+13	—	—
Kobe	4·9	1 26	+10	2 7	- 7	2·6	3·7
Osaka	5·3	1 24	+ 2	(2 24)	- 1	2·4	2·8

Additional readings: Kobe gives also MN = +4·3m. Osaka MN = +2·7m.

April 10d. Readings also at 7h. (Kodaikanal and Colombo), 8h. (Zi-ka-wei, Simla, and La Paz), 10h. (near Melbourne and Riverview), 13h. (Colombo), 14h. (near Belgrade), 15h. (Zi-ka-wei and near Mizusawa), 16h. (Taihoku and near Batavia), 17h. (near Mizusawa), 21h. (Cipolletti and Mendoza), 23h. (Colombo).

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April 11d. 0h. 18m. 20s. Epicentre 18°·0S. 167°·0E. (as on 1921 Aug. 15d.).

A = -·927, B = +·214, C = -·309; D = +·225, E = +·974;
G = +·301, H = -·070, K = -·951.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	20·8	82	4 57	+ 6	9 6	+26	11·0	12·8
Sydney	21·3	219	-0 14	?	—	—	10·2	15·0
Melbourne	27·7	220	6 34	+29	11 52	+58	16·3	20·0
Perth	48·0	243	—	—	16 18	+24	29·8	—
Honolulu	E. 52·2	43	—	—	e 16 42	- 4	26·8	28·1
	N. 52·2	43	—	—	—	—	23·6	30·0
Manila	55·9	303	e 9 55	+10	—	—	—	—
Batavia	59·8	273	e 10 22	+11	e 18 8	-13	—	—
Zi-ka-wei	65·8	318	10 33	-17	e 18 51	-44	—	25·4
Berkeley	86·6	48	—	—	—	—	e 39·5	—
Lick	N. 86·9	48	—	—	—	—	i 42·1	—
Victoria	90·7	39	23 47	?S	28 45	?	e 41·2	45·6
Tucson	E. 93·2	56	—	—	—	—	e 44·1	48·5
Cipolletti	103·2	139	59 28	?L	—	—	61·9	66·2
Mendoza	106·6	134	50 4	?L	—	—	62·5	68·1
Pilar	E. 110·4	135	52 10	?L	—	—	62·0	63·5
	N. 110·4	135	57 10	?L	—	—	62·2	63·7
Chicago	113·2	50	28 23	?S	(28 23)	+27	54·7	—
La Paz	115·7	119	e 25 34	?	37 34	?SR ₁	69·0	74·5
Toronto	119·3	49	e 21 40	?PR ₁	e 36 58	?SR ₁	62·4	72·7
Georgetown	121·2	53	—	—	—	—	e 62·1	—
Washington	121·2	53	—	—	—	—	e 62·7	—
Cheltenham	121·3	53	—	—	—	—	e 62·1	63·8
Ithaca	121·4	49	—	—	—	—	61·7	—
Ottawa	E. 121·7	48	—	—	e 37 18	?SR ₁	64·7	—
Tiflis	125·7	309	e 3 58	?	e 11 1	?	19·7	—
Konigsberg	135·2	333	—	?	—	—	e 70·2	83·2
Hamburg	140·2	339	e 21 40	?	—	—	e 62·7	83·7
Edinburgh	141·4	351	78 40	?L	—	—	e (78·7)	—
Vienna	141·5	328	e 19 39	[- 3]	e 22 16	?PR ₁	e 67·7	86·1
Eskdalemuir N.	142·0	351	e 22 24	?PR ₁	e 40 40	?SR ₁	e 67·7	85·7
De Bilt	143·1	342	—	—	e 22 40	?PR ₁	e 66·7	88·7
Stonyhurst	143·2	350	e 22 40	?PR ₁	—	—	61·7	96·7
Zagreb	143·3	326	e 22 40	?PR ₁	—	—	(69·3)	87·7
Bidston	143·7	350	63 20	?L	69 20	?L	e 65·7	83·7
Uccle	144·4	340	—	—	—	—	—	84·7
Oxford	145·0	347	—	—	—	—	—	90·7
Strasbourg	145·1	336	e 19 42	[- 6]	e 22 47	?PR ₁	e 71·7	—
Kew	145·1	346	—	—	—	—	(80·1)	110·7
Florence	147·1	327	80 5	?L	—	—	—	92·7
Moncalieri	148·0	332	e 44 48	?SR ₁	53 54	?	74·9	—
Tortosa	N. 154·4	336	19 56	[- 5]	—	—	e 71·7	95·6
Algiers	156·5	326	e 20 0	[- 4]	—	—	e 81·7	98·7
Coimbra	157·4	351	20 32	[+27]	34 2	?	e 70·2	—

Additional readings: Melbourne gives also eSR₁ = +13m.28s., SR₂ = +13m.52s.
Perth PR₁ = +9m.28s., SR₁ = +20m.11s., SR₂ = +23m.6s. Batavia i = +19m.31s.
Victoria L = +38·7m. Chicago S? = +34m.15s., L = +64·7m. Toronto eL = +64·4m. Georgetown LE = +63·8m., LN = +65·0m. Ottawa LEV = +73·7m. Konigsberg LN = +73·8m. Hamburg MN = +78·7m. Eskdalemuir eN = +32m.26s. De Bilt MN = +78·9m. Zagreb MNW = +71·7m. Uccle MN = +89·7m. Coimbra eL = +83·7m.

April 11d. 4h. 35m. 10s. Epicentre 40°·5N. 19°·2E. (suggested by Zurich).

A = +·718, B = +·250, C = +·649; D = +·329, E = -·944;
G = +·613, H = +·214, K = -·760.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mostar	3·0	340	1 0 19	-28	1 1 9	-14	—	2·2
Pompeii	3·6	275	1 10 +14	—	1 59 +20	—	—	3·4
Sinj	3·8	330	e 0 15 -44	—	1 1 8 -36	e 1·6	—	1·7
Athens	4·4	125	e 1 12 + 4	—	1 1 58 - 3	—	2·1	2·6
Belgrade	4·4	12	1 0 28 -40	—	1 1 29 -32	—	—	1·6
Rocca di Papa	5·1	286	e 1 20 + 1	—	3 20 ?L	(3·3)	—	3·9

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Zagreb	5.8	337	e 1 37	+ 7	i 3 8	?L	(i 3.1)	5.5
Florence	6.7	302	1 50	+ 8	—	—	—	6.3
Padova	7.3	315	1 35	-16	3 40	+22	4.0	4.8
Vienna	8.0	346	2 8	+ 7	3 36	- 1	i 5.1	6.6
Moncalieri	9.6	302	1 58	-26	4 45	?L	6.0	7.9
Lemberg	9.9	19	—	—	e 4 32	+ 6	e 7.9	8.4
Zurich	10.3	316	e 2 39	+ 5	e 4 36	- 1	—	—
Marseilles	10.7	290	—	—	—	—	5.8	—
Strasbourg	11.5	318	e 3 11	+19	6 27	?L	(6.4)	—
Besançon	11.6	310	5 22	?S	(5 22)	+13	8.8	—
Barcelona	12.9	280	—	—	—	—	e 6.8	11.4
Algiers	13.1	259	e 3 23	+ 9	e 7 8	?L	9.1	12.8
Tortosa N.	14.1	278	—	—	(6 27)	+17	6.4	12.5
Konigsberg N.	14.4	3	3 28	- 4	5 33	-45	—	10.8
Paris	14.4	311	—	—	—	—	e 8.8	8.8
Hamburg	14.5	338	e 3 48	+15	—	—	9.7	10.8
Uccle	14.6	320	e 3 50	+16	—	—	8.5	9.5
De Bilt	15.1	325	—	—	i 6 57	+23	8.7	10.0
Kew	17.3	316	8 50	?L	—	—	(8.8)	12.8
Granada	18.0	267	i 3 49	-28	i 7 22	-18	e 9.2	12.5
Oxford	18.0	316	4 28	+11	7 56	+16	10.5	12.2
Upsala	19.4	356	4 35	+ 1	8 10	0	e 10.3	12.3
Stonyhurst	19.7	320	e 9 20	?L	—	—	(e 9.3)	14.8
Bidston	19.8	318	2 50	-109	—	—	9.5	15.3
Rio Tinto	20.1	270	12 50	?L	—	—	(12.8)	19.8
Eskdalemuir	20.9	322	e 5 41	+49	e 8 46	+ 4	10.8	12.8
Coimbra E.	21.0	278	—	—	e 8 48	+ 4	12.0	18.1
Coimbra N.	21.0	278	—	—	e 8 12	-32	e 9.3	16.7
Edinburgh	21.2	324	—	—	e 9 27	+14	—	13.2
Dyce N.	21.7	328	—	—	—	—	13.8	—

Additional readings : Mostar gives also iPN = +9s. Athens P = +1m.20s.,
 iP = +1m.25s., MN = +2.9m., T₀ = 4h.35m.24s. Belgrade ePN =
 +0m.16s., Rocca di Papa SN = +3m.2s. Zagreb iNW = +1m.44s.,
 and +2m.20s., i = +3m.20s. Padova PR₁ = +3m.50s., SR₁ = +4m.2s.
 Vienna PR₁ = +2m.37s., PS = +3m.13s., SR = +4m.22s. Moncalieri
 MN = +8.2m. Zurich is = +4m.53s. Epicentre 40° 5N. 19° 2E.
 Tortosa readings are given as for 3h. Konigsberg PZ = +3m.20s. Paris
 MN = +11.8m. Hamburg ePE = +3m.59s., ePN = +4m.2s., e =
 +7m.32s., MZ = +10.7m., MN = +11.2m. De Bilt eE = +7m.24s.,
 eN = +7m.38s. Granada MN = +10.4m. Upsala MN = +14.8m.

April 11d. 15h. 43m. 30s. Epicentre 14° 0S. 166° 5E. (as on 1921 Oct. 15d.).

$$A = -.943, B = +.227, C = -.242; D = +.233, E = +.972;$$

$$G = +.235, H = -.056, K = -.970.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	24.2	212	e 5 42	+12	e 10 0	+12	e 12.4	14.8
Sydney	24.2	212	10 0	?S	(10 0)	+12	13.9	15.3
Melbourne	30.5	215	—	—	11 30	-13	16.9	19.8
Manila	53.3	300	e 9 52	+24	—	—	—	—
Zi-ka-wei Z.	62.5	319	10 30	+ 1	e 18 56	+ 1	—	36.3
Ann Arbor E.	114.0	49	—	—	—	—	62.6	—
Ottawa E.	119.3	44	—	—	—	—	e 64.5	—
Eskdalemuir	137.9	351	—	—	—	—	76.5	—
De Bilt E.	139.1	342	—	—	—	—	e 72.5	—
Uccle	140.5	342	—	—	—	—	e 70.5	—
Strasbourg	141.2	336	—	—	—	—	e 27.5	—

Additional readings: Riverview gives also MN = +14.1m., T₀ = 15h.43m.54s.
 Melbourne SR₁ = +14m.0s. Ann Arbor LN = +62.7m. De Bilt eLN =
 +74.5m.

April 11d. Readings also at 2h. (Victoria), 3h. (Vera Cruz), 5h. (Zi-ka-wei),
 7h. (La Paz, Mendoza, Pilar, and Cipolletti), 8h. (Eskdalemuir, De Bilt,
 Stonyhurst, West Bromwich, Uccle, and Bidston), 9h. (Zi-ka-wei),
 10h. (near Tacubaya), 12h. (Riverview), 15h. (near Calcutta), 16h. (near
 Tacubaya (2)).

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April 12d. 8h. 8m. 25s. Epicentre 39°·5N. 145°·0E. (as on 1921 Sept. 27d.).

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

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	N.	3·0	263	0 57	+10	1 42	+19	—	—
Sapporo		4·6	324	0 36	-35	—	—	1·2	—
Tokyo		5·6	229	e 2 39	?S	(e 2 39)	+ 5	e 5·0	—
Ootomari		7·4	348	1 22	-30	—	—	2·0	—
Zi-ka-wei	Z.	20·8	254	e 4 51	0	—	—	—	15·2
Uccle		83·3	336	—	—	—	—	e 41·6	—
Strasbourg		84·2	333	—	—	—	—	e 53·6	—
Rocca di Papa		88·0	326	—	—	—	—	e 50·1	52·2

Mizusawa gives also SE = +1m.40s. Ootomari readings are reduced by 10m.

April 12d. Readings also at 2h. (near Tacubaya), 7h. (near Mostar), 8h. (Zi-ka-wei and Mizusawa), 12h. (Mizusawa and Osaka), 13h. (near Tokyo), 15h. (Strasbourg), 16h., 17h., and 20h. (La Paz).

April 13d. 6h. 7m. 12s. Epicentre 10°·0N. 127°·5E. (as on 1913 April 28d.).

A = -·600, B = +·781, C = +·174 ; D = +·793, E = +·609 ;
G = -·106, H = -·138, K = -·985.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		7·9	307	e 2 1	+ 1	—	—	3·4	4·2
Hong Kong		17·7	315	4 8?	- 5	—	—	—	9·3
Zi-ka-wei		21·9	346	5 5	+ 1	e 9 1	- 2	—	—
Batavia	E.	26·3	232	i 5 51	0	—	—	—	—
Colombo		47·3	267	26 18	?L	—	—	(26·3)	30·8

Additional readings : Manila gives also MN = +4·4m. Batavia i = +11m.26s.

April 13d. 15h. 12m. 10s. Epicentre 60°·0N. 110°·0W.

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

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	E.	13·5	268	e 5 53	?S	(e 5 53)	- 3	6·3	6·4
Chicago		22·8	132	e 3 50	?	7 53	-88	—	—
Berkeley		23·5	205	e 6 15	+52	—	—	—	—
Ann Arbor	E.	23·9	126	—	—	9 56	+14	—	10·8
	N.	23·9	126	—	—	9 26	-16	—	13·5
St. Louis		24·7	141	e 5 38	+ 3	10 2	+ 5	—	—
Ottawa		24·9	110	e 7 35	+118	i 9 50	-11	e 12·1	—
Ithaca		26·8	116	—	—	e 10 38	+ 1	—	—
Northfield		27·3	108	—	—	e 10 50	+ 4	—	—
Georgetown	E.	29·5	121	e 8 12	?	e 12 27	+61	—	—
Ottawa	N.	29·5	121	e 8 9	?	e 12 23	+57	—	—
Washington	E.	29·5	121	e 5 50	-33	—	—	—	—
Cheltenham	N.	29·7	121	e 10 45	?S	(e 10 45)	-44	12·6	13·3
	N.	29·7	121	e 11 22	?S	(e 11 22)	- 7	12·9	13·0
Stonyhurst		52·4	45	—	—	—	—	—	25·8
Bldston		52·5	45	—	—	—	—	—	18·8
De Bilt		56·4	42	—	—	—	—	e 23·8	25·8
Zi-ka-wei	Z.	79·5	317	—	—	—	—	e 28·4	—

Additional readings and notes : Sitka gives also ePN = +6m.1s., all readings are increased by 10m. Ottawa i = +11m.0s. and +11m.50s. De Bilt MN = +26·1m.

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April 13d. Readings also at 0h. (Apia), 3h. (2) and 5h. (near Tacubaya), 10h. (Riverview and near Mizusawa), 14h. (Tortosa and near Tacubaya), 16h. (Zagreb and Rocca di Papa), 19h. (near Tacubaya), 21h. (near Athens).

April 14d. Readings at 4h. (Apia), 5h. (near Port au Prince).

April 15d. Readings at 0h. (Manila and near Tokyo), 5h. (Apia), 7h. (near Manila and near La Paz), 10h. (Zagreb and near La Paz), 16h. (near Tokyo), 17h. (Rocca di Papa), 21h. (near Mostar), 23h. (Denver).

April 16d. 13h. 7m. 6s. Epicentre 3°-0S. 24°-0E.

A = +.912, B = +.406, C = -.052; D = +.407, E = -.914;
G = -.048, H = -.021, K = -.999.

Very roughly.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	m.	s.	m.	s.	m.	s.	m.	m.
Johannesburg	23.5	171	4 18	-65	—	—	—	10.4
Capetown	31.4	189	—	—	e 11 24	-34	i 14.7	14.9
Helwan	33.6	13	e 7 2	+ 1	12 33	- 1	—	20.4
Algiers	44.3	338	—	—	—	—	e 25.2	32.2
Rocca di Papa	45.9	349	e 8 12	-27	e 16 0	+33	e 31.2	37.5
Granada	47.6	330	9 20	+29	—	—	—	35.1
Florence	48.1	349	27 24	?L	—	—	(27.4)	36.4
San Fernando	E. 48.4	328	—	—	—	—	—	31.9
Barcelona	N. 48.7	340	—	—	e 16 2	0	e 28.8	35.0
Tortosa	48.8	337	—	—	—	—	e 24.9	31.8
Zagreb	49.3	354	e 9 4	+ 2	—	—	e 27.9	35.9
Moncalieri	50.1	347	e 9 15	+ 7	16 55	+35	30.7	37.2
Vienna	51.6	355	19 18	+ 1	i 13 1	?PR _i	e 34.9	39.4
Coimbra	52.4	330	—	—	—	—	e 31.4	37.7
Besançon	52.7	346	—	—	—	—	34.9	—
Strasbourg	53.5	348	—	—	—	—	e 37.9	—
Kodalkanal	54.8	77	—	—	—	—	24.6	28.7
Paris	55.1	344	—	—	e 24 54	?L	32.9	37.9
Uccle	56.3	348	—	—	—	—	e 24.9	—
Colombo	E. 56.6	80	8 36	-74	14 42	-179	27.2	31.2
De Bilt	N. 57.3	349	—	—	e 18 30	+40	e 33.9	41.8
Hamburg	57.8	350	—	—	—	—	e 35.9	44.5
Konigsberg	57.9	358	—	—	—	—	e 37.9	—
Kew	58.2	343	35 54	?	—	—	39.7	—
Oxford	58.8	342	—	—	—	—	—	40.9
Bidston	60.8	343	—	—	30 7	?L	(30.1)	44.2
Simla	N. 61.0	52	—	—	e 24 24	?	—	—
Stonyhurst	61.0	343	—	—	—	—	—	42.9
Eskdalemuir	62.9	343	—	—	—	—	33.9	44.1
Edinburgh	62.9	343	—	—	—	—	—	44.9
La Paz	91.2	255	e 17 22	?PR _i	—	—	47.9	58.3
Toronto	101.8	315	—	—	—	—	e 59.8	67.9
Chicago	108.0	313	—	—	—	—	e 53.1	—
Melbourne	112.0	133	e 49 6	?	—	—	54.3	58.1
Riverview	118.2	131	—	—	—	—	e 58.0	64.8
Victoria	126.7	333	—	—	—	—	68.9	78.3

Additional readings: Algiers gives also i = +26m.54s. Rocca di Papa
eP = +8m.36s. Granada MN = +34.3m. San Fernando MN = +35.4m.
Zagreb MNW = +37.9m. Stonyhurst eP = 12h.50m.30s. Toronto
eL = +62.1m. Victoria eL = +76.6m. Riverview MN = +64.9m.

April 16d. Readings also at 1h. (La Paz), 6h. (Zagreb and near Belgrade), 10h. (near Tokyo), 15h. (Azores), 18h. (La Paz), 21h. and 23h. (Manila).

April 17d. Readings at 1h. (Rocca di Papa), 2h. (Manila, Taihoku, and Zi-ka-wei), 5h. (Colombo), 7h. (Ottawa, Ann Arbor, Kingston, and Washington), 14h. (Azores), 15h. (Tortosa), 19h. (Manila), 20h. (near Batavia), 21h. (Manila).

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April 18d. Readings at 4h. (Vera Cruz), 5h. (Manila), 8h. (La Paz), 11h. (near Tacubaya), 15h. (near Tiflis and near Belgrade), 17h. (Zagreb and Vienna) 20h. (Tiflis), 21h. (La Paz).

April 19d. Readings at 9h. (near Mizusawa and Puebla), 16h. (Batavia), 19h. (Tiflis, Manila, and Batavia), 22h. (near Belgrade).

April 20d. 5h. 43m. 18s. Epicentre $15^{\circ}5'N$. $101^{\circ}2'W$.

$$A = -.187, B = -.945, C = +.267; \quad D = -.981, E = +.194;$$

$$G = -.052, H = -.262, K = -.964.$$

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m.	m.
Tacubaya	E.	4.3	25	2 14	?S	(2 14)	+16	3.3	3.6
	N.	4.3	25	2 10	?S	(2 10)	+12	3.3	3.6
Vera Cruz	E.	6.1	52	1 40	+ 7	(2 34)	-12	2.6	3.1
	Z.	6.1	52	1 38	+ 5	(2 33)	-13	2.5	2.9
Mazatlan		9.1	329	—	—	—	—	13.6	—
Tucson	E.	18.9	334	11 57	?L	—	—	12.4	12.6
Chicago		28.8	21	6 15	- 1	11 12	- 1	17.7	—
Berkeley		29.1	324	—	—	e 17 52	?L	e 20.6	—
Ann Arbor	N.	30.7	27	—	—	(11 42)	- 4	11.7	—
Washington		31.6	38	—	—	10 42	-79	—	—
Toronto		33.7	30	—	—	—	—	25.8	—
Ottawa		36.7	31	e 7 26	- 2	e 12 57	-23	e 25.7	—
Victoria		37.6	337	—	—	—	—	21.0	24.9
La Paz		45.7	134	8 38	0	—	—	18.2	19.2
Mendoza		57.7	147	20 30	?S	(20 30)	+155	22.0	22.9
Cipolletti		62.6	151	20 54	?S	(20 54)	+118	22.1	22.9
Chacarita	E.	64.5	142	27 0	?L	—	—	27.7	27.9
De Bilt		87.4	36	—	—	—	—	e 57.7	—

Additional readings: Tucson gives also LN = +12.5m., MN = +15.0m.
 Toronto L? = +44.5m.? Chacarita PN = +16m.54s.

April 20d. 10h. 22m. 10s. Epicentre $36^{\circ}0'N$. $21^{\circ}5'E$. (as on 1917 April 27d.).

$$A = +.753, B = +.297, C = +.588; \quad D = +.366, E = -.930;$$

$$G = +.547, H = +.215, K = -.809.$$

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m.	m.
Athens		2.6	46	i 0 40	- 1	i 1 11	- 1	—	1.2
Belgrade		8.8	355	e 2 42	+29	e 3 29	-29	4.2	—
Rocca di Papa		9.0	313	2 44	+28	—	—	—	5.8
Helwan		10.2	124	i 2 50	+17	—	—	—	2.9
Zagreb		10.8	339	e 3 24	+43	e 5 11	+21	e 5.2	6.5
Innsbruck		13.6	329	e 6 8	?S	(e 6, 8)	+10	—	—
De Bilt		19.9	329	—	—	—	—	e 9.3	—

Additional readings: Belgrade gives also L = +5.4m. Readings all increased by 4m.
 Rocca di Papa gives also PN = +3m.38s. Zagreb MNW = +7.0m.

April 20d. Readings also at 3h. and 6h. (2) (La Paz), 7h. (Belgrade), 13h. (Zi-ka-wei (2), Taihoku (3), and Manila), 18h. (near Mizusawa).

April 21d. Readings at 4h. and 6h. (near Tokyo), 10h. (La Paz), 19h. (near Taihoku).

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April 22d. Readings at 0h. (Zagreb), 2h. (near Batavia), 8h. (Zi-ka-wei), 10h. (Manila, Zi-ka-wei, and Batavia), 21h. (Colombo, Melbourne, Riverview, Batavia, and Manila).

April 23d. 5h. 4m. 44s. Epicentre 35°·5N. 142°·5E.

A = -·646, B = +·496, C = +·581.

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	2·2	i 0 34	0	i 1 0	0	—	1·6
Mizusawa E.	3·8	1 4	+ 5	1 25	-19	—	—
Nagoya	4·5	1 16	+ 6	—	—	—	—
Osaka	5·8	—	—	2 32	- 7	3·5	4·5
Zi-ka-wei z.	18·1	e 4 37	+19	—	—	—	12·1

Additional readings: Tokyo gives also MN = +1·4m. Mizusawa SN = +1m.26s.

April 23d. 21h. 30m. 36s. Epicentre 12°·5N. 124°·5E. (as on 1921 May 23d.).

A = -·553, B = +·805, C = +·216; D = +·824, E = +·566;

G = -·123, H = +·178, K = -·976.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	4·0	302	e 1 2	0	(1 40)	-10	1·7	1·9
Taihoku	12·8	348	e 4 24	+74	—	—	—	—
Hong Kong	13·9	316	3 18	- 7	(6 24)	+18	6·4	6·9
Zi-ka-wei	18·9	352	4 30	+ 2	8 4	+ 4	—	13·3
Osaka	24·3	22	6 33	+62	—	—	—	11·6
Batavia	25·6	224	i 5 45	+ 1	i 10 2	-12	e 20·4	—
Riverview	52·8	151	e 10 22	+57	e 18 2	+68	e 22·8	27·4
Zagreb	93·5	320	—	—	—	—	e 47·4	61·4
Hamburg	93·9	327	—	—	—	—	e 55·4	—
De Bilt	97·1	327	—	—	—	—	e 49·4	53·8
Strasbourg	97·5	323	—	—	—	—	e 52·4	—
Uccle	98·2	326	—	—	—	—	e 49·4	54·5
Edinburgh	99·0	333	51 24	?L	—	—	(51·4)	—
Eskdalemuir	99·3	333	—	—	e 32 24	?SR ₁	45·4	54·3
Stonyhurst	99·9	330	e 36 24	?SR ₁	—	—	—	58·9
Kew	100·2	329	—	—	—	—	—	63·4
Paris	100·2	325	—	—	e 44 24	?	53·4	54·4
Bidston	100·4	330	—	—	44 54?	?	—	57·4
Oxford	100·7	329	—	—	—	—	—	58·6
Rio Tinto	112·1	320	55 24	?L	—	—	(55·4)	60·4
La Paz	167·1	110	20 44	[+31]	—	—	—	—

Additional readings: Zi-ka-wei gives also MZ = +13·7m. Osaka MN = +12·7m. Batavia i = +6m.28s., +7m.27s., and +15m.3s. Riverview MN = +34·4m. All readings given for 24d. Zagreb MNW = +52·4m. De Bilt MN = +52·0m. Eskdalemuir MN = +54·5m. Rio Tinto readings given as on 24d.

April 23d. Readings also at 0h. (Riverview and Zi-ka-wei), 5h. (Zi-ka-wei), 11h. (near Osaka and Kobe), 22h. (Manila).

April 24d. Readings at 2h. (near Tacubaya), 3h. (Vera Cruz), 5h. (Manila), 9h. (Manila and near Athens), 16h. (near Tokyo), 18h. (near Belgrade), 23h. (Lick, Rocca di Papa, Zi-ka-wei, and near Taihoku).

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1922. April 25d. 21h. 19m. 0s. Epicentre 13°0S. 166°8E.

(as on 1920 Dec. 16d.).

A = -·949, B = +·222, C = -·225; D = +·228, E = +·974;
G = +·219, H = -·051, K = -·974.

	Δ	Az.	P.		O-C.		S.	O-C.		L.	M.
			m. s.	s.	m. s.	s.		m. s.	m.		
Apia	20·8	95	4	50	-	1	9	10	+30	(9·2)	12·0
Riverview	25·2	213	e 5	31	-	9	e 10	21	+14	e 10·7	14·8
Sydney	25·2	213	5	36	-	4	10	12	+5	13·3	14·7
Melbourne	31·5	214	6	30	-	13	11	36	-24	15·5	20·0
Adelaide	33·6	224	e 7	0	-	1	(i 12	24)	-10	i 12·4	—
Honolulu	N. 48·6	46	—	—	—	—	14	18	-103	25·9	47·6
Perth	50·3	239	8	50	-	19	16	10	-13	27·3	33·1
Manila	53·2	300	e 9	35	+ 8	—	(16	50)	- 9	16·8	17·5
Taihoku	58·3	311	—	—	—	—	e 18	5	+ 2	—	—
Batavia	59·4	270	e 10	7	-	1	—	—	—	e 25·0	—
Zi-ka-wei	62·1	316	10	16	-	10	e 18	22	-27	—	36·1
Hong Kong	62·5	304	10	20	-	9	—	—	—	—	23·2
Berkeley	83·5	49	—	—	—	—	—	—	—	e 42·5	—
Lick	N. 83·8	50	—	—	—	—	—	—	—	e 41·7	—
Victoria	86·9	36	—	—	—	—	(22	14)	-86	e 41·6	45·0
Colombo	88·7	277	24	0	?S	—	(24	0)	0	40·0	41·0
Tucson	E. 90·5	57	—	—	—	—	—	—	—	e 44·2	71·9
Kodalkanal	91·6	280	16	36	?PR ₁	—	—	—	—	57·6	64·8
Cipolletti	107·0	138	63	48	?L	—	—	—	—	(63·8)	—
Mendoza	110·2	133	27	48	?S	—	(27	48)	+18	55·3	89·4
Chicago	110·2	49	25	18	?S	—	(25	18)	-132	49·0	—
Ann Arbor	113·1	49	—	—	—	—	—	—	—	59·7	62·0
Pilar	E. 114·0	134	31	42	?SR ₁	—	—	—	—	58·4	70·8
	N. 114·0	134	31	18	?SR ₁	—	—	—	—	57·5	88·1
Toronto	116·1	47	—	—	—	—	(30	42)	+143	e 62·0	90·3
La Paz	118·1	117	—	—	—	—	e 28	22	-13	78·9	84·6
Ithaca	118·3	48	—	—	—	—	—	—	—	63·0	—
Georgetown	E. 118·4	51	—	—	—	—	—	—	—	63·0	—
Washington	118·4	51	—	—	—	—	—	—	—	e 62·0	—
Ottawa	118·4	45	—	—	—	—	e 24	50	-227	65·0	—
Cheltenham	E. 118·5	51	—	—	—	—	—	—	—	e 82·8	86·5
Johannesburg	124·0	225	—	—	—	—	—	—	—	60·0	—
Konigsberg	130·6	335	i 19	17	[- 3]	—	i 39	44	?SR ₁	e 72·0	74·0
Hamburg	135·5	340	e 19	24	[- 7]	—	i 39	51	?SR ₁	e 67·0	84·0
Edinburgh	136·4	352	76	0	?L	—	—	—	—	(76·0)	—
Eskdalemuir	137·0	352	22	12	?PR ₁	—	39	30	?SR ₁	65·0	109·7
Vienna	137·1	331	19	25	[- 9]	—	34	0	?	—	—
De Bilt	E. 138·2	343	e 23	8	?PR ₁	—	—	—	—	e 66·0	89·2
	N. 138·2	343	e 22	22	?PR ₁	—	—	—	—	—	83·5
Stonyhurst	138·3	351	e 23	0	?PR ₁	—	—	—	—	—	95·5
Bidston	138·8	349	32	10?	?S	—	44	24	?SR ₁	—	85·0
Zagreb	139·0	328	—	—	—	—	e 23	0	?PR ₁	83·0	—
Ucele	139·6	343	e 22	30	?PR ₁	—	—	—	—	—	80·0
Innsbruck	140·0	334	e 40	4	?SR ₁	—	e 43	1	?	e 47·4	—
Oxford	140·0	349	i 19	50	[+11]	—	—	—	—	—	124·5
Kew	140·1	348	—	—	—	—	—	—	—	—	122·0
Strasbourg	V. 140·4	338	e 19	24	[-16]	—	i 40	1	?SR ₁	e 73·0	104·0
Paris	141·9	345	—	—	—	—	e 41	0	?SR ₁	80·0	106·0
Florence	142·8	330	93	30	?L	—	—	—	—	(93·5)	—
Moncalieri	143·4	335	e 20	54	[+68]	—	29	45	?	—	—
Tortosa	N. 149·7	339	19	0	[-55]	—	—	—	—	e 62·0	—
Coimbra	152·5	352	e 7	0	?	—	e 21	0	?PR ₁	43·0	—
Granada	154·3	342	i 20	21	[+20]	—	28	31	?	—	—
Rio Tinto	154·5	348	76	0	?L	—	—	—	—	(76·0)	96·0
San Fernando	155·7	346	20	30	[+27]	—	—	—	—	—	117·0

Additional readings and notes: Riverview gives also PR₁ = +6m.39s., eS = +9m.42s., MN = +14·1m., MZ = +17·7m., T₀ = 21h.19m.13s. Melbourne SR₁ = +13m.54s. Honolulu ePR₁N = +21m.0s. Perth PR₂ = +10m.29s., PR₄ = +11m.40s., SR₁ = +18m.45s. Batavia i = +17m.10s., iN = +19m.1s. Zi-ka-wei MN = +35·8m., MZ = +36·2m. Berkeley eEZ = +29m.55s., eE = +40m.5s., eNZ = +41m.35s., eENZ = +63m.35s. Lick iN = +64m.38s. Victoria eL = +65·3m. Colombo S = +34m.30s. Tucson LE = +54·2m. and +67·1m. Chicago PR₁ = +23m.33s., S = +35m.0s., L = +54·0m., +59·0m., and +69·0m. Toronto eL = +72·4m. and +87·8m. La Paz S = +41m.32s. Ithaca L = +82·0m. Georgetown LN = +65·0m., LE = +86·0m. Washington L = +75·0m. Ottawa eE = +29m.56s., +37m.0s., and +45m.0s. Konigsberg EN = +22m.44s., EZN = +43m.7s. Hamburg iZ = +43m.25s. Eskdalemuir MN = +85·9m. Vienna PR₁ = +22m.14s. Bidston P = +34m.20s. Strasbourg iV = +43m.0s. Paris MN = +86·0m. Florence P has been increased by 2h. Coimbra LN = +45·0m. San Fernando MN = +90·5m.

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April 25d. 21h. 39m. 30s. Epicentre 13°·0S. 166°·8E. (as for previous shock).

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	20·8	95	4 53	+ 2	9 30	+50	—	12·6
Riverview	25·2	213	e 5 52	+12	e 9 54	-13	—	16·5
Melbourne	31·5	214	—	—	12 0	0	16·6	19·5
Manila	53·2	300	e 9 56	+29	(16 42)	-17	16·7	16·9
Batavia	59·4	270	e 10 2	—	—	—	e 28·6	—
Budapest	136·3	328	i 21 44	?PR ₁	e 32 33	?	—	—
Edinburgh	136·4	352	116 30	?	—	—	—	—
Vienna	137·1	331	19 24	[-10]	—	—	e 51·5	73·0
Innsbruck	140·0	334	53 57	?L	—	—	(e 54·0)	—
Strasbourg	140·4	338	—	—	—	—	e 52·5	83·5
Moncalieri	143·4	335	20 10	[+24]	31 15	?	56·0	68·0
Tortosa N.	149·7	339	19 51	[- 4]	—	—	—	100·4
Algiers	152·1	332	—	—	—	—	e 73·5	96·5
Granada	154·3	342	i 20 4	[+ 3]	32 17	?	e 66·0	74·7

Additional readings: Riverview gives also PS = +10m.16s., MN = +17·0m.,
 MZ = +17·4m., T₀ = 21h.40m.16s. Melbourne SR₁ = +14m.6s. Batavia
 iN = +17m.29s., i = +21m.55s. Vienna PR₁? = +22m.5s., SR₁? =
 +33m.12s.

April 25d. 22h. 21m. 25s. Epicentre 46°·0N. 149°·0E. (as on 1920 Oct. 18d.).

A = -·596, B = +·358, C = +·719; D = +·515, E = +·857;
 G = -·617, H = +·370, K = -·695.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	4·4	281	(1 8)	—	—	—	1·1	3·0
Mizusawa E.	8·9	223	2 14	- 1	4 1	0	—	—
Tokyo	12·4	218	—	—	—	—	e 7·6	—
Zi-ka-wei	25·9	245	e 5 33	-14	e 10 41	+21	—	17·3
Taihoku	30·3	235	—	—	e 9 25	-134	—	—
Vienna	77·2	330	11 52	-10	—	—	—	45·6

Additional readings: Ootomari gives eP = 22h.17m.52s. Mizusawa SN =
 +4m.4s. Zi-ka-wei MN = +15·8m., MZ = +17·2m. Vienna i =
 +15m.41s.

April 25d. Readings also at 1h. (near Lick), 4h. (near Tokyo), 5h. (Chur and Zurich), 8h. (Manila), 11h. (Florence), 20h. (near Athens), 22h. (near Lick).

April 26d. 1h. 11m. 25s. Epicentre 35°·0N. 139°·5E. (as on 1921 Oct. 2d.).

A = -·623, B = +·532, C = +·574; D = +·649, E = +·760;
 G = -·436, H = +·372, K = -·819.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	0·7	16	i 0 11	0	i 0 21	+ 1	—	0·4
Nagoya	2·1	274	0 40	+ 7	—	—	—	—
Osaka	3·4	266	0 59	+ 6	—	—	1·8	2·6
Kobe	3·6	266	1 1	+ 5	1 22	-17	2·0	2·3
Mizusawa E.	4·3	17	1 4	- 3	1 52	- 6	—	—
Nagasaki	8·4	257	2 2	- 5	—	—	4·1	4·9
Ootomari	11·9	11	2 43	-15	—	—	4·6	6·1
Zi-ka-wei	15·6	261	i 3 45	- 2	e 6 43	- 3	—	10·4
Taihoku	18·4	242	e 4 20	- 2	(7 54)	+ 5	7·9	—
Hong Kong	25·5	247	5 40	- 3	—	—	—	14·8
Manila	26·4	224	e 6 5	+13	e 10 44	+14	e 12·8	14·1
Honolulu N.	55·8	87	17 29	?S	(17 29)	- 2	24·7	27·6
Riverview	69·7	170	—	—	—	—	e 35·6	—
Upsala	73·9	334	e 11 35	- 6	21 1	-12	e 40·2	48·5
Konigsberg N.	76·1	329	—	—	i 21 27	-11	e 40·6	46·6

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.
Hamburg	81.3	333	i 12 16	-11	e 22 35	-3	e 43.6	48.6
Vienna	82.6	326	12 23	-11	e 21 33	-80	—	53.1
Edinburgh	83.7	340	—	—	—	—	—	49.6
Eskdalemuir	84.2	340	—	—	—	—	38.6	53.7
De Bilt	84.2	334	—	—	22 52	-18	e 43.6	49.6
N.	84.2	334	—	—	—	—	e 46.6	53.4
Zagreb	84.5	324	—	—	—	—	42.6	—
Stonyhurst	85.3	339	e 51 35	?L	—	—	e (51.6)	55.1
Uccle	85.5	334	e 12 38	-13	e 23 0	-25	e 43.6	—
Innsbruck	85.5	328	(e 12 47)	-4	e 12 47	?P	—	—
Bidston	85.8	339	—	—	42 12?	?L	(42.2)?	55.6
Strasbourg	86.1	330	—	—	—	—	e 46.6	—
Kew	86.6	337	—	—	—	—	—	50.6
Oxford	87.0	337	—	—	—	—	—	52.0
Paris	87.9	333	—	—	—	—	e 48.6	53.6
Florence	88.2	325	47 5	?L	—	—	(47.1)	50.6
Moncalieri	88.9	328	—	—	e 41 15	?L	50.2	—
Chicago	91.9	33	—	—	e 23 5	-89	47.6	—
Ottawa	93.6	23	—	—	—	—	e 48.6	—
Tortosa	95.3	330	e 23 35	?S	(e 23 35)	-94	e 49.6	65.0
Coimbra	99.2	335	e 32 35	?SR ₁	—	—	72.6	—
La Paz	149.2	60	18 52	[-62]	—	—	72.4	—

Additional readings and notes : Osaka gives also MN = +2.7m. Kobe MN = +2.2m. Mizusawa SN = +1m.53s. Zi-ka-wei PSZ = +7m.7s. Manila MN = +13.7m. Honolulu S = +21m.51s. Vienna PR,Z = +15m.58s., i = +23m.59s. and +24m.11s. Eskdalemuir e = +11m.5s., +14m.29s., +22m.45s., and +28m.27s., MN = +53.5m. Stonyhurst eP (=L) has been increased by 1h. Toronto ($\Delta = 93^\circ 7'$), L = 1h.11m.54s. and 1h.13m.36s. Coimbra readings have been increased by 1h.

April 26d. 3h. 59m. 0s. Epicentre $45^\circ 3'N$. $153^\circ 5'E$. (as on 1920 Sept. 21d.).

A = -630, B = +314, C = +711 ; D = +446, E = +895 ; G = -636, H = +317, K = -703.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	7.6	284	1 58	+3	(3 33)	+7	3.6	4.6
Tokyo	14.2	232	i 4 0	+31	i 8 8	?L	e 11.1	26.5
Nagoya	16.1	237	3 37	-16	—	—	—	—
Osaka	17.4	239	4 21	+11	11 14	?	—	17.5
Kobe	17.6	239	e 4 28	+16	e 11 20	?	16.2	17.7
Nagasaki	22.1	244	5 20	+14	(9 24)	+17	(11.2)	—
Zi-ka-wei	28.6	252	i 6 11	-3	e 11 3	-7	e 15.5	24.3
Taihoku	32.7	242	—	—	e 14 10	?	19.4	—
Hong Kong	39.4	245	7 40	-10	—	—	—	31.5
Manila	41.2	233	e 8 14	+9	—	—	16.4	—
Honolulu	46.1	103	15 39	?S	(15 39)	+10	26.5	30.2
Victoria	54.1	55	—	—	16 23	-47	22.8	36.2
N.	59.4	285	16 18	?	30 12	?L	e 38.5	38.8
Stimla	60.5	65	—	—	e 16 25	?	e 25.0	—
Berkeley	60.9	65	—	—	e 15 41	?PR ₁	i 24.9	—
Lick	66.2	233	—	—	e 16 54	?	i 25.8	—
Batavia	68.9	338	11 12	+2	20 11	-2	e 35.2	51.1
Upsala	72.3	334	i 11 29	-3	20 52	-2	e 37.7	51.8
Konigsberg	72.3	313	—	—	—	—	e 44.0	—
Tiflis	73.0	269	26 0	?SR ₁	—	—	—	56.6
Kodaikanal	75.3	330	e 12 0	+9	—	—	e 38.2	54.0
Lemberg	76.4	339	e 11 56	-1	i 17 58	?PR ₁	e 39.0	49.0
Hamburg	77.0	348	22 0	?S	(22 0)	+11	—	—
Edinburgh	77.3	42	20 26	?S	(20 26)	-86	36.2	—
Chicago	77.5	348	e 12 3	-1	i 21 54	-1	38.0	57.4
Eskdalemuir	78.7	39	—	—	—	—	53.4	74.5
N.	78.8	346	e 18 30	?PR ₁	28 12	?SR ₁	49.6	53.5
Stonyhurst	78.9	340	e 12 14	+2	22 8	-3	e 42.0	51.4
De Bilt	79.1	330	e 12 47	+33	i 18 14	?PR ₁	e 28.0	—
Budapest	79.2	182	e 12 12	-2	—	—	e 41.3	56.5
Riverview	79.3	346	e 12 20	+5	19 14	?	—	38.6
Bidston	79.3	346	e 12 16	+1	22 33	+18	e 44.0	53.0
Vienna	79.3	333	—	—	e 33 12	?	e 51.5	55.8
Toronto	79.4	36	—	—	e 22 4	-14	e 43.0	—
E.	79.5	32	—	—	—	—	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	e	o	m. s.	s.	m. s.	s.	m.	m.
Uccle	80.3	341	e 12 17	-4	e 22 22	-5	e 40.0	52.9
Oxford	80.6	346	17 25	?PR ₁	i 22 30	0	—	61.6
Kew	80.6	345	—	—	—	—	—	62.0
Zagreb	81.5	331	—	—	—	—	e 46.0	54.0
Strasbourg	81.6	338	i 12 20	-8	22 34	-8	38.0	55.8
Innsbruck	81.6	336	e 12 27	-1	e 22 38	-4	e 43.9	58.4
Ithaca	81.9	35	—	—	—	—	51.0	—
Paris	82.6	342	—	—	e 28 42	?SR ₁	44.0	53.0
Besançon	83.2	339	—	—	e 29 26	?SR ₁	47.0	—
Georgetown	84.3	37	e 15 24	?	23 6	-5	e 29.1	—
Washington	84.3	37	e 18 30	?PR ₁	—	—	e 54.0	—
Moncalieri	84.8	337	12 41	-6	22 59	-18	32.0	60.5
Florence	84.9	334	13 0	+13	—	—	—	61.0
Rocca di Papa	86.3	332	—	—	—	—	55.5	70.0
Helwan	88.4	314	1 13 3	-4	29 30	?SR ₁	56.5	63.6
Tortosa	N. 90.6	341	e 18 0	?PR ₁	—	—	e 48.0	60.8
Coimbra	93.1	347	—	—	e 47 30	?L	71.0	86.5
Algiers	93.8	337	—	—	—	—	e 55.0	60.0
Rio Tinto	95.0	346	57 0	?L	—	—	(57.0)	64.5
Granada	95.0	343	17 43	?PR ₁	—	—	e 53.3	60.5
San Fernando	E. 96.3	345	—	—	—	—	—	75.0
La Paz	134.9	62	e 19 59	[+29]	e 34 9	?	71.8	87.8

Additional readings and notes: Ootomari gives also MN = +4.1m. Kobe MN = +18.9m. Nagasaki gives its L as the P of another shock, for which the L = +15.4m. Zi-ka-wei SR₁Z = +13m.24s., MN = +21.9m., MZ = +29.5m. Honolulu S = +21m.31s., MN = +21.8m. Berkeley eE = +16m.35s. Upsala I = +17m.11s., MN = +53.8m. Konigsberg PR₁? = +17m.38s., PSN = +21m.41s., 1N = +27m.47s., MNZ = +52.0m. Hamburg MN = +54.9m., MZ = +56.0m. Chicago S = +27m.42s., L = +45.0m. Eskdalemuir e = +18m.2s., I = +27m.52s., MN = +61.1m. Ann Arbor LE = +49.5m. All readings increased by 1h. De Bilt SR₁ = +28m.7s., MN = +58.9m. Riverview MN = +49.0m. Bidston P = +13m.15s. Vienna IPZ = +12m.17s., PR₁ = +18m.15s., I = +20m.8s., SR₁ = +28m.58s., eLZ = +46.0m., MZ = +58.0m. Toronto eL = +57.3m. Ottawa eE = +18m.48s. and +28m.8s., e = +74m.52s. Uccle e = +18m.18s., MN = +59.7m. Oxford I = +28m.28s. Strasbourg MN = +50.0m. Innsbruck PR₁ = +18m.27s., SR₁NW = +28m.37s., MNW = +50.9m. Paris MN = +60.0m. Washington L = +66.0m. Moncalieri MN = +57.7m. Helwan PR₁? = +23m.33s. Coimbra all readings have been increased by 1h. Granada MN = +64.0m. San Fernando MN = +64.0m. La Paz L = +30.8m.

April 26d. Readings also at 0h. (Riverview), 2h. (Granada and near Tokyo (2)), 3h. (near Tokyo (2) and near Athens), 4h. (Tokyo, Mizusawa, and near Taubaya), 5h. (Mendoza, Pilar, Mazatlan, and near Tokyo), 19h. (Manila), 20h. (Zi-ka-wei), 23h. (Colombo).

April 27d. 9h. 15m. 30s. Epicentre 40° 0'N. 138° 0'E.

A = -569, B = +513, C = +643; D = +669, E = +743;
G = -478, H = +430, K = -766.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	e	o	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E. 2.6	110	0 42	+1	1 14	+2	—	—
Nagoya	4.9	190	0 58	-18	(1 50)	-24	1.8	2.3
Osaka	5.7	202	1 43	+15	—	—	2.8	3.5
Kobe	5.8	204	1 29	-1	2 20	-19	2.9	3.9
Nagasaki	9.8	225	3 15	+48	—	—	5.0	—
Zi-ka-wei	16.0	242	e 4 0	+8	—	—	—	—
Manila	29.4	215	e 7 17	+55	—	—	—	—
De Bilt	E. 79.2	333	—	—	—	—	e 46.5	56.4
	N. 79.2	333	—	—	—	—	e 44.5	53.6
Uccle	80.5	333	—	—	—	—	—	45.5
Bidston	80.7	337	—	—	—	—	—	56.5
Strasbourg	81.1	330	—	—	—	—	e 50.5	—
La Paz	147.4	50	e 19 35	[-17]	—	—	—	—

Additional readings: Mizusawa gives also PN = +44s. Osaka MN = +3.4m. Kobe MN = +3.1m.

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April 27d. Readings also at 12h. (Tacubaya), 13h. (Athens), 14h. and 16h. (La Paz), 18h. (Athens, Taihoku, Manila, and Zi-ka-wei), 21h. (near Athens).

April 28d. 6h. 38m. 36s. Epicentre $41^{\circ}08.178^{\circ}5E$.

$A = -.754, B = +.020, C = -.656; D = +.026, E = +1.000;$
 $G = +.656, H = -.017, K = -.755.$

	Δ	Az.	P.	O=C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Christchurch	5.0	238	1 18	+ 1	2 18	+ 1	3.4	5.0
Riverview	22.7	280	(e 4 55)	-18	e 4 55	?P	e 7.9	9.7
Sydney	22.7	280	5 54	+41	(9 18)	- 1	9.3	10.4
Melbourne	25.9	266	6 30	+43	(10 24)	+ 4	10.4	14.7
Apia	28.5	20	8 24	?	—	—	—	—
Cipolletti	79.7	133	38 30	?L	—	—	(38.5)	46.4
Mendoza	83.8	129	37 48	?L	—	—	39.2	46.3
Pilar	E. 86.9	131	33 6	?	—	—	47.2	50.4
	N. 86.9	131	26 18	?	—	—	—	47.7
La Paz	95.6	118	e 12 53	-54	—	—	54.2	56.4
Kodaikanal	105.0	271	51 18	?L	—	—	(51.3)	—
Chicago	118.4	58	45 24	?	—	—	54.4	—
Ottawa	127.5	59	—	—	—	—	e 58.4	—
Eskdalemuir	165.7	4	—	—	—	—	84.4	—
Bidston	167.6	4	—	—	—	—	—	93.9
De Bilt	E. 168.0	340	—	—	e 39 36	? e 87.4	e 87.4	92.0
	N. 168.0	340	—	—	e 34 24	? e 86.4	e 86.4	90.6
Uccle	169.4	340	—	—	—	—	—	85.4
Strasbourg	170.0	323	—	—	—	—	e 91.4	—
Tortosa	N. 178.4	263	—	—	—	—	e 91.4	102.8

Additional readings: Riverview gives also eP=6h.39m.4s. and 6h.39m.54s.,
 MN = +9.2m., MZ = +9.4m. Ottawa L = +65.4m.

April 28d. 17h. 5m. 0s. Epicentre $37^{\circ}2N. 139^{\circ}0E$. (as on 1922 Jan. 23d.).

$A = -.601, B = +.522, C = +.605.$

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	1.7	i 0 15	-11	i 0 36	-12	—	0.6
Mizusawa	E. 2.5	0 24	-15	0 50	-19	—	—
	N. 2.5	0 23	-16	0 43	-26	—	—
Nagoya	2.7	0 44	+ 2	—	—	1.5	2.0
Osaka	3.9	—	—	1 47	0	2.6	3.7
Kobe	4.0	2 5	?L	—	—	(2.1)	3.7
Zi-ka-wei	15.7	—	—	—	—	e 7.5	—

Additional readings and notes: Tokyo readings have been increased by 1m.
 Nagoya gives also MN = +2.1m.

April 28d. Readings also at 0h. (near Tokyo and Mizusawa), 3h. (near Tokyo and near Belgrade), 5h. (Ottawa and Chicago), 6h. (Zi-ka-wei, Mizusawa, and Manila), 8h. (Riverview), 9h. (near Tokyo), 10h. (near Athens (2) and Belgrade), 13h. (Strasbourg and Manila), 14h. (Nagasaki), 19h. (near Tokyo, Osaka, and Nagoya), 23h. (Lick and near Tokyo).

April 29d. Readings at 2h. (near Tokyo), 4h. (La Paz and Lick), 8h. (Lick), 9h. (near Mizusawa), 10h. (Lick), 11h. (Melbourne and Riverview), 13h. (Lick), 14h. (Capetown), 16h. (near Tokyo and Nagoya), 17h. (near Mizusawa), 19h. (Lick), 23h. (Batavia).

April 30d. Readings at 7h. (La Paz), 9h. (Nagasaki), 11h. (near Tacubaya), 12h. and 13h. (La Paz), 14h. (De Bilt, Zagreb, Innsbruck, and Rocca di Papa), 15h. (Pompeii and Taihoku), 17h. (Taihoku), 18h. (near Tokyo), 19h. (Hamburg and near Mizusawa), 22h. (Hong Kong, Taihoku, Zi-ka-wei, and near Manila), 23h. (De Bilt, Uccle, Eskdalemuir, and Stonyhurst).

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May 1d. 10h. 51m. 10s. Epicentre 32°·5N. 143°·0E. (as on 1921 Sept. 3d.).

A = -·673, B = +·508, C = +·537 ; D = +·602, E = +·799 ;
G = -·429, H = +·323, K = -·843.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	4·1	320	i 0 50	-14	e 1 53	0	e 3·6	12·5
Nagoya	5·7	299	2 43	?S	(2 43)	+ 7	e 3·1	3·7
Osaka	6·6	291	—	—	3 20	+20	4·5	4·9
Mizusawa	E. 6·8	348	1 41	- 3	2 52	-13	—	—
Kobe	6·8	291	—	—	e 3 0	- 5	4·6	5·7
Nagasaki	11·0	275	4 47	?S	(4 47)	- 7	7·2	—
Zi-ka-wei	18·3	272	—	—	—	—	e 8·6	—
Manila	26·8	233	—	—	—	—	e 12·8	—
Christchurch	80·7	159	35 32	?	—	—	39·7	40·7
Hamburg	84·8	334	—	—	—	—	e 38·8	—
Eskdalemuir	87·5	342	—	—	—	—	48·8	—
De Bilt	87·7	335	—	—	—	—	e 46·8	55·5
Uccle	89·0	335	—	—	—	—	—	48·8
Strasbourg	89·6	331	—	—	—	—	50·8	—

Additional readings: Osaka gives also MN = +5·0m. Mizusawa SN = +2m.54s. Kobe MN = +4·7m. De Bilt MN = +55·3m.

May 1d. Readings also at 0h. (Pompeii), 3h. (La Paz), 5h. (near Malaga and Granada), 10h. (near Mizusawa), 11h. (Sydney, Riverview, and near Tacubaya), 12h. (Ottawa, Melbourne, Chicago, Colombo, Ann Arbor, and Washington), 13h. (Eskdalemuir, De Bilt, Uccle, and Strasbourg), 15h. (Riverview), 17h. (near Port au Prince), 20h. (near Tacubaya), 21h. (Manila), 22h. (near Mizusawa and near Tacubaya).

May 2d. 11h. 10m. 45s. Epicentre 20°·0N. 98°·0E.

A = -·131, B = +·931, C = +·342 ; D = +·990, E = +·139 ;
G = -·048, H = +·339, K = -·940.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	9·4	287	2 10	- 2	4 10	- 3	5·8	9·2
Hong Kong	15·3	78	3 45	+ 2	6 45	+ 6	7·8	8·9
Simla	E. 21·8	305	4 57	- 6	8 51	-10	—	—
	N. 21·8	305	5 15	+12	9 15	+14	12·8	15·0
Colombo	22·0	236	4 15	-50	8 15	-50	11·8	14·2
Kodaikanal	22·1	247	9 45	?S	(9 45)	+38	18·0	20·6
Taihoku	22·3	73	—	—	e 9 2	- 9	11·9	13·1
Manila	22·6	100	e 5 4	- 8	(8 55)	-22	8·9	9·3
Bombay	23·8	272	9 34	?S	(9 34)	- 6	(14·3)	17·0
Zi-ka-wei	23·8	57	e 5 15	-11	e 9 24	-16	—	13·0
Batavia	27·6	161	e 5 52	-12	i 11 26	+32	(e 14·8)	17·3
Nagasaki	31·1	58	11 24	?S	(11 24)	-29	18·2	17·6
Kobe	35·8	57	e 9 3	?PR ₁	—	—	19·8	22·3
Osaka	36·1	57	12 40	?S	(12 40)	-31	18·1	21·1
Tokyo	39·7	57	—	—	e 18 44	+ 7	e 20·8	21·1
Helwan	60·5	293	—	—	e 18 37	+ 7	—	41·5
Konigsberg	N. 66·6	323	—	—	1 19 51	+ 6	e 34·2	37·4
Belgrade	67·4	311	e 9 34	-86	e 20 4	+ 9	39·5	44·0
Vienna	69·8	318	—	—	e 26 15	?	—	41·2
Zagreb	70·2	313	e 11 15	- 3	e 20 15	-13	e 37·2	48·2
Hamburg	72·7	322	—	—	e 22 15	+77	37·6	45·2
Melbourne	72·7	143	—	—	—	—	—	50·8
Innsbruck N.W.	73·2	318	—	—	—	—	e 41·2	—
Rocca di Papa	73·5	310	—	—	—	—	e 34·4	—
Riverview	73·9	137	—	—	—	—	e 42·0	44·4
Strasbourg	75·4	319	e 22 15	?S	(22 15)	+45	e 35·8	43·1

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.
De Bilt	76.1	321	—	—	21 37	- 1	e 38.2	48.0
Moncalieri	76.2	314	e 19 9	?	26 36	?SR ₁	34.1	48.0
Besançon	76.8	318	—	—	—	—	43.2	—
Uccle	76.9	320	e 16 57	?PR ₁	e 21 46	- 2	e 38.2	43.3
Paris	78.6	319	—	—	—	—	43.2	49.2
Kew	79.5	322	30 15	?L	—	—	(30.2)	57.2
Eskdalemuir	79.5	326	—	—	e 22 15	- 3	38.2	44.9
Edinburgh	79.6	326	—	—	e 22 15	- 4	—	44.2
Stonyhurst	79.9	324	e 21 39	?S	(e 21 39)	-43	40.4	52.8
Oxford	80.0	322	—	—	22 23	0	31.8	52.4
Bidston	80.4	324	23 10	?S	(23 10)	+42	(34.3)	47.0
Tortosa	N. 82.5	311	—	—	—	—	e 43.2	48.7
Rio Tinto	E. 88.7	310	56 15	?L	—	—	(56.2)	59.2
Coimbra	N. 89.0	312	e 10 44	-146	e 23 44	-19	43.8	51.8
Victoria	E. 89.0	312	e 12 28	-42	—	—	e 41.8	52.8
Toronto	102.3	26	—	—	—	—	56.7	62.2
Chicago	116.3	357	—	—	—	—	55.6	—
La Paz	118.0	4	—	—	e 39 45	?SR ₁	64.2	—
	166.4	283	21 11	[+59]	—	—	—	—

Additional readings and notes : Taihoku gives also MN = +12.4m. Manila MN = +9.9m. Batavia L is given as S, S is given as i. Kobe MN = +19.7m. Osaka MN = +20.0m. Tokyo e = +16m.43s. Helwan e = +14m.8s. Konigsberg ME = +45.0m. Belgrade PR₁ = +15m.38s., SR₁ = +36m.35s., L = +53.6m. Zagreb MNW = +44.2m. Hamburg e = +30m.15s., MN = +41.2m. Melbourne SR₁ = +29m.57s., SR₂ = +33m.27s. Innsbruck eLNE = +48.6m., eLNW = +39.6m. Riverview MN = +44.0m. Strasbourg eS = +30m.23s., e = +34m.37s. De Bilt MN = +43.7m. Uccle eS = +26m.39s. Paris e = +24m.3s. and +31m.23s., MN = +44.2m. Victoria and Toronto readings are diminished by one hour. Toronto L = +61.0m.

May 2d. Readings also at 3h. (near Tacubaya), 4h. (Nagoya), 6h. (near Tacubaya), 7h. (Manila), 12h. (Mendoza and Cipolletti), 14h. (Rio Tinto), 20h. (Porto Rico), 21h. (Batavia).

May 3d. 4h. 0m. 20s. Epicentre 51°-2N. 172°-0W.

A = -0.621, B = -0.087, C = +0.779 ; D = -0.139, E = +0.990 ; G = -0.772, H = -0.108, K = -0.627.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Honolulu	31.8	155	—	—	—	—	13.7	14.5
Zi-ka-wei	z. 52.5	275	e 9 16	- 7	e 16 47	- 3	—	—
Chicago	55.6	65	17 20	?S	(17 20)	- 9	31.7	—
Ann Arbor	N. 57.4	61	(11 10)	+75	—	—	11.2	—
Ottawa	59.2	54	10 10	+ 4	18 19	+ 6	e 29.0	—
Eskdalemuir	73.1	7	—	—	e 21 10	+ 7	35.7	47.2
Bidston	75.1	7	—	—	—	—	—	57.9
De Bilt	E. 76.9	1	—	—	e 21 46	- 2	e 41.7	53.5
	N. 76.9	1	—	—	—	—	e 49.7	54.1
Uccle	78.1	2	e 21 58	?S	(21 58)	- 3	(e 32.1)	—
Strasbourg	80.3	0	—	—	—	—	e 50.7	—
Zagreb	82.8	355	—	—	—	—	41.7	—
Coimbra	87.6	12	e 11 40	-83	23 32	-16	e 60.2	—

Additional readings : Chicago gives also L = +33.7m. Ottawa L = +31.7m., T₀ = 4h.0m.23s. Coimbra eLN = +49.2m.

May 3d. Readings also at 5h. (Cipolletti, Mendoza, and near Port au Prince), 9h. (near Tokyo), 12h. (Nagasaki), 15h. (Zi-ka-wei), 16h. (Batavia, Colombo, Sydney, Riverview, Melbourne, Adelaide, and Zi-ka-wei), 22h. (near Mizusawa).

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1922. May 4d. 9h. 12m. 45s. Epicentre 46°0N. 154°0E.

A = -·624, B = +·305, C = +·719; D = +·438, E = +·899;
G = -·647, H = +·315, K = -·695.

The epicentre 45°·3N. 153°·5E. of April 26d. was tried but found unsuitable.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	7·8	271	2 3	+ 5	(3 34)	+ 3	3·6	4·3
Tokyo	14·9	231	e 3 38	0	e 6 25	- 5	e 10·6	12·6
Nagoya	16·8	236	4 0	- 2	—	—	—	—
Osaka	18·0	238	2 38	?	(7 0)	-40	7·0	9·8
Kobe	18·2	238	i 4 19	- 0	7 48	+ 4	9·9	18·8
Nagasaki	22·7	243	5 10	- 3	9 12	- 7	12·4	—
Zi-ka-wei	29·1	251	i 6 6	-13	e 10 58	-21	e 13·6	17·9
Taihoku	33·3	242	—	—	e 12 47	+18	—	—
Hong Kong	39·4	246	7 41	- 9	—	—	—	—
Manila	41·8	232	e 7 59	-10	—	—	—	—
Honolulu	46·0	104	8 35	- 5	15 23	- 5	—	25·5
Victoria	53·4	55	—	—	(15 45)	-76	15·8	30·1
Calcutta	57·3	270	9 48	- 6	—	—	—	—
Simla	N. 59·5	285	18 9	?S	(18 9)	- 8	e 34·6	—
Berkeley	N. 59·9	66	e 10 31	+20	e 18 33	+11	e 25·7	27·4
Lick	N. 60·7	66	—	—	—	—	e 26·7	—
Batavia	66·9	232	i 11 0	+ 3	i 19 50	+ 1	—	—
Upsala	68·3	339	11 7	+ 1	e 20 3	- 3	e 33·2	36·9
Bombay	70·4	277	20 30	?S	(20 30)	- 1	(e 36·9)	—
Konigsberg	E. 71·8	334	11 30	+ 2	20 13	-35	e 38·2	45·2
	N. 71·8	334	11 35	+ 7	20 48	0	—	—
Tiflis	72·1	313	e 13 39	?PR ₁	—	—	37·2	48·2
Kodakanal	73·3	269	21 21	?S	(21 21)	+15	—	—
Colombo	74·0	265	10 15	-37	22 15	+61	49·8	57·2
Lemberg	74·8	329	e 10 15	-93	e 21 3	-21	e 37·4	50·4
Hamburg	75·8	340	i 11 54	0	e 21 35	0	e 36·2	43·6
Edinburgh	76·3	348	45 15	?L	—	—	(45·2)	—
Chicago	76·5	43	11 56	- 2	i 21 42	- 1	e 36·2	—
Eskdalentuir	E. 76·9	348	i 12 1	+ 1	i 21 47	- 1	33·2	44·0
	N. 76·9	348	—	—	—	—	36·2	49·7
Ann Arbor	N. 77·9	40	12 9	+ 3	22 9	+10	37·0	—
Stonyhurst	78·1	347	e 27 45	?SR ₁	—	—	—	54·2
De Bilt	E. 78·3	341	12 11	+ 2	22 7	+ 3	e 35·2	45·6
	N. 78·3	341	—	—	—	—	e 38·2	55·6
Budapest	78·5	331	e 13 17	+67	e 22 5	- 1	e 41·6	—
Toronto	78·6	37	e 18 3	?PR ₁	21 45	-22	e 46·8	55·6
Bidston	78·7	347	13 10	+59	21 0	-68	—	58·0
Ottawa	78·7	33	12 10	- 1	22 4	- 4	e 32·2	—
Vienna	78·8	333	i 12 10	- 2	22 44	+34	e 44·2	52·8
Uccle	79·7	341	e 12 11	- 6	e 22 16	- 4	e 36·2	44·2
Riverview	79·9	183	e 12 23	+ 5	e 22 20	- 2	e 34·4	43·4
Oxford	80·0	346	—	—	22 17	- 6	—	—
Kew	80·1	346	22 15	?S	(22 15)	- 9	—	60·2
Belgrade	80·4	329	e 12 17	- 4	e 22 44	+16	e 42·8	55·1
Ithaca	80·8	36	—	—	—	—	45·2	—
Strasbourg	E. 81·0	339	e 12 27	+ 2	e 22 30	- 5	37·8	42·7
	N. 81·0	339	e 12 37	+12	e 22 32	- 3	—	53·2
Zagreb	81·0	331	e 12 25	0	e 22 33	- 2	38·2	51·4
Zurich	Z. 81·8	338	e 12 25	- 4	—	—	—	—
Paris	82·0	342	e 12 28	- 2	e 22 40	- 6	42·2	45·2
Adelaide	82·1	194	—	—	i 22 45	- 2	e 46·2	65·8
Besangon	82·7	339	e 12 32	- 2	—	—	42·2	—
Padova	82·7	335	11 57	-37	22 15	-39	44·2	54·8
Georgetown	E. 83·5	38	e 12 45	+ 6	23 0	- 3	49·2	—
	N. 83·5	38	e 12 40	+ 1	—	—	54·2	—
Washington	83·5	38	13 15	+36	23 15	+12	e 43·2	—
Melbourne	84·1	187	—	—	23 15	+ 6	42·6	61·2
Monicaleri	84·3	337	12 40	- 4	22 26	-45	41·1	63·6
Puy de Dôme	84·8	341	12 15	-32	—	—	—	—
Rocca di Papa	85·7	332	i 12 45	- 7	e 23 9	-18	47·8	57·8
Helwan	88·1	313	i 12 58	- 8	23 22	-31	55·2	57·9
Barcelona	89·0	339	—	—	23 51	-12	46·1	55·2

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tortosa	N. 90.0	341	—	—	—	—	e 44.2	61.6
Coimbra	92.4	347	e 13 15	-14	23 53	-46	e 42.8	60.0
Algiers	93.2	337	—	—	e 23 48	-59	e 49.2	57.2
Río Tinto	94.4	345	49 15	?L	—	—	(49.2)	55.2
Granada	94.5	342	e 13 39	- 2	e 24 53	- 8	e 35.2	—
San Fernando	95.6	344	17 33	?PR ₁	—	—	—	60.2
La Paz	134.3	63	e 19 36	[+ 7]	—	—	73.2	82.2

Additional readings and notes : Ootomari gives also MN = +4.0m. Osaka MN = +11.1m. Zi-ka-wei MZ = +18.8m., MN = +19.7m. All readings given as at 3h. Honolulu PR₁ = +10m.38s., SR₁N = 18m.45s., SR₁E = +19m.50s., SR₂N = +20m.20s., MN = +22.2m. Victoria readings have been diminished by 1h. Simla SN = +30m.45s. Batavia i = +13m.38s. Apia ($\Delta = 67^\circ 3'$) gives simply 10h. Upsala MN = +47.2m. Konigsberg iPZ = +11m.28s. (O-C=0s.). Hamburg MZ = +46.6m., MN = +50.2m. Eskdalemuir PR₁? = +14m.55s., SR₁? = +27m.0s., T = 9h.12m.58s. Stonyhurst P has been increased by 1h. De Bilt SR₁ = +27m.35s. Toronto eL = +51.6m. Ottawa L = 43.2m., T₀ = 9h.12m.59s. Belgrade PR₁ = +14m.3s., SR₁ = +26m.11s., SR₂ = +40m.2s. Uccle SR₁ = +27m.57s., MN = +55.7m. Riverview MN = +41.8m., T₀ = 9h.12m.56s. Strasbourg PV = +12m.20s. (O-C = -5s.). Zagreb MNW = +46.2m. Paris MN = +56.2m. Adelaide e = +30m.15s. Padova PR₁ = +13m.30s. Melbourne SR₁ = +34m.45s.(?). Moncalieri MN = +60.0m. Barcelona e = +22m.41s. Coimbra MN = +57.7m., T₀ = 9h.13m.19s. Granada i = +16m.3s. and +26m.21s. San Fernando MN = +64.0m. La Paz PR₁ = +23m.14s.

May 4d. 21h. 26m. 15s. Epicentre 36°1N. 137°3E. (as on 1921 Sept. 17d.).

A = -594, B = +548, C = +589.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Nagoya	1.0	196	0 10	- 5	—	—	—	—
Tokyo	2.0	100	0 34	+ 3	0 59	+ 4	1.4	—
Osaka	2.1	218	0 30	- 3	—	—	—	3.7
Kobe	2.2	231	i 0 20	-14	—	—	1.3	3.1
Zi-ka-wei	14.1	254	e 2 36	-51	—	—	—	—
La Paz	150.1	56	18 48	[-68]	—	—	—	—

No additional readings. Kobe gives the above as on May 6d.

May 4d. Readings also at 0h. and 2h. (Batavia), 8h. (Granada), 9h. (Vienna), 10h. (Mendoza and Pilar), 11h. (Port au Prince), 12h. (La Paz), 13h. (Florence), 20h. (near Port au Prince).

May 5d. 0h. 18m. 30s. Epicentre 44°0N. 152°0E.

A = -635, B = +338, C = +695; D = +469, E = +883;

G = -613, H = +326, K = -719.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	7.0	295	1 53	+ 7	(3 11)	+ 1	3.2	4.5
Mizusawa	9.5	243	2 28	+ 5	4 12	- 4	—	—
Tokyo	12.5	232	e 5 19	?S	(e 5 19)	-13	e 7.1	—
Osaka	15.8	239	4 8	+19	—	—	—	9.9
Kobe	16.0	240	3 55	+ 3	8 15	?L	12.1	15.0
Zi-ka-wei	27.2	252	e 5 49	-11	e 10 39	- 6	—	17.6
Taihoku	31.1	241	—	—	—	—	e 18.6	—
Manila	39.5	230	e 8 30	+39	—	—	—	—
Tiflis	72.3	312	—	—	—	—	e 41.5	—
Hamburg	77.2	338	e 11 54	- 8	—	—	e 40.5	—
Chicago	79.0	41	—	—	e 34 45	? e	42.8	—

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.
Stonyhurst	79.7	346						69.5
De Bilt	79.8	340				e 42.5		44.2
	79.8	340				e 44.5		54.1
Vienna	79.9	332	i 12 8	-10	(22 0)	-22		51.0
Ann Arbor	80.3	38					46.9	
Ottawa	81.1	31					e 40.0	
Uccle	81.1	340	e 14 49	?			e 37.5	
Belgrade	81.3	327	e 39 50	?L	e 50 20	?	75.8	
Kew	81.6	345						61.5
Zagreb	82.1	330	e 12 30	-1			31.5	52.5
Strasbourg	82.3	338					e 39.5	49.5
Paris	83.4	340					e 47.5	
Moncalieri	85.5	336			e 24 18	+53	48.9	
Rocca di Papa	86.8	330	e 13 6	+8			e 41.8	53.3
Coimbra	94.0	346			e 43 50	?L	e 53.8	
Algiers	94.5	335					e 36.5	38.0
La Paz	136.4	64					96.4	97.6

Additional readings: Mizusawa gives also SN = +4m.10s. Tokyo eS = +6m.18s. Kobe MN = +12.3m. Stonyhurst P = 0h.13m.30s.
 Vienna iPR₁ = +14m.45s., S is recorded as PSE. Ann Arbor LN = +48.0m. Ottawa L = +47.5m. Zagreb e = +14m.54s., MNW = +47.5m. Algiers readings diminished by 1h.

May 5d. Readings also at 0h. (Zi-ka-wei, near Mizusawa, and near La Paz), 1h. (Kobe, near Mizusawa, Moncalieri, Manila, La Paz, Uccle, and De Bilt), 2h. (Zi-ka-wei), 6h. (La Paz), 8h. (Taihoku, Tacubaya, and Vera Cruz), 14h. (Batavia, Zi-ka-wei, Riverview, and Manila), 15h. (La Paz), 18h. (Strasbourg), 20h. (Taihoku), 21h. (2) and 22h. (Manila).

May 6d. 12h. 20m. 0s. Epicentre 47°3N. 151°5E. (as on 1921 Sept. 5d.).

A = -596, B = +324, C = +735; D = +477, E = +879;
 G = -646, H = +351, K = -678.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Ootomari	6.0	267	1 40	+8			3.2	4.2
Mizusawa	11.1	226	2 36	-10	4 29	-28		
	11.1	226	2 42	-4	4 31	-26		
Tokyo	14.5	221	6 31	?S	(6 31)	+11	e 8.0	
Kobe	17.6	230	e 3 58	-14			e 10.9	
Zi-ka-wei	28.0	246	e 5 58	-10	e 10 56	-3		16.0
Manila	41.4	229	e 8 26	+20				
Konigsberg	69.8	332	i 11 13	-3			e 41.1	46.4
Tiflis	69.9	310					e 42.0	
Colombo	72.5	263	46 0	?L			(46.0)	58.0
Hamburg	74.0	338					e 38.0	46.8
Eskdalemuir	75.2	347			e 21 0	-28	40.0	
De Bilt	76.5	340			21 46	+3	e 36.0	45.2
	76.5	340					e 41.0	52.5
Bidston	77.0	345						56.0
Uccle	77.9	340	e 12 6	0	e 22 0	+1	e 35.0	
Oxford	78.3	345						55.0
Kew	78.3	345						63.0
Zagreb	79.0	330	e 12 6	-7	e 22 0	-12	e 40.0	53.9
Strasbourg	79.1	337					e 42.0	
Paris	80.2	341	e 22 25	?S	(e 22 25)	0	47.0	57.0
Rocca di Papa	83.8	330	e 34 24	?				36.8
Algiers	91.3	335	20 0	?PR ₁				

Additional readings and notes: Ootomari gives its readings as at 13h. Tokyo S = +7m.9s. Zagreb MNW = +45.4m. Rocca di Papa E = +35m.0s., N = +35m.6s.

May 6d. Readings also at 2h. (Zi-ka-wei, Kodaikanal, and near Mizusawa), 3h. (De Bilt, Batavia, Uccle, Strasbourg), 4h. (Simla (3) and Zagreb), 6h. (near Belgrade), 10h. (near Tokyo and Mizusawa), 16h. (Zi-ka-wei, Manila, and near Hong Kong), 20h. (Riverview and near Tokyo), 21h. (Manila and Riverview), 23h. (Zagreb, De Bilt, and near Athens).

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May 7d. Readings at 3h. (Manila), 4h. (near Vera Cruz, Oaxaca, Tacubaya, and near Athens), 6h. (near La Paz), 9h. (Manila), 10h. (Zi-ka-wei), 13h. (La Paz), 14h. (near Tokyo), 16h. (Batavia), 19h. (Zi-ka-wei and near Mizusawa and Tokyo), 22h. (Nagoya).

May 8d. Readings at 2h. (Batavia), 12h. (Zagreb, Rocca di Papa, and Pompeii), 15h. (Batavia), 16h. (Zi-ka-wei and near Tokyo), 20h. (Zi-ka-wei), 21h. (Colombo).

May 9d. 3h. 28m. 48s. Epicentre 36°·5N. 139°·5E.

$$A = -.611, B = +.522, C = +.595.$$

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	0·9	i 0 15	+ 1	i 0 23	- 2	—	0·4
Nagoya	2·5	0 42	+ 3	—	—	1·4	2·0
Mizusawa	2·9	0 51	+ 6	1 27	+ 7	—	—
Osaka	3·8	1 11	+12	—	—	2·1	2·7
Kobe	4·0	i 0 59	- 3	1 38	-12	2·2	2·4
Zi-ka-wei	Z. 15·9	3 42	- 9	e 6 46	- 7	—	10·6
De Bilt	E. 82·8	—	—	—	—	e 47·2	—
La Paz	148·4	19 52	[- 1]	—	—	—	—

Additional readings: Nagoya gives also MN = +1·4m. Osaka MN = +2·8m.
De Bilt eLN = +45·2m.

May 9d. 7h. 25m. 10s. Epicentre 34°·5N. 1°·5W.

$$A = +.324, B = -.022, C = +.566; \quad D = -.026, E = -1.000;$$

$$G = +.566, H = -.015, K = -.824.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Almeria	2·5	342	0 57	+18	—	—	—	—
Granada	3·2	328	0 49	- 1	i 1 27	- 1	i 1·6	2·3
Malaga	3·3	315	0 24	-28	—	—	—	—
San Fernando	4·3	299	1 39	+32	—	—	—	2·5
Algiers	4·4	57	e 2 30	?L	3 14	?	(2·5)	4·3
Tortosa	N. 6·5	14	e 1 43	+ 4	—	—	—	—
Barcelona	7·5	22	e 1 54	0	—	—	—	5·8
Uccle	16·9	13	—	—	—	—	e 8·8	—
De Bilt	E. 18·2	13	—	—	—	—	e 9·8	—

Additional readings: Granada i = +1m.4s., MN = +2·2m. De Bilt eN = +10m.50s.

May 9d. 13h. 50m. 15s. Epicentre 8°·1S. 119°·6E.

$$A = -.489, B = +.861, C = -.141; \quad D = +.869, E = +.494;$$

$$G = +.070, H = -.123, K = -.990.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Batavia	12·8	278	3 9	- 1	e 5 18	-21	—	7·6
Manila	22·7	3	5 26	+13	(8 52)	-27	8·9	10·8
Perth	24·1	188	—	—	(10 10)	+24	10·2	—
Hong Kong	30·9	352	7 45	+68	—	—	—	—
Taihoku	33·2	4	e 6 59	+ 1	—	—	—	—
Melbourne	37·5	146	7 33	- 1	13 33	+ 2	19·5	21·5
Riverview	38·9	138	e 7 35	-10	e 13 32	-19	e 19·5	23·8
Sydney	38·9	138	15 9	?S	(15 9)	+78	—	22·7
Zi-ka-wei	39·3	4	7 48	- 1	e 13 56	0	—	22·9
Calcutta	43·3	317	8 32	+12	—	—	—	—
Kodaikanal	45·8	293	15 39	?S	(15 39)	+14	—	—
Simla	E. 56·5	317	11 51	?PR ₁	18 15	+35	19·3	—
Tiflis	84·3	315	e 13 45	+61	(22 45)	-26	—	22·8
Helwan	92·5	300	13 22	- 8	23 45	-55	—	24·3

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.
Capetown	94.6	235	24 1	?S	(24 1)	-61	—	—
Belgrade	98.5	315	e 24 34	?	(e 25 46)	+ 5	—	29.2
Zagreb	105.2	316	e 18 45	?PR ₁	i 24 51	-113	45.8	—
Rocca di Papa	108.0	311	e 16 21	+93	i 25 3	-127	—	25.1
Strasbourg	110.5	319	e 19 18	?PR ₁	e 29 37	+124	e 35.8	—
De Bilt	111.3	323	e 20 3	?PR ₁	i 26 19	-141	e 54.8	67.4
Uccle	112.1	322	e 19 33	?PR ₁	e 28 44	+57	e 52.8	69.8
Paris	113.7	320	—	—	e 25 29	-151	—	—
Victoria	113.9	40	—	—	—	—	55.8	61.8
Kew	114.7	324	—	—	—	—	—	30.8
Eskdalemuir	114.9	328	e 19 58	?PR ₁	29 45	+96	51.8	—
Oxford	115.1	324	—	—	i 25 34	-157	—	30.3
Bidston	115.6	307	—	—	—	—	—	64.2
Algiers	116.0	326	e 19 43	?PR ₁	e 29 45	+87	e 47.8	52.2
Tortosa	117.1	312	—	—	—	—	e 54.8	—
Toronto	140.8	22	(17 39)	?	—	—	—	17.4
La Paz	154.2	163	20 12	[+11]	30 53	?	—	49.6

Additional readings and notes : Batavia suggests $T_0 = 13h.50m.28s.$ Epicentre $6^\circ.5S. 118^\circ.7E.$, which was first tried. Manila MN = +11.4m. Perth gives also $SR_1 = +3m.7s.$ Riverview PS? = +14m.6s., eSR₁? = +16m.14s., MN = +24.1m., MZ = +27.2m. Sydney P has been increased by 30m. Rocca di Papa iPN = +19m.19s. (?PR₁N). De Bilt MN = +59.4m. Uccle e = +25m.21s. Eskdalemuir iE = +25m.31s. and +26m.44s. Algiers iPR₁ = +25m.33s.

May 9d. Readings also at 3h. (near Athens), 6h. (near Tacubaya and near Vera Cruz), 7h. (near Vera Cruz), 9h. (Manila), 10h. (Zi-ka-wei), 13h. (La Paz, Melbourne, Adelaide, Manila, Riverview, and Zi-ka-wei), 14h. (Victoria and Adelaide), 19h. (Zi-ka-wei, Manila, and near Athens).

May 10d. 9h. 20m. 6s. Epicentre $6^\circ.0S. 113^\circ.0E.$

A = -389, B = +915, C = -105; D = +921, E = +391; G = +041, H = -096, K = -995.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	6.2	267	i 1 50	+15	i 2 36	-13	—	4.7
Manila	22.1	21	e 5 14	+ 8	(9 20)	+13	9.3	10.9
Hong Kong	28.4	2	—	—	10 57	-9	—	13.1
Zi-ka-wei	38.1	13	7 31	- 8	e 13 25	-14	—	17.0
Melbourne	43.0	143	e 10 18	?PR ₁	—	—	—	29.9
Riverview	44.9	136	e 10 2	+90	e 17 33	+139	26.0	30.7
Zagreb	99.2	316	—	—	e 24 9	-99	—	—
De Bilt	E. 105.7	323	—	—	e 24 40	-129	e 56.9	—
Berkeley	E. 120.7	49	—	—	—	—	e 48.9	—
La Paz	157.4	177	e 19 52	(-13)	—	—	—	—

Additional readings : Manila MN = +11.4m. Zi-ka-wei SR₁Z = +14m.31s. Riverview MN = +27.1m., $T_0 = 9h.20m.41s.$ De Bilt eLN = +54.9m.

May 10d. 16h. 31m. 54s. Epicentre $29^\circ.0N. 139^\circ.0E.$ (as on 1921 Mar. 4d.).

A = -660, B = +574, C = +485; D = +656, E = +755; G = -366, H = +318, K = -875.

The residuals would be somewhat improved by diminishing T_0 by 16 sec., and putting the epicentre $1^\circ.2$ further East (at $29^\circ.0N. 140^\circ.2E.$), but there are advantages in retaining the former epicentre for comparison.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Osaka	6.4	333	1 53	+15	—	—	3.7	4.6
Kobe	6.5	332	—	—	—	—	—	3.8
Tokyo	6.7	5	i 1 24	-18	i 1 33	-89	—	1.6
Mizusawa	E. 10.3	9	2 31	- 3	4 45	+ 8	—	—
Zi-ka-wei	15.3	283	e 3 18	-25	—	—	—	—
Manila	22.0	233	e 5 6	+ 1	—	—	—	—

Mizusawa gives also PN = +2m.30s.

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May 10d. Readings also at 2h. (Colombo), 11h. (Alicante and near Tokyo), 16h. (near Tokyo), 18h. (Taihoku), 23h. (Georgetown).

May 11d. 0h. 44m. 32s. Epicentre 48°-8S. 79°-0W.

A = +.126, B = -.647, C = -.752; D = -.982, E = -.191;
G = -.144, H = +.739, K = -.659.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Cipolletti		12.5	42	3 34	+28	—	—	4.4	7.4
Mendoza		17.8	31	6 58	?S	(6 58)	-38	8.7	11.5
Pilar	E.	20.5	39	4 58	+11	(8 28)	-6	8.5	11.2
	N.	20.5	39	4 52	+5	(8 28)	-6	8.5	12.0
Chacarita	E.	20.8	55	4 52	+1	—	—	10.4	12.5
	N.	20.8	55	5 34	+43	—	—	11.4	13.1
La Paz		33.5	19	i 6 55	-6	i 12 24	-8	18.3	21.5
Riverview		86.1	220	—	—	e 37 22	? e	43.1	50.4
Georgetown		87.7	2	—	—	e 23 50	+1	—	—
Chicago		90.8	354	16 3	?	23 28	-54	43.5	—
Toronto		92.4	0	—	—	—	e	34.4	—
Ottawa		94.2	3	—	—	i 24 17	-41	41.5	—
Rio Tinto		107.6	52	77 28	?L	—	—	(77.5)	80.5
Coimbra		108.5	48	e 19 58	?PR ₁	28 38	+83	e 47.5	—
Tortosa	N.	113.6	53	—	—	—	—	e 60.5	74.0
Oxford		120.2	44	—	—	—	—	55.5	—
Kew		120.5	44	—	—	—	—	—	74.5
Bidston		120.6	42	—	—	—	—	—	67.5
Stonyhurst		121.1	42	27 58	?S	(27 58)	-60	—	73.0
Eskdalemuir		121.8	40	—	—	30 28	+85	53.5	—
Edinburgh		122.1	40	63 28	?L	—	+94	e (63.5)	—
Uccle		122.3	47	—	—	e 30 40	+94	e 56.5	68.5
Strasbourg		122.6	51	—	—	e 30 28	+79	—	72.5
De Bilt		123.5	47	—	—	e 30 52	+96	e 58.5	73.1
Zi-ka-wei		156.6	229	e 20 30	[+26]	—	—	—	—

Additional readings: Riverview gives also MN = +52.3m. Georgetown
eN = 1h.9m. De Bilt MN = +74.1m.

May 11d. 6h. 45m. 25s. Epicentre 11°-8N. 60°-5W.

A = +.482, B = -.852, C = +.204; D = -.870, E = -.492;
G = +.101, H = -.178, K = -.979.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Porto Rico	E.	8.0	324	2 13	+12	4 9	+32	5.5	12.5
	N.	8.0	324	—	—	3 49	+12	4.8	—
Port au Prince		13.3	302	i 3 45	+28	—	—	6.3	6.8
La Paz		29.3	195	i 6 7	-14	i 10 53	-29	14.0	17.2
Georgetown	E.	30.9	335	e 6 35	-2	11 50	0	e 18.9	—
Washington		30.9	335	7 15	+38	12 26	+36	15.6	—
Ithaca	N.	33.7	340	e 6 59	-3	e 12 41	+5	e 18.2	—
Ottawa		36.0	343	7 18	-4	13 5	-5	19.6	—
Ann Arbor	N.	36.6	331	6 47	-40	13 11	-7	25.4	—
Chicago		38.2	326	7 30	-10	13 40	-1	18.8	—
Rio de Janeiro		38.6	155	—	—	e 16 3	?SR ₁	17.9	—
Pilar	E.	43.6	184	14 5	?S	(14 5)	-51	17.3	25.4
Mendoza		45.3	189	14 35	?S	(14 35)	-44	18.7	30.2
Chacarita	E.	46.4	178	15 5	?S	(15 5)	-28	18.6	24.7
Cipolletti		51.2	188	16 17	?S	(16 17)	-17	20.4	29.2
Coimbra	E.	53.8	49	9 32	0	17 1	-5	23.8	25.6
	N.	53.8	49	—	—	—	—	20.6	23.8
Tortosa	N.	60.5	50	10 20	+4	18 27	-3	25.0	25.3
Bidston		61.4	36	—	—	19 35	+54	—	29.6
Algiers		61.9	55	e 10 25	+1	e 18 47	0	25.6	34.6
Oxford		62.0	38	i 10 29	+4	i 18 47	-1	—	—
Stonyhurst		62.0	36	9 17	-68	—	—	34.6	—
Eskdalemuir	E.	62.0	34	10 30	+5	18 48	0	28.6	34.8
	N.	62.0	34	—	—	18 52	+4	—	34.7
Edinburgh		62.3	34	e 8 23	-124	18 55	+3	30.6	35.2
Kew		62.4	38	—	—	—	—	—	28.6

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria	63.3	319	—	—	(18 41)	-24	18.7	—
Paris	63.5	41	—	—	i 19 9	+2	26.6	32.6
Uccle	65.1	39	e 10 47	+1	e 19 27	+1	e 28.6	—
De Bilt	E. 65.9	39	11 1	+11	19 38	+2	e 30.6	37.6
	N. 65.9	39	—	—	—	—	e 28.6	36.5
Strasbourg	66.9	42	e 11 5	+8	e 20 20	+31	—	—
Hamburg	69.0	38	e 11 13	+2	e 20 16	+2	e 31.6	38.6
Rocca di Papa	69.7	50	11 13	-2	—	—	—	12.1
Pompeii	71.1	51	e 11 29	-9	—	—	—	—
Zagreb	72.2	46	e 11 29	-2	20 53	+1	e 32.6	40.6
Vienna	72.6	43	11 34	0	e 20 54	-3	e 36.6	48.6
Belgrade	75.4	46	e 10 52	-59	e 16 5	?PR ₁	—	—
Zi-ka-wei	Z. 137.0	358	e 22 38	?PR ₁	—	—	—	—

Additional readings: Port au Prince gives also MNW = +6.4m. La Paz
 iSN = +10m.56s., T₁ = 6h.45m.28s., Georgetown SN? = +11m.45s.
 Ottawa PR₂? = +8m.39s., SR₂ = +15m.46s., T₂ = 6h.45m.15s. Paris
 iSE = +19m.4s. Hamburg SR₁ = +28m.35s., MN = +37.6m. Rocca
 di Papa ePN = +11m.11s. Zagreb MNW = +41.6m. Belgrade e =
 +10m.55s., +12m.48s., and +15m.25s.

May 11d. 9h. 14m. 55s. Epicentre 22°0S. 170°0E. (as on 1919 Sept. 1d.).

A = -913, B = +161, C = -375; D = +174, E = +985;
 G = +369, H = -065, K = -927.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	19.2	68	4 21	-10	6 23	-103	7.8	16.1
Riverview	20.4	230	14 46	0	e 8 30	+2	e 9.4	11.3
Sydney	20.4	230	4 41	-5	(8 35)	+3	8.6	11.8
Christchurch	21.6	175	9 5	?S	(9 5)	+8	10.6	17.6
Melbourne	26.7	228	5 59?	+4	10 35	0	13.3	18.9
Adelaide	30.3	238	—	—	i 11 17	-22	—	20.0
Perth	48.8	245	—	—	26 45	?L	31.5	31.9
Honolulu	E. 53.5	38	—	—	17 22	+19	22.1	37.3
	N. 53.5	38	—	—	15 41	-82	22.7	35.8
Manila	60.4	303	e 10 32	+17	—	—	—	—
Batavia	62.8	274	10 35	+4	—	—	30.6	34.8
Zi-ka-wei	70.7	319	11 32	+11	e 20 24	-10	—	37.4
Victoria	92.1	38	—	—	—	—	—	46.7
Kodaikanal	96.2	279	35 5	?	—	—	48.1	51.2
Cipolletti	98.3	138	59 11	?L	—	—	(59.2)	62.3
Mendoza	101.8	133	32 23	?SR ₁	—	—	52.0	59.8
Pilar	105.6	134	31 35	?SR ₁	—	—	—	75.6
Chicago	113.5	51	—	—	e 26 5	-113	50.1	—
Toronto	119.7	51	—	—	—	—	66.1	74.0
Ottawa	122.3	49	—	—	e 33 53	?	60.1	—
Hamburg	145.0	340	e 19 43	[- 5]	—	—	e 64.1	89.1
Edinburgh	145.7	353	—	—	—	—	—	125.1
Belgrade	146.2	320	e 19 51	[+ 1]	i 32 47	?	41.0	—
Eskdalemuir	146.4	353	e 19 55	[+ 5]	e 31 34	?	65.1	—
Vienna	146.4	329	i 19 49	[+ 1]	—	—	e 68.1	79.1
De Bilt	E. 147.7	343	—	—	—	—	e 64.1	83.5
	N. 147.7	343	19 58	[+ 6]	—	—	e 75.1	80.7
Bidston	148.2	350	—	—	—	—	—	103.1
Zagreb	148.2	326	e 19 54	[+ 1]	—	—	e 63.1	78.1
Uccle	149.1	343	e 19 55	[+ 1]	e 33 17	?	61.1	—
Oxford	149.5	349	25 2	?PR ₁	—	—	75.1	108.6
Kew	149.6	350	—	—	—	—	—	124.1
Strasbourg	149.9	333	e 20 0	[+ 4]	—	—	e 66.1	—
Paris	151.5	343	—	—	—	—	e 81.1	91.1
Pompeii	152.1	318	e 20 5	[+ 6]	—	—	—	—
Rocca di Papa	152.6	321	20 11	[+11]	—	—	—	20.6
Algiers	161.4	326	—	—	—	—	e 53.1	110.1
Coimbra	161.8	356	e 23 15	?	25 15	?PR ₁	e 58.1	—

Additional readings: Apia gives MN = +8.1m. Riverview i = +4m.50s.,
 ePR₁ = +5m.25s., MN = +12.1m., MZ = +18.6m., T₁ = 9h.15m.0s. Christ-
 church gives a reading at +5m.59s.? Melbourne PR₁ = +6m.41s., SR₁ =
 +12m.5s. Perth PR₁ = +24m.35s., SR₁ = +29m.20s. Batavia i =
 +19m.6s., +19m.57s., and +20m.49s., MN = +35.8m. Toronto eL =
 +72.0m. Ottawa eI = +36m.23s., eL = +52.1m. Hamburg MN =
 +85.1m.

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May 11d. Readings also at 12h. (near Mizusawa), 14h. and 15h. (La Paz).

1922. May 12d. 18h. 39m. 20s. Epicentre 22°0S. 170°0E.
(as on 11d.).

A = -·913, B = +·161, C = -·375; D = +·174, E = +·985;
G = +·369, H = -·065, K = -·927.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Apia	19.2	68	4 35	+ 4	8 4	- 2	—	17.7
Riverview	20.4	230	i 4 50	+ 4	i 8 42	+10	e 9.9	10.9
Sydney	20.4	230	4 46	0	8 40	+ 8	10.3	12.7
Christchurch	21.6	175	—	—	10 4	+67	11.2	14.0
Melbourne	26.7	228	6 4	+ 9	10 46	+11	13.4	16.7
Adelaide	30.3	238	6 40?	+ 9	i 11 25	-14	e 14.4	19.4
Perth	48.8	245	—	—	15 23	-41	27.2	30.8
Honolulu	N. 53.5	338	i 9 34	+ 4	i 17 17	+14	e 25.3	23.0
Manila	60.4	303	e 10 5	-10	—	—	—	—
Batavia	62.8	274	i 10 32	+ 1	i 19 6	+ 8	23.8	36.3
Nagasaki	66.9	324	19 48	?S	(19 48)	- 1	—	—
Hong Kong	70.2	307	11 19	+ 1	e 20 36	+ 2	—	—
Zi-ka-wei	70.7	319	i 11 26	+ 5	e 20 36	- 4	e 40.9	37.6
Berkeley	87.3	46	i 12 55	- 6	e 23 40	+ 4	e 44.2	—
Lick	N. 87.5	47	—	—	—	-64	29.8	48.8
Victoria	92.1	38	—	—	23 32	-64	56.7	59.2
Colombo	92.8	276	—	—	47 40	?L	43.7	50.9
Tucson	E. 93.0	55	—	—	—	-68	54.3	64.1
Kodalkanal	96.2	279	24 10	?S	(24 10)	—	58.7	64.7
Cipolletti	98.3	138	30 34	?SR ₁	—	—	52.9	63.4
Mendoza	101.8	133	18 10	?PR ₁	—	—	—	—
Bombay	E. 103.4	284	e 11 46	—	—	—	—	—
Pilar	E. 105.6	134	19 10	?PR ₁	—	—	56.2	58.9
St. Louis	E. 110.9	55	—	—	—	—	e 56.0	60.2
La Paz	111.3	119	e 19 1	?PR ₁	e 35 46	?SR ₁	57.5	58.9
Chicago	113.5	51	e 19 40	?PR ₁	30 10	+132	54.7	—
Ann Arbor	116.4	51	—	—	—	—	39.1	65.7
Toronto	119.7	50	—	—	i 26 34	-133	e 62.6	70.6
Georgetown	E. 121.1	56	—	—	32 50	?L	e 61.2	—
Washington	121.1	56	—	—	e 37 40	?L	e 61.7	—
Ithaca	121.7	51	—	—	—	—	62.7	—
Ottawa	122.3	49	e 20 40	?PR ₁	e 27 40	-86	61.2	—
Fordham	E. 123.7	53	45 51	?L	51 15	?L	61.7	—
Northfield	124.5	49	—	—	—	—	e 65.7	—
Helwan	142.2	290	19 40	[- 3]	23 23	?PR ₁	74.7	83.6
Dyce	N. 144.3	352	i 19 41	[- 6]	e 35 6	—	65.7	73.7
Hamburg	145.0	340	i 19 47	[- 1]	—	—	e 62.7	82.7
Budapest	145.5	325	i 19 52	[+ 3]	—	—	—	—
Edinburgh	145.7	353	19 40	[- 9]	—	—	—	—
Belgrade	146.2	320	e 19 55	[+ 5]	e 32 13	?L	—	—
Eskdalemuir	N. 146.4	353	19 49	[- 1]	i 33 24	?L	60.7	99.1
Vienna	146.4	329	19 51	[+ 1]	—	—	e 71.7	84.0
Stonyhurst	147.6	350	e 20 10	[+18]	—	—	—	110.7
De Bilt	147.7	343	19 56	[+ 4]	—	—	e 62.7	84.4
Bidston	148.2	350	17 47	[-126]	20 57	?L	81.0	87.5
Zagreb	148.2	326	19 56	[+ 3]	—	—	e 50.7	83.7
Uccle	149.1	343	e 19 51	[- 3]	—	—	e 43.0	85.7
Innsbruck	N.W. 149.4	331	e 20 8	[+13]	e 40 34	?L	85.1	—
Oxford	149.5	349	20 1	[+ 6]	—	—	66.1	85.0
Kew	149.6	350	—	—	—	—	—	123.7
Strasbourg	149.9	333	e 19 57	[+ 1]	31 57	?L	e 50.7	103.3
Padova	150.6	328	20 20	[+23]	—	—	—	—
Paris	151.5	343	e 20 5	[+ 7]	—	—	74.7	85.7
Besançon	151.7	337	e 20 20	[+22]	—	—	78.7	—
Florence	152.0	326	—	—	—	—	—	54.7
Rocca di Papa	152.6	321	e 19 58	[- 2]	—	—	—	—
Moncalieri	152.8	332	20 8	[+ 8]	33 40	?L	45.7	—
Barcelona	158.0	335	—	—	e 82 54	?L	85.1	109.7
Tortosa	N. 159.3	337	e 19 40	[-27]	—	—	84.7	108.8
Algiers	161.4	326	e 20 8	[- 1]	e 31 6	?L	e 52.7	97.7
Coimbra	E. 161.8	356	—	—	32 43	?L	e 67.7	97.8
Granada	N. 161.8	356	e 20 51	[+42]	31 57	?L	—	106.8
Rio Tinto	163.9	341	20 17	[+ 6]	33 4	?L	e 80.7	86.2
San Fernando	164.0	350	30 40	?L	—	—	—	112.7
San Fernando	165.2	348	79 52	?L	—	—	(79.9)	109.9

For Notes see next page.

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NOTES TO MAY 12d. 18h. 39m. 20s.

Additional readings : Riverview $iPR_1 = +5m.1s.$, $iPR_2 = +5m.28s.$, $i = +8m.59s.$, $MN = +12.9m.$, $T_0 = 18h.39m.17s.$ Apia gives also $MN = +9.7m.$ Christchurch readings increased by 1h. Perth $PR_1 = +9m.5s.$, $SR_1 = +19m.20s.$, $SR_2 = +21m.55s.$ Honolulu $eN = +23m.24s.$ Batavia $iE = +15m.45s.$, $i = +21m.39s.$ Zi-ka-wei $PSZ = +21m.38s.$ SRZ = +25m.18s. Lick $iN = +49m.35s.$ Victoria $L = +136.6m.$ La Paz $iP = +19m.35s.$ Ann Arbor $LN = +39.0m.$ Toronto $e = +30m.16s.$, $i = +42m.34s.$, $eL = +66.7m.$, $iL = +81.8m.$ Georgetown $LN = +64.0m.$, $LE = +65.7m.$ Ottawa $i = +24m.29s.$, $eE = +32m.51s.$ Northfield $L = +70.7m.$ Belgrade $PR_1 = +20m.25s.$, $PR_2 = +21m.8s.$, $PR_3 = +21m.48s.$, $e = +42m.20s.$, $+43m.29s.$, and $+44m.25s.$ Eskdalemuir $iN = +23m.11s.$, $i = +42m.21s.$, $MN = +90.0m.$ Vienna $iP = +19m.52s.$, $MN = +97.4m.$ Zagreb $MNW = +87.7m.$ Uccle $PR_1 = 23m.28s.$ Innsbruck $eLNE = +88.1m.$ Strasbourg $ePE = +20m.1s.$ (O-C = [+5s.]), $MN = +100.7m.$ Rocca di Papa $iP = +20m.6s.$ (O-C = [+6s.]). Barcelona $MN = +96.9m.$ Granada $i = +21m.15s.$, $+21m.51s.$, and $+24m.46s.$ San Fernando $MN = +108.7m.$

May 12d. Readings also at 0h., 1h., and 3h. (Riverview), 4h. (near Taihoku), 5h. (De Bilt), 8h. (Tacubaya, Riverview, and Manila), 13h. (Manila), 14h. (Apia), 19h. (Vienna), 20h. (Manila), 23h. (Riverview).

May 13d. Readings at 3h. (Vienna, Melbourne, Riverview, and Christchurch), 4h. (Taihoku), 10h. (Melbourne), 11h. (Apia), 13h. (La Paz and Manila), 16h. (near Belgrade), 21h. (La Paz).

May 14d. Readings at 1h. (Vienna and near Padova), 2h. (near Belgrade), 8h. (Christchurch), 9h. (La Paz), 13h. (Batavia), 15h. (Batavia, Tacubaya, and La Paz), 16h. (Honolulu), 18h. (near Tokyo and Mizusawa), 23h. (Ann Arbor, Ottawa, Tacubaya, Chicago, and Berkeley).

May 15d. 20h. 21m. 16s. Epicentre $41^{\circ}0N. 144^{\circ}0E.$ (as on 1919 June 23d.).

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m.	m.
Mizusawa E.	2.9	230	0 52	+ 7	1 25	+ 5	—	—
N.	2.9	230	0 51	+ 6	1 23	+ 3	—	—
Sapporo	2.9	320	2 10	?	—	—	2.3	—
Ootomari	5.7	351	1 34	+ 6	(2 31)	- 5	2.5	4.2
Tokyo	6.3	214	i 1 44	+ 8	i 2 3	-49	i 2.9	3.0
Nagoya	8.0	226	1 55	- 6	(3 32)	- 5	3.5	4.0
Osaka	9.2	230	2 27	+ 8	—	—	4.5	5.6
Kobe	9.4	231	2 14	- 8	—	—	5.0	5.0
Nagasaki	14.0	239	3 33	+ 7	(6 18)	+10	6.3	—
Zi-ka-wei	20.6	249	i 4 43	- 5	e 8 29	- 7	—	14.4
Taihoku N.	24.6	236	e 5 18	- 7	9 46	- 9	14.5	—
Hong Kong	31.2	240	10 34	?	—	—	—	—
Manila	33.1	224	e 6 44	-13	—	—	—	—
Tiflis	69.8	308	—	—	—	—	e 36.7	—
Konigsberg	72.8	330	—	—	—	—	e 41.7	46.7
Lemberg	75.4	324	—	—	—	—	e 42.2	45.3
Hamburg	77.5	334	i 12 4	0	—	—	e 40.7	45.7
Budapest	79.0	325	i 12 16	+ 3	—	—	—	—
Vienna	79.5	328	12 15	- 1	—	—	—	—
Eskdalemuir	79.8	342	—	—	—	—	—	—
De Bilt	80.3	336	—	—	e 22 32	+ 5	e 38.7	45.4
Belgrade	80.4	323	e 12 33	+12	(e 22 18)	-10	50.0	—
Stonyhurst	80.9	341	e 28 14	?SR ₁	36 26	?	—	52.9
Uccle	81.7	336	e 12 44	+15	e 22 44	+ 1	e 38.7	42.7
Zagreb	82.1	326	e 12 27	- 4	e 22 38	- 9	e 42.7	53.7

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Innsbruck	82.2	330	e 12 32	+ 1	—	—	—	—
Oxford	82.5	340	—	—	—	—	46.1	48.7
Kew	82.5	339	—	—	—	—	—	55.7
Strasbourg	82.6	333	12 36	+ 2	e 23 31	+38	43.7	—
Paris	84.0	336	e 15 44	?	—	—	43.7	45.7
Besançon	84.3	333	e 13 07	+16	—	—	46.7	—
Florence	85.2	328	31 44	?L	—	—	(31.7)	53.6
Moncalieri	85.6	331	23 8	?S	(23 8)	-18	46.8	48.5
Rocca di Papa	86.3	326	—	—	23 50	+17	—	—
Tortosa N.	91.8	333	—	—	—	—	e 46.7	56.4
Algiers	94.5	330	—	—	—	—	e 50.7	59.7
Coimbra	95.0	340	e 5 44	?	e 17 44	?	51.7	—
Granada	96.4	335	18 40	?PR ₁	28 49	?	e 48.7	52.2
San Fernando	97.9	336	27 14	?S	(27 14)	+99	—	56.7
La Paz	143.2	58	19 41	[- 4]	—	—	69.0	77.0

Additional readings and notes : Osaka MN = +5.0m. Zi-ka-wei MNZ = +12.6m. Hamburg MZ = +49.7m. De Bilt ePR₁ = +15m.42s., MN = +52.6m. Epicentre 40° 0N. 143° 5E. Belgrade eS = +17m.29s. (?PR₁), true S being recorded as eL. Uccle SR₁ = +28m.8s., MN = +52.7m. Zagreb MNW = +48.7m. Innsbruck iNW = +12m.33s. Paris MN = +53.7m. Moncalieri S = +32m.27s., MN = +55.4m. Coimbra eN = +8m.39s. San Fernando MN = +65.7m.

May 15d. Readings also at 2h. (Manila), 4h. (Zi-ka-wei, De Bilt, and Calcutta), 6h. (near Tokyo and Mizusawa), 7h. (La Paz), 9h. (near Tokyo), 16h. (Tiflis).

May 16d. 8h. 6m. 45s. Epicentre 20° 0N. 121° 0E.

A = -.484, B = +.806, C = +.342; D = +.857, E = +.515 ; G = -.176, H = +.293, K = -.940.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Hokoto	3.8	339	0 52	- 7	1 17	-27	1.3	—
Taihoku N.	5.1	6	e 1 25	+ 6	—	—	2.5	2.7
Manila	5.4	180	e 1 29	+ 6	(2 31)	+ 3	2.5	3.6
Hong Kong	6.7	292	1 43	+ 1	—	—	4.2	4.9
Zi-ka-wei	11.2	2	e 2 48	+ 1	e 5 0	+ 1	—	9.4
Nagasaki	15.0	30	3 38	- 1	—	—	9.1	—
Kobe	19.4	37	4 32	- 2	8 27	+17	13.4	—
Osaka	19.5	38	4 40	+ 5	—	—	—	8.7
Nagoya	20.7	38	4 41	+ 8	—	—	—	—
Tokyo	22.8	42	i 5 18	+ 3	e 6 50	?	e 8.9	10.0
Mizusawa E.	25.8	38	5 33	-13	—	—	—	—
Batavia	29.7	209	e 6 17	- 8	i 11 57	+28	—	—
Calcutta	30.5	280	6 53	+20	—	—	—	—
Kodaikanal	43.0	265	23 15	?L	—	—	26.4	29.4
Konigsberg N.	79.4	325	—	—	—	—	e 47.2	50.2
Vienna	84.4	320	12 42	- 2	—	—	—	—
Zagreb	85.7	318	e 12 51	- 1	e 23 15	-12	e 47.2	58.2
Hamburg	85.7	326	—	—	—	—	e 46.2	54.2
De Bilt	89.0	325	—	—	e 23 33	-30	e 46.2	57.5
Strasbourg	89.4	322	—	—	—	—	—	54.2
Rocca di Papa	89.6	315	—	—	—	—	—	56.0
Uccle	90.1	325	e 23 33	?S (e 23 33)	—	-42	e 45.2	—
Edinburgh	90.8	331	—	—	—	—	—	58.2
Eskdalemuir	91.1	331	—	—	—	—	43.2	60.2
Moncalieri	91.2	320	e 14 1	+39	24 10	-16	45.2	—
Stonyhurst	91.7	329	e 30 39	?	—	—	—	59.8
Kew	92.1	327	—	—	—	—	—	60.2
Bidston	92.2	329	—	—	56 40	?L	(56.7)	61.8
Oxford	92.5	327	—	—	—	—	48.8	59.0
Coimbra	103.5	322	e 2 15	?	24 52	-97	35.2	—
La Paz	170.6	70	20 21	[+ 6]	24 3	?PR ₁	—	—

Additional readings and notes : Hokoto readings have been increased by 1m. Manila MN = +3.4m. Zi-ka-wei MN = +8.7m., MZ = +8.8m. Mizusawa PN = +5m.34s. Konigsberg ME = +52.9m. De Bilt MN = +57.4m. Bidston S = +57m.35s.

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May 16d. Readings also at 1h. (near Kobe), 2h. (Zi-ka-wei and Manila), 4h. (Zi-ka-wei, Konigsberg, Vienna, De Bilt, Strasbourg, Uccle, and Hamburg), 6h. (near La Paz) (2), 7h. (near Tokyo), 8h. (Manila, Taihoku, and La Paz) (2). These readings for La Paz are probably late phases of the above shock.) 9h. (near Athens), 10h. (Zi-ka-wei), 12h. (near Athens), 21h. (Rio Tinto), 23h. (near Tokyo).

May 17d. Readings at 6h. (Christchurch, Riverview, Melbourne, and Vienna), 11h. (Batavia), 18h. (near Nagoya, Osaka, and Kobe, and near Merida), 22h. (near Athens).

May 18d. Readings at 0h. (La Paz, Manila, and near Tacubaya), 2h. (near La Paz), 6h. (Otomari), 7h. (Zante), 13h. (Batavia, Hong Kong, Manila, and Zi-ka-wei), 21h. (La Paz), 22h. (Rio Tinto), 23h. (near Kobe).

May 19d. Readings at 9h. (Zi-ka-wei), 11h. (Merida), 13h. (near Tokyo), 15h. (Paris), 19h. (Zi-ka-wei), 20h. (La Paz), 21h. (near Tacubaya).

May 20d. Readings at 1h. (near Athens), 2h. (Tiflis), 11h. (near Tacubaya), 15h. (near Mizusawa), 17h. (Manila (2)), 22h. (near Tokyo).

May 21d. 5h. 9m. 10s. Epicentre 3°·0S. 128°·0E. (as on 1919 Feb. 17d.).

A = -·615, B = +·787, C = -·052; D = +·788, E = +·616;
G = +·032, H = -·041, K = -·999.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	18·9	339	e 4 21	- 7	—	—	6·8	—
Batavia	21·3	260	e 4 56	- 1	i 8 56	+ 6	—	—
Hong Kong	28·7	333	6 8	- 7	(10 17)	-55	10·3	—
Zi-ka-wei	34·8	350	e 7 18	+ 7	e 12 4	-48	—	—
Riverview	37·7	146	—	—	e 15 8	+94	e 25·5	28·5
De Bilt	E. 112·0	324	—	—	—	—	e 55·8	64·9
	N. 112·0	324	—	—	—	—	e 57·8	66·3
Eskdalemuir	114·7	332	—	—	—	—	52·8	—

Batavia gives also $i = +7m.8s.$ Riverview $e = +18m.26s., MN = +28·7m.$

May 21d. 15h. 40m. 40s. Epicentre 34°·0S. 73°·0W.

A = +·242, B = -·793, C = -·559; D = -·956, E = -·292;
G = -·163, H = +·535, K = -·829.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mendoza	4·1	74	(0 50)	-14	—	—	0·8	1·6
Cipolletti	6·3	143	5 20	?	—	—	6·2	7·8
Andalgala	E. 8·6	43	3 50	?	(3 50)	- 3	5·1	5·8
	N. 8·6	43	4 2	?S	(4 2)	+ 9	5·3	6·0
Chacarita	E. 12·1	97	3 2	+ 2	—	—	6·1	7·6
	N. 12·1	97	3 20	+20	—	—	6·2	6·6
La Quiaca	E. 13·5	30	4 14	+54	—	—	5·7	6·8
	N. 13·5	30	4 20	+60	—	—	5·8	6·8
La Paz	18·0	15	i 4 16	- 1	i 7 39	- 1	10·1	11·5
Coimbra	95·1	44	—	—	e 27 35	+143	e 48·3	—
Oxford	106·1	38	—	—	—	—	—	62·3
Bidston	106·2	36	50 25?	?L	55 20	?	(50·4?)	65·3
Eskdalemuir	107·3	34	—	—	e 25 20	-104	45·3	62·1
Moncalleri	107·5	46	—	—	—	—	e 58·1	—
Edinburgh	107·6	34	58 20	?L	—	—	(58·3)	—
Uccle	108·6	41	—	—	—	—	e 54·3	—
De Bilt	E. 109·7	41	—	—	e 28 32	+67	e 53·3	60·9
	N. 109·7	41	—	—	—	—	e 55·3	63·6
Hamburg	112·9	40	—	—	—	—	e 67·3	—
Zagreb	113·0	49	—	—	—	—	e 64·3	69·3
Colombo	143·1	131	76 20	?L	—	—	(76·3)	82·3

Additional readings: Coimbra gives also $e = +36m.5s.$
 $+28m.8s.$ Andalgala readings increased by 10 min.

Eskdalemuir $e =$

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May 21d. Readings also at 1h. (Rocca di Papa, Chicago, La Paz, Eskdalemuir, De Bilt, and Zagreb), 2h. (De Bilt), 3h. (Hong Kong), 4h. (Zagreb, Rocca di Papa, and near Belgrade), 7h. (near Mostar), 12h. and 14h. (La Paz), 19h. (Colombo and Tokyo).

May 22d. 17h. 33m. 18s. Epicentre 7°·5N, 79°·0W. (as on 1918 Mar. 21d.).

A = +·189, B = -·973, C = +·130; D = -·982, E = -·191;
G = +·025, H = -·128, K = -·991.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Hts.	E.	1·6	346	0 22	- 2	0 41	- 4	0·7	0·8
	N.	1·6	346	0 26	+ 2	0 44	- 1	—	—
Ann Arbor	N.	35·1	354	—	—	—	—	21·7	—
Toronto		36·1	0	—	—	—	—	42·5	—
Ottawa		38·0	4	e 19 12	?L	—	—	e 26·7	—
Victoria		55·3	326	(11 58)	+137	—	—	12·0	14·9
Eskdalemuir		75·7	35	—	—	—	—	e 29·7	—
Uccle		80·0	39	—	—	—	—	e 34·7	—
De Bilt	E.	80·5	38	—	—	—	—	e 30·7	42·0
	N.	80·5	38	—	—	—	—	e 29·7	42·5
Strasbourg		87·4	41	—	—	e 25 42	?	—	—
Zi-ka-wei		136·7	333	—	—	—	—	e 87·9	—

May 22d. 18h. 4m. 40s. Epicentre 24°·0N, 120°·0E. (as on 1920 Oct. 20d.).

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

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hokoto		0·6	222	1 0	+51	—	—	1·3	—
Taihoku		1·8	53	0 34	+ 6	—	—	0·9	1·7
Hong Kong		5·6	254	1 47	+20	—	—	3·8	4·7
Zi-ka-wei		7·3	10	e 2 20	+29	e 3 40	+22	—	4·8
Manila		9·5	172	e 2 20	- 3	—	—	—	—
Nagoya		18·5	49	7 48	?S	(7 48)	- 3	—	—
Colombo		42·1	252	10 20	+128	14 20	-16	24·3	29·3
Kodalkanal		42·8	260	26 20	?L	—	—	(26·3)	—
Tifis		63·6	309	—	—	—	—	e 35·3	42·3
Konigsberg	N.	75·8	325	—	—	—	—	e 40·3	43·3
Vienna		80·8	320	—	—	—	—	e 37·3	56·8
Hamburg		81·9	328	—	—	—	—	e 43·3	45·3
Zagreb		82·1	318	e 12 20	-11	—	—	45·3	55·3
De Bilt		85·2	326	—	—	e 23 22	+ 1	43·3	55·1
Dyce	N.	85·6	334	—	—	—	—	44·3	46·8
Strasbourg		85·7	322	—	—	—	—	e 47·3	—
Rocca di Papa		86·1	314	e 12 50	- 4	—	—	—	13·7
Uccle		86·3	327	—	—	—	—	e 44·3	48·3
Edinburgh		86·8	332	—	—	—	—	45·3	56·6
Eskdalemuir		87·2	332	—	—	—	—	41·3	49·6
Besançon		87·4	322	—	—	—	—	48·3	—
Moncalieri		87·6	319	14 3	+60	23 37	-11	45·0	57·3
Stonyhurst		87·8	330	e 24 20	?S	(e 24 20)	+30	—	52·3
Kew		88·2	329	—	—	—	—	—	56·3
Paris		88·4	326	—	—	—	—	e 47·3	—
Bidston		88·4	330	28 27?	?SR ₁	33 55	?	—	59·5
Oxford		88·6	329	—	—	—	—	43·3	58·0
Tortosa	N.	94·3	320	—	—	—	—	e 45·3	59·8
Coimbra		99·8	323	—	—	—	—	e 50·8	—
Rio Tinto		100·5	320	57 20	?L	—	—	(57·3)	67·3
Ottawa		109·1	12	—	—	—	—	57·3	—
Chicago		109·4	22	—	—	—	—	e 45·3	—

Additional readings and notes: Zi-ka-wei gives also MN = +5·6m., MZ = +5·7m. Konigsberg ME = +48·3m. Vienna readings are given 1h. late. De Bilt MN = +48·5m. Eskdalemuir MN = +57·0m. Moncalieri MN = +59·9m. Bidston P = +30m.20s., S = +35m.50s.?

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May 22d. Readings also at 2h. (La Paz and Tokyo), 3h. and 6h. (La Paz), 11h. (near Athens (2), Belgrade, Rocca di Papa, Zagreb, and De Bilt), 12h. (Manila), 17h. (Sydney and Riverview), 18h. (Hokoto and Taihoku (3)).

May 23d. Readings at 1h. (La Paz), 3h. (Honolulu), 6h. (La Paz and near Rocca di Papa), 8h. (near Belgrade), 13h. (Manila), 21h. (near Balboa Heights (2)).

May 24d. 21h. 17m. 25s. Epicentre 44°·5N. 11°·5E. (as on 1920 June 8d.).

A = +·699, B = +·142, C = +·701.

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Florence	0·7	0 13	+ 2	—	—	—	0·6
Padova	0·9	0 7	- 7	0 21	- 4	—	0·9
Moncalieri	2·7	0 20	-22	1 28	+14	2·8	—
Chur	2·7	0 47	+ 5	1 9	- 5	—	—
Innsbruck	2·7	i 0 38	- 4	—	—	—	—
Rocca di Papa	2·8	e 0 53	+ 9	e 1 35	+18	(e 1·6)	2·0
Zagreb	N.E. 3·4	0 57	+ 4	i 1 37	+ 3	—	2·0
Zurich	3·5	e 0 58	+ 3	i 1 29	- 8	—	—
Strasbourg	4·8	e 1 45	+31	e 2 3	- 8	—	—
Vienna	5·0	e 1 27	+10	—	—	—	3·2

Additional readings : Rocca di Papa gives also iSE = +1m.41s., eSN = +1m.47s. Zagreb iSNW = +1m.39s. Zurich eS = +1m.27s.

May 24d. Readings also at 1h. (Zi-ka-wei and Taihoku), 2h. (De Bilt and Hong Kong), 6h. (Taihoku), 8h. (Zi-ka-wei, Riverview, De Bilt, Manila Honolulu, Melbourne, and near Tokyo), 9h. (Riverview), 10h. (near Tokyo), 15h. (Batavia, Zi-ka-wei, and Manila), 17h. (near Mizusawa), 19h. (La Paz and near Tacubaya), 20h. (Rio Tinto), 21h. (De Bilt), 22h. (La Paz).

May 25d. 4h. 23m. 20s. Epicentre 44°·5N. 11°·5E. (as on 24d.).

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Florence	0·7	0 8	- 3	—	—	—	0·4
Padova	0·9	0 2	-12	0 11	-14	—	0·6
Innsbruck	2·7	e 0 40	- 2	—	—	—	—
Moncalieri	2·7	e 0 31	-11	1 29	+15	3·0	—
Rocca di Papa	2·8	1 34	+50	—	—	i 1·7	—
Zagreb	N.W. 3·4	e 0 52	- 1	e 1 34	0	—	1·9

Additional readings : Rocca di Papa e = +4s. Zagreb MNE = +2·0m.

May 25d. Readings also at 1h. (Malaga and near Granada), 3h. (near Tokyo), 4h. (La Paz), 9h. (near Tokyo), 10h. (Riverview), 14h. (near La Paz), 15h. (Taihoku), 20h. (Batavia).

May 26d. 8h. 34m. 18s. Epicentre 42°·5N. 7°·5E. (as on 1919 July 12d.).

A = +·731, B = +·096, C = +·676 ; D = +·130, E = -·991 ; G = +·689, H = +·088, K = -·737.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Rocca di Papa	3·9	99	i 1 0	- 1	i 1 48	+ 1	—	2·1
Padova	4·3	46	0 39	-28	(2 5)	+ 7	—	2·1
Chur	4·5	17	1 45	+35	—	—	—	—
Zurich	4·9	9	i 1 49	+33	i 3 17	?	—	—
Pompeii	5·5	106	0 22	-63	—	—	—	—
Strasbourg	6·0	2	i 1 36	+ 4	e 2 35	- 9	—	—
Zagreb	7·0	58	1 35	-11	e 2 45	-25	—	3·0
Göttingen	9·1	10	i 2 30	+12	—	—	—	—
Belgrade	9·6	72	e 3 0	+36	i 3 21	-57	—	—

Additional readings : Strasbourg gives also P = +1m.37s. Zagreb MNW = +2·8m. Belgrade iP = +3m.14s.

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May 26d. Readings also at 5h. (La Paz), 9h. (Honolulu), 15h. (Manila and Taihoku), 18h. and 19h. (Rio Tinto).

May 27d. Readings also at 0h. (Zurich and Chur), 1h. (Vienna), 2h. (Florence, Zagreb (2), Pompeii, Rocca di Papa (4), and Padova), 3h. (Rocca di Papa (2)), 5h. and 10h. (Rocca di Papa), 13h. (La Paz), 15h. (Rocca di Papa), 23h. (Coimbra, Manila, and Rocca di Papa).

May 28d. 12h. 9m. 0s. Epicentre $37^{\circ}2'N$. $139^{\circ}0'E$. (as on 1922 April 28d.).

$$A = -.601, B = +.522, C = +.605.$$

		Δ	P.	O-C.	S.	O-C.	L.	M.
		$^{\circ}$	m. s.	s.	m. s.	s.	m.	m.
Tokyo		1.7	10 21	- 5	10 35	-13	—	0.6
Mizusawa	E.	2.5	0 38	- 1	1 10	+ 1	—	—
	N.	2.5	0 39	0	1 9	0	—	—
Nagoya		2.7	0 42	0	—	—	1.9	1.8
Osaka		3.9	1 7	+ 6	—	—	2.3	2.9
Zi-ka-wei	Z.	15.7	e 3 38	-10	—	—	—	—

Additional readings: Tokyo gives $36^{\circ}8'N$. $139^{\circ}8'E$. Osaka MN = +2.6m.
Kobe ($\Delta = 4^{\circ}0'$) gives P = 12h.16m.

May 28d. Readings also at 0h. (Ottawa, Rocca di Papa, Melbourne, Riverview, De Bilt, Zi-ka-wei, Chicago, and Apia), 1h. (Zagreb, Eskdalemuir, Uccle, and near Mostar), 4h. (Zi-ka-wei, Riverview, Apia, Melbourne, and Chicago), 5h. (Ann Arbor, De Bilt, Ottawa, and Eskdalemuir), 13h. (Azores and Riverview), 14h. (Vienna), 15h. (Eskdalemuir, Uccle, Bidston, De Bilt, Zagreb, and near Athens), 16h. (Paris), 18h. (Belgrade).

May 29d. Readings at 1h. (Vienna), 8h. (Nagasaki), 11h. (Sydney, Adelaide, Riverview, Melbourne, Zi-ka-wei, and La Paz), 12h. (De Bilt), 19h. (De Bilt), 20h. (Manila and Batavia).

May 30d. Readings at 2h. (near Tokyo), 5h. (Chur and Zurich), 8h. (Kingston), 9h. (Zi-ka-wei), 12h. (Taihoku), 13h. (Manila and Zi-ka-wei), 21h. (Rio Tinto and near La Paz), 23h. (Taihoku).

May 31d. Readings at 1h. (near Lick and Berkeley), 3h. (La Paz (2)), 4h. (Zi-ka-wei), 6h. (near Tacubaya), 7h. (Manila (2) and La Paz (2)), 8h. (near Tokyo), 9h. (Manila), 10h. (La Paz), 13h. (Granada), 15h. (La Paz), 17h. (Zagreb, Coimbra, and near Belgrade), 20h. (Zi-ka-wei and near Taihoku).

June 1d. 16h. 18m. 26s. Epicentre $19^{\circ}5'N$. $120^{\circ}0'E$.

$$A = -.471, B = +.816, C = +.334; \quad D = +.866, E = +.500; \\ G = -.167, H = +.289, K = -.943.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m.	m.
Manila	5.0	169	1 17	0	(2 17)	0	2.3	3.5
Taihoku	5.7	14	e 1 28	0	—	—	2.3	—
Hong Kong	6.1	299	1 31	- 2	—	—	—	4.6
Zi-ka-wei	11.8	6	—	—	e 5 16	+ 2	—	8.5
De Bilt	88.8	326	—	—	—	—	e 48.6	57.2
Strasbourg	89.2	322	—	—	—	—	—	52.4
Uccle	89.9	325	—	—	—	—	e 46.6	—
Eskdalemuir	91.1	332	—	—	—	—	—	44.6

Additional readings: Manila gives also MN = +3.9m. De Bilt MN = +57.1m. Strasbourg reading has been decreased by 1h.

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June 1d. Readings also at 0h. (La Paz), 3h. (Taihoku), 21h. (near Tokyo).

1922. June 2d. 20h. 11m. 35s. Epicentre 8°0N. 128°0E.

(as on 1921 Nov. 11d.).

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	§L	m.	m.
Manila	9.5	314	e 2 35	+12	5 10	—	6.5	7.1
Taihoku	18.1	341	4 32	+14	(7 54)	+12	7.9	—
Hong Kong	19.6	319	4 35	-1	—	—	9.0	15.2
Zi-ka-wei	24.0	346	i 5 28	0	e 9 44	0	e 11.1	18.8
Nagasaki	24.8	4	5 37	+1	(10 19)	+20	10.3	—
Batavia	25.5	237	i 5 32	-11	i 9 50	-23	—	12.5
Osaka	27.5	13	6 6	+3	—	—	12.5	18.0
Kobe	27.5	13	6 6	+3	—	—	12.8	14.4
Tokyo	29.7	20	7 41	+76	e 10 31	+62	e 13.3	—
Mizusawa	E. 33.3	19	6 57	-2	12 26	-3	—	—
Calcutta	40.8	297	7 51	-10	17 39	?SR ₁	26.2	—
Adelaide	44.1	167	—	—	e 14 43	-20	e 21.4	26.9
Riverview	47.2	154	e 8 41	-7	e 15 27	-17	e 21.3	—
Colombo	47.8	271	8 55	+2	16 1	+10	27.4	35.4
Melbourne	48.4	161	8 46	-10	15 49	-10	23.3	28.7
Kodakanal	49.9	277	7 37	?	—	—	22.5	35.3
Bombay	54.5	288	10 39	+63	—	—	—	—
Honolulu	E. 72.3	70	11 45	+13	22 25	+91	39.5	42.9
	N. 72.3	70	11 57	+25	22 21	+87	—	42.4
Tiflis	79.7	311	12 31	+14	22 37	+17	38.4	42.4
Helwan	91.7	301	i 13 20	-5	23 45	-47	—	61.9
Lemberg	92.8	321	e 13 1	-30	e 36 7	?	51.4	62.0
Upsala	93.1	332	e 12 57	-36	e 23 53	-53	e 48.0	62.0
Konigsberg	93.3	326	13 30	-4	24 42	-6	e 49.9	59.0
Victoria	96.1	40	26 36	?S	(26 36)	+79	44.6	51.0
Belgrade	96.8	318	e 13 20	-33	e 23 26	?	63.5	—
Vienna	98.0	321	i 13 48	-12	25 21	-15	49.4	64.9
Zagreb	99.3	319	e 13 55	-12	i 25 22	-27	e 42.4	54.4
Hamburg	99.4	328	e 13 55	-12	e 24 25	-95	e 48.4	63.4
Berkeley	100.3	49	—	—	e 29 37	?	e 48.4	—
De Bilt	102.7	328	—	—	e 24 49	-92	e 48.4	66.9
Rocca di Papa	102.9	316	18 1	?PR ₁	—	—	e 20.4	—
Florence	103.1	318	52 25	?L	—	—	(52.4)	66.4
Strasbourg	103.1	322	i 14 15	-11	27 26	+61	62.4	—
Dyce	N. 103.2	335	18 34	?PR ₁	24 49	-97	55.4	59.4
Uccle	103.8	327	e 24 55	?S	e 33 19	?	e 48.4	66.4
Edinburgh	104.5	333	57 25	?L	(i 26 9)	-29	(57.4)	62.4
Besançon	104.7	323	e 25 45?	?S	(e 25 45?)	-54	61.4	—
Moncalieri	104.8	321	e 18 50	?PR ₁	28 17	+97	57.7	—
Eskdalemuir	104.9	333	e 18 55	?PR ₁	e 26 13	-28	50.4	—
Stonyhurst	105.5	331	e 8 25	?	—	—	—	16.9
Paris	105.9	325	—	—	e 25 4	-107	58.4	74.4
Kew	105.9	330	—	—	—	—	—	78.4
Bidston	106.0	331	—	—	—	—	—	61.2
Oxford	106.2	330	—	—	25 1	-113	—	64.2
Tortosa	N. 111.4	320	e 18 25	[-1]	28 50	+69	e 56.4	83.4
Algiers	111.8	314	e 19 28	?PR ₁	29 28	+104	e 54.4	69.9
Granada	116.1	318	e 18 57	[+16]	i 31 21	?	e 50.4	78.8
Coimbra	117.3	323	18 19	[-26]	29 43	+75	e 49.3	—
Rio Tinto	117.7	320	64 25	?L	—	—	(64.4)	77.4
Chicago	120.5	29	20 9	?PR ₁	30 11	+78	e 49.8	—
Ann Arbor	122.0	25	—	—	20 49	?PR ₁	73.4	—
Ottawa	122.5	18	i 20 49	?PR ₁	e 31 25	?	e 55.4	—
Toronto	122.7	21	—	—	—	—	55.3	—
Georgetown	E.N. 127.6	22	—	—	21 25	?PR ₂	87.4	—
Washington	127.6	22	20 5	?PR ₁	29 39	-5	—	—
Port au Prince	146.7	35	e 24 19	?PR ₁	—	—	—	24.4
La Paz	162.1	120	20 23	[+14]	35 2	?	80.3	83.8

Additional readings and notes : Manila gives also MN = +7.0m. Zi-ka-wei
PSE = +9m.58s., PSN = +10m.4s., PSZ = +10m.8s., SR₁E = +10m.20s.,
SR₁N = +10m.25s., MZ = +15.2m., MN = +16.7m. Batavia i =
+6m.53s. and +7m.12s. Osaka MN = +19.0m. Kobe MN =
+18.8m. Mizusawa PN = +6m.56s. Melbourne PR₁ = +10m.49s.

Notes continued on next page.

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Honolulu $SR_1N = +28m.25s.$, $SR_2N = +32m.35s.$, $T_0 = 20h.10m.38s.$ Tifis
 MN = +43.2m. Upsala MN = +64.1m. Königsberg SN =
 +24m.38s., MN = +56.3m. Victoria readings diminished by 1h.
 Belgrade L = +73.8m. Vienna i = +24m.47s. Hamburg MN =
 +66.4m. Berkeley eLNZ = +47.4m. De Bilt ePR₁ = +18m.30s.,
 MN = +72.6m. Florence readings have been increased by 1h. Stras-
 bourg PR₁ = +18m.49s. Edinburgh iM = +26m.9s. (S). Eskdale-
 mour e = +24m.59s. Stonyhurst readings are possibly 1h. in error.
 Paris MN = +64.4m. Granada iP = +19m.9s., i = +21m.21s., and
 +27m.20s., MN = +81.0m. Chicago L = +66.4m. and +86.4m.
 Ann Arbor LE = +87.4m. Ottawa e = +38m.57s. Toronto L? =
 +41.0m. and L = +75.6m. Georgetown LN = +68.4m. Port au
 Prince may record a local shock.

June 2d. Readings also at 0h. (Colombo), 11h. (Manila), 12h. (near Kobe), 15h. (near Tokyo), 16h. (Manila), 18h. (Ootomari), 19h. (Rio Tinto), 22h. (Perth).

June 3d. 4h. 14m. 0s. Epicentre 37°4N. 30°5E. (as on 1918 July 4d.).

A = +.684, B = +.403, C = +.607; D = +.508, E = -.862;
 G = +.523, H = +.308, K = -.794.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	5.4	278	i 1 20	- 3	(2 30)	+ 2	i 2.5	2.8
Helwan	7.6	174	1 58	+ 3	3 10	-16	—	3.3
Zagreb	13.7	313	e 3 24	+ 2	—	—	—	8.1
Rocca di Papa E.	14.4	293	i 3 24	- 8	—	—	—	—
Vienna	z. 14.9	321	i 3 44	+ 6	—	—	—	6.9
Strasbourg	19.9	311	e 4 45	+ 5	—	—	—	—
Hamburg	z. 21.5	326	e 5 1	+ 2	—	—	—	—
De Bilt	23.0	318	—	—	e 9 54	+29	—	—

Rocca di Papa gives also iPN = +4m.33s. (O-C = +1s.). Vienna iPZ = +3m.50s.

June 3d. 4h. 56m. 30s. Epicentre 37°0N. 141°0E. (as on 1922 Feb. 15d.).

A = -.621, B = +.502, C = +.602; D = +.629, E = +.777;
 G = -.468, H = +.379, K = -.799.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	1.7	217	i 0 25	- 1	0 44	- 4	—	—
Mizusawa	E. 2.1	2	0 39	+ 6	1 10	+12	—	—
Nagoya	3.8	242	0 53	- 6	1 38	- 6	1.6	1.8
Osaka	5.1	245	1 31	+12	—	—	2.6	4.0
Kobe	5.3	246.	0 20	-62	2 6	-19	2.9	4.1
Zi-ka-wei	17.2	256	e 4 7	0	e 7 24	+ 2	—	11.5
Manila	28.7	224	e 6 30	+15	—	—	—	—
Königsberg	75.0	330	—	—	—	—	e 47.2	48.0
Hamburg	80.0	334	—	—	—	—	e 42.5	—
Vienna	81.6	327	i 12 17	-11	—	—	—	13.2
De Bilt	E. 83.0	335	—	—	e 22 48	- 9	e 43.5	52.8
	N. 83.0	335	—	—	—	—	e 44.5	53.5
Zagreb	83.5	325	—	—	—	—	e 46.5	53.5
Stonyhurst	83.8	339	e 43 42	?L	—	—	(e 43.7)	55.5
Uccle	84.3	335	—	—	e 23 0	-11	e 43.5	—
Bidston	84.4	339	—	—	51 7	?L	(51.1)	56.2
Strasbourg	85.0	331	—	—	e 52 0	?L	56.0	—
Paris	86.6	334	—	—	—	—	e 52.5	54.5
Rocca di Papa	88.2	324	i 13 3	- 3	—	—	—	—
Ottawa	91.2	25	—	—	—	—	e 51.5	—
La Paz	147.1	60	19 45	[- 6]	—	—	—	—

Additional readings: Mizusawa gives also PN = +0m.38s. Nagoya MN = +2.0m. Osaka MN = +3.5m. Kobe MN = +3.0m. Bidston S = +51m.24s. (?!). Paris MN = +58.5m. Rocca di Papa iPN = +13m.0s. PR₁ = +16m.18s.

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June 3d. Readings also at 0h. (near Belgrade), 1h. (Ottawa, Manila, Chicago, and near Mazatlan), 2h. (Taihoku), 5h. (near Belgrade), 6h. (Apia), 8h. (near Colima), 9h. (Zi-ka-wei), 14h. (Azores), 21h. (Rio Tinto), 23h. (near Tacubaya).

June 4d. 17h. 48m. 24s. Epicentre 38°-0N. 23°-5E. (as on 1918 Jan. 1d.).

$$A = +.723, B = +.314, C = +.616.$$

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Athens	0.2	0 6	+ 2	—	—	0.5	0.6
Belgrade	7.2	e 1 53	+ 4	e 3 13	- 2	5.1	—
Rocca di Papa	9.1	e 1 58	- 20	—	—	—	6.4
Zagreb N.E.	9.6	e 2 18	- 6	—	—	—	5.6
De Bilt	19.0	—	—	—	—	e 10.1	—

Additional readings: Athens gives also $iP = +8s.$ Rocca di Papa $ePN = +1m.53s.$ Zagreb $MNW = +6.1m.$

June 4d. Readings also at 7h. (near Tacubaya), 9h. (near Taihoku), 12h. and 16h. (Manila), 17h. (near La Paz), 21h. (Manila and Ottawa), 23h. (near Batavia and near Colima).

June 5d. 4h. 31m. 5s. Epicentre 35°-0N. 22°-5E.

$$A = +.757, B = +.313, C = +.574; \quad D = +.383, E = -.924; \\ G = +.530, H = +.220, K = -.819.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3.1	18	e 0 54	+ 5	i 1 38	+12	i 2.0	2.0
Pompeii	8.5	315	2 25	+16	3 50	0	—	5.8
Mostar	9.0	338	i 3 24	+68	i 4 15	+12	i 4.5	4.8
Helwan	9.1	122	i 2 12	- 6	3 50	-16	—	7.3
Belgrade	9.9	352	i 3 20	+51	i 4 18	- 8	i 4.5	6.3
Rocca di Papa	10.2	314	e 2 33	0	i 5 1	+26	6.5	—
Zagreb N.E.	11.9	337	2 58	0	5 4	-13	e 5.5	—
N.W.	11.9	337	2 52	- 6	5 5	-12	—	8.5
Budapest	12.7	350	e 3 21	+12	e 6 7	+30	e 8.4	—
Padova	13.1	325	3 17	+ 3	7 40	?L	(7.3)	-11.3
Vienna	14.0	343	3 37	+11	6 21	+13	e 7.8	9.9
Innsbruck N.E.	14.8	329	e 3 35	- 1	e 6 36	+ 9	e 8.4	9.9
Lemberg	14.8	4	e 3 55	+19	—	—	e 7.8	9.3
Moncalieri	15.0	316	3 46	+ 7	- 7 2	+30	9.3	13.2
Algiers	15.8	282	i 3 55	+ 6	- 7 3	+13	—	12.4
Zurich	16.1	324	e 3 54	+ 1	i 7 6	+ 9	—	—
Barcelona	17.2	298	4 12	+ 5	—	—	e 9.5	16.6
Besançon	17.3	320	4 20	+11	7 35	+10	11.9	—
Strasbourg	17.4	326	3 59	-11	7 22	- 5	e 10.3	12.8
Tortosa N.	18.2	295	4 23	+ 4	7 50	+ 6	—	14.6
Puy de Dôme	18.2	312	2 5	?	—	—	—	—
Tiflis	18.7	62	e 4 37	+12	e 7 37	-18	e 11.6	13.1
Konigsberg	19.9	357	e 4 42	+ 2	8 21	0	e 11.6	11.9
Paris	20.2	320	e 4 45	+ 2	8 28	+ 1	11.9	14.9
Uccle	20.5	326	e 4 45	- 2	8 38	+ 4	e 11.5	—
Hamburg	20.5	339	4 43	- 4	e 8 41	+ 7	e 11.2	14.5
De Bilt	21.1	329	4 57	+ 3	8 44	- 2	11.4	13.7
Granada	21.1	284	i 4 52	- 2	i 9 3	+17	e 11.9	20.8
Rio Tinto	23.5	285	9 55	?S	(9 55)	+20	—	20.9
Oxford	23.8	322	5 27	+ 1	- 9 15	-25	13.9	16.4
Coimbra	24.9	291	e 5 43	+ 6	10 9	+ 8	e 13.1	21.7
Uppsala	25.0	354	e 5 32	- 6	9 58	- 5	e 13.4	15.1
Stonyhurst	25.7	325	9 55	?S	(9 55)	-21	(14.4)	19.4
Bidston	25.7	324	7 12	?	11 10	+54	—	18.0
Edinburgh	27.2	328	10 55	?S	(10 55)	+10	—	17.9
Dyce N.	27.7	331	—	—	10 30	-24	14.1	16.6
Chicago	80.1	315	e 12 25	+ 5	—	—	39.9	—
La Paz	99.8	257	13 58	-12	—	—	—	—

Additional readings: Athens gives also $iP = +0m.58s., iEN = +1m.28s., MN = +2.8m., T_0 = 4h.31m.3s.$ Rocca di Papa $eL = +10.4m., L = +12.9m.$
 Moncalieri $MN = +14.3m.$ Tiflis $MN = +15.0m.$ Konigsberg $MNZ = +14.6m.$ Paris $MN = +12.9m., T_0 = 4h.31m.10s.$ Hamburg $MZ = +14.4m., MN = +16.2m.$ Granada $i = +5m.4s.$ Coimbra $eSN = +10m.21s., T_0 = 4h.31m.14s.$ Uppsala $MN = +17.4m.$

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June 5d. 13h. 58m. 0s. Epicentre 42°-0N. 146°-0E.

A = -·616, B = +·416, C = +·669; D = +·559, E = +·829;
G = -·555, H = +·374, K = -·743.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	4·7	234	1 11	- 2	1 56	-13	—	—
Ootomari	5·2	334	1 28	+ 8	—	—	2·6	3·4
Tokyo	8·0	220	e 3 39	?S	(e 3 39)	+ 2	e 5·8	5·9
Osaka	11·0	232	3 25	+41	—	—	—	5·0
Kobe	11·2	233	3 19	+32	—	—	6·4	—
Zi-ka-wei	22·4	249	4 56	-14	e 8 56	-17	—	13·2
Manila	34·9	225	—	—	e 13 0	+ 6	—	—
Tifis	70·3	309	—	—	—	—	e 16·0	48·7
Hamburg	77·2	335	—	—	—	—	e 40·0	42·0
Vienna	79·4	329	—	—	—	—	e 44·0	50·5
De Bilt	E. 80·0	337	—	—	e 22 22	- 1	e 40·0	44·3
	N. 80·0	337	—	—	—	—	e 42·0	44·5
Budapest	80·2	326	—	—	—	—	e 42·2	—
Belgrade	80·5	324	—	—	(e 22 0)	-29	e 22·0	—
Bidston	80·9	341	—	—	—	—	—	55·8
Uccle	81·4	337	—	—	—	—	e 42·0	—
Zagreb	81·6	328	—	—	—	—	e 37·0	53·0
Strasbourg	82·3	334	—	—	—	—	44·0	—
Paris	83·7	338	—	—	—	—	e 45·0	46·0
Rocca di Papa	86·3	327	—	—	—	—	e 45·5	55·2
Coimbra	94·6	341	39 50	? e 45 30	?L	e 52·0	—	—
Rio Tinto	96·5	339	—	—	—	—	e 54·0	72·0

Additional readings: Ootomari gives also MN = +3·8m. Zi-ka-wei MZ = +13·7m. Tifis MZ = +49·6m. Bidston M is corrected by -1h. Zagreb MNW = +47·0m.

June 5d. 15h. 42m. 20s. Epicentre 42°-0N. 146°-0E. (as at 13h.).

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	4·7	234	1 12	- 1	1 59	-10	—	—
Ootomari	5·2	334	1 32	+12	—	—	2·6	—
Tokyo	8·0	220	e 3 18	?S	(e 3 18)	-19	e 4·6	4·7
De Bilt	80·0	337	—	—	e 22 46	+23	e 40·7	43·9

Additional readings: Mizusawa gives also PN = +1m.13s. De Bilt eLN = +42·7m.

June 5d. Readings also at 2h. (Zagreb), 9h. (Manila), 10h. (Taihoku and Zi-ka-wei), 16h. (De Bilt), 17h. (Strasbourg), 21h. (La Paz).

June 6d. Readings at 2h. and 6h. (Manila), 8h. (Zi-ka-wei), 11h. (Manila and Innsbruck), 15h. (Malaga and near Granada), 18h. (Colombo and near Tacubaya), 22h. (Taihoku).

June 7d. 17h. 52m. 56s. Epicentre 37°-0N. 138°-5E. (as on 1922 March 18d.).

A = -·599, B = +·529, C = +·602; D = +·663, E = +·749;
G = -·451, H = +·399, K = -·799.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	1·6	142	i 0 26	+ 2	i 0 37	- 8	i 11·0	1·0
Nagoya	2·2	214	0 56	+22	(0 56)	- 4	1·2	2·2
Mizusawa	2·9	44	0 46	+ 1	1 32	+12	—	—
Osaka	3·5	227	1 35	?S	(1 35)	- 2	2·9	3·6
Kobe	3·6	230	1 34	?S	(1 34)	- 5	2·7	—
Zi-ka-wei	z. 15·3	253	—	—	—	—	e 8·2	—

No additional readings.

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June 7d. Readings also at 9h. (La Paz), 14h. (Tortosa), 16h. (La Paz).

June 8d. 6h. 49m. 25s. Epicentre 43°·0N. 146°·0E. (as on 1921 Aug. 9d.).

A = -·606, B = +·409, C = +·682; D = +·559, E = +·829;
G = -·565, H = +·382, K = -·731.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	4·3	328	1 12	+ 5	(1 59)	+ 1	2·0	—
Mizusawa	E. 5·3	225	1 30	+ 8	2 32	+ 7	—	—
Tokyo	8·8	216	e 2 35	+22	—	—	e 2·8	2·9
Zi-ka-wei	Z. 22·7	247	e 5 6	- 7	—	—	—	—
Hamburg	Z. 78·3	334	i 11 44	-13	—	—	—	—
Vienna	Z. 78·6	329	e 11 57	-14	—	—	—	—
Zagreb	80·7	327	e 12 11	-12	—	—	—	—

Mizusawa gives also PN = +1m.28s.

June 8d. 7h. 47m. 40s. Epicentre 43°·0N. 12°·5E. (as on 1919 Sept. 10d.).

A = +·714, B = +·158, C = +·682; D = +·216, E = -·976;
G = +·666, H = +·148, K = -·731.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	1·2	311	0 25	+ 7	—	—	—	0·9
Rocca di Papa	1·3	173	i 0 20	0	i 0 42	+ 6	—	1·1
Padova	2·4	349	0 44	+ 7	1 7	+ 1	1·4	2·4
Pompeii	2·7	147	e 0 58	+16	1 28	+14	—	—
Zagreb	3·8	40	e 0 55	- 4	1 35	- 9	—	2·1
Moncalieri	4·0	302	—	—	—	—	e 2·4	—
Zurich	5·2	329	e 1 21	+ 1	2 56	?L	(2·9)	—
Vienna	Z. 5·9	26	e 2 11	+40	—	—	—	3·2
Belgrade	6·0	70	e 1 25	- 7	e 2 55	+11	—	3·4
Strasbourg	6·5	330	—	—	e 2 47	-10	—	3·9
De Bilt	10·3	334	—	—	—	—	e 6·3	—
Hamburg	10·7	352	—	—	—	—	e 6·3	—

Zagreb gives also MNW = +1·8m.

June 8d. Readings also at 3h., 5h., and 8h. (La Paz), 9h. (La Paz and Strasbourg), 10h. (Zi-ka-wei), 11h. (Ottawa, Chicago, Georgetown, and Ann Arbor), 13h. (La Paz), 14h. (Strasbourg), 18h. (Batavia), 19h. and 20h. (2) (Rio Tinto), 21h. (Zi-ka-wei and near Manila).

June 9d. 15h. 36m. 26s. (I) } Epicentre 43°·0N. 21°·0E.
16h. 13m. 20s. (II)

A = +·683, B = +·262, C = +·682; D = +·358, E = -·934;
G = +·637, H = +·244, K = -·731.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Belgrade	1·9	348	i 0 56	+27	i 1 33	+40	—	1·8
II	1·9	348	i 0 57	+28	i 1 33	+40	—	1·7
I Mostar	2·3	279	i 0 1	-35	i 0 14	-49	—	0·4
II	2·3	279	i 0 37	+ 1	i 0 51	-12	—	1·0
I Slnj	3·2	282	e 0 51	+ 1	i 1 11	-17	—	1·4
II	3·2	282	e 0 51	+ 1	i 1 11	-17	—	1·3
I Zagreb	N.W. 4·5	310	e 1 17	+ 7	i 1 37	-27	—	3·4
II	N.W. 4·5	310	e 1 16	+ 6	i 1 37	-27	—	3·2
I Budapest	4·7	345	e 1 45	+32	e 2 48	+39	3·8	—

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.
I Pompeii	5.3	247	e 1 19	- 3	3 14	?L	(3.2)	—
II	5.3	247	e 1 10	-12	3 20	?L	(3.3)	—
I Athens	5.5	156	e 1 15	-10	2 37	+ 6	e 2.9	3.3
II	5.5	156	e 1 23	- 2	2 43	+12	e 2.9	3.0
II	5.5	156	e 1 20	- 5	i 2 34	+ 3	—	3.2
I Vienna	6.2	331	e 2 42	?S	(e 2 42)	- 7	i 4.0	5.3
II	6.2	331	e 2 8	+33	—	—	i 3.6	5.2
I Rocca di Papa	6.2	261	i 1 41	+ 6	—	—	—	3.9
II	6.2	261	i 1 46	+11	—	—	—	4.2
I Padova	7.0	293	3 10	?S	(3 10)	- 0	4.1	—
II	7.0	293	3 8	?S	(3 8)	- 2	4.9	5.2
I Innsbruck	8.0	306	e 3 37	?S	(e 3 37)	0	e 4.6	—
II	8.0	306	e 2 4	+ 3	—	—	—	—
I Moncalieri	9.7	286	5 5	?L	—	—	(5.1)	—
II	9.7	286	3 14	+48	—	—	5.8	—
I Zurich	9.8	301	e 2 31	+ 4	i 4 33	+10	—	5.4
II	9.8	301	e 2 28	+ 1	e 4 33	+10	—	—
I Strasbourg	10.8	306	e 5 15	?S	(e 5 15)	+25	e 6.1	—
II	10.8	306	e 5 14	?S	(e 5 14)	+24	e 6.1	—
I Hamburg	12.8	330	—	—	—	—	e 6.6	—
II	12.8	330	—	—	—	—	e 7.7	—
I De Bilt	14.0	316	—	—	—	—	e 8.2	9.6
II	14.0	316	—	—	—	—	e 8.2	9.6

Additional readings : Athens I gives also $i = +2m.0s.$, $MN = +3.4m.$ Vienna I $i = +4m.32s.$, II $i = +4m.30s.$ Padova readings at I $+6m.48s.$ and $+6m.11s.$ Rocca di Papa I $PR_1 = +2m.34s.$, II $PR_1E = +2m.47s.$, and $PR_1N = +2m.51s.$ Zurich I alternative P $= +2m.28s.$, II $iS = +4m.45s.$

June 9d. Readings also at 4h. (Innsbruck and La Paz), 11h. (La Paz), 17h. (Zagreb, Belgrade (2), and Moncalieri), 22h. (near Zi-ka-wei), 23h. (near Zurich).

June 10d. Readings at 4h. (Melbourne), 5h. (Taihoku), 8h. (Zagreb), 9h. (Zi-ka-wei), 11h. (Rocca di Papa), 17h. (Zi-ka-wei), 21h. (Tifis).

June 11d. Readings at 5h. (Tifis), 6h. (Apia), 8h. (near Puebla), 11h. and 12h. (near Taihoku), 17h. (Zi-ka-wei and near Taihoku), 20h. (Taihoku).

1922. June 12d. 4h. 47m. 40s. Epicentre 24°0N. 107°0W.

A = - .267, B = - .874, C = + .407 ; D = - .956, E = + .292 ; G = - .119, H = - .389, K = - .914.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mazatlan	1.0	146	-0 1	-16	—	—	0.3	0.6
Collma	6.6	152	5 38	?	—	—	6.4	7.2
Tacubaya	8.4	122	2 9	+ 2	4 10	+23	4.5	5.6
E.	8.4	122	2 9	+ 2	4 6	+19	4.8	6.6
N.	8.4	122	2 13	+ 6	4 9	+22	4.7	6.1
Z.	9.0	338	2 6	-10	4 15	+12	4.5	7.1
Tucson	11.2	113	2 0	-47	4 20	-39	5.4	5.8
Vera Cruz	11.8	124	3 8	+12	7 0	?	7.7	8.7
Oaxaca	16.3	97	4 50	+54	8 5	?L	11.2	14.0
Merida	18.3	320	—	—	—	—	i 9.8	11.4
Lick	19.0	320	i 4 14	-15	—	—	e 9.6	14.5
Berkeley	20.4	40	i 4 56	+10	i 8 50	+18	e 9.8	11.8
St. Louis	24.0	37	5 23	- 5	9 53	+ 9	12.1	13.8
Chicago	26.6	41	5 50	- 4	10 50	+17	13.6	15.2
Ann Arbor								

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.
Victoria	Z.	27.6	336	e 6 20	+16	—	—	17.7	21.1
Georgetown	E.	29.4	52	e 6 14	8	11 24	0	16.7	19.3
	N.	29.4	52	e 6 20	-2	11 24	0	16.4	17.1
Washington		29.4	52	6 12	-10	11 20	-4	—	17.3
Cheltenham	E.	29.4	53	—	—	11 3	-21	14.2	17.2
	N.	29.4	53	—	—	12 8	+36	i 16.7	17.4
Toronto		29.9	42	7 2	-35	—	—	15.3	19.6
Balboa Heights	E.	30.2	116	7 15	+45	—	—	15.4	17.2
	N.	30.2	116	7 5	+35	13 15	+98	15.4	—
Ithaca		31.2	47	e 6 24	-16	11 46	-8	14.6	—
Fordham	E.	32.4	50	e 6 37	-15	e 12 8	-6	16.3	19.3
Port au Prince		32.7	93	e 6 50	-4	9 31	?	14.0	—
Ottawa		33.1	42	6 46	-11	11 19	-67	e 16.3	18.8
Northfield		34.5	45	e 5 50	-79	—	—	—	19.8
Porto Rico	E.	39.1	90	7 30	-17	13 46	-7	18.8	22.0
	N.	39.1	90	—	—	—	—	e 25.6	28.1
Honolulu	E.	47.0	277	e 9 40	+53	15 15	-26	e 24.4	26.8
	N.	47.0	277	—	—	15 10	-31	i 22.5	26.5
La Paz		55.5	133	i 9 45	+2	i 17 31	+3	i 23.5	24.7
Mendoza		67.8	146	19 2	-58	—	—	34.5	36.7
Cipolletti		72.7	149	29 26	?	—	—	45.3	47.4
Dyce	N.	77.6	32	e 11 53	-12	20 58	-58	34.6	41.3
Edinburgh		77.7	34	19 20	?S	(19 20)	-157	37.3	49.3
Bidston		78.7	36	23 13	?S	(23 13)	+65	—	48.6
Stonyhurst		78.9	36	20 32	?	27 38	?SR ₁	40.3	47.3
Oxford		80.5	38	12 34	+12	22 35	+6	34.0	47.2
Coimbra	E.	80.9	49	12 49	+25	22 49	+15	37.3	48.8
	N.	80.9	49	—	—	—	—	36.8	41.9
Kew		81.1	38	22 20	?S	(22 20)	-16	—	49.3
Rio Tinto		83.2	51	23 20	?S	(23 20)	+21	—	53.3
De Bilt		83.7	35	12 57	+17	23 9	+3	e 38.3	52.7
Uccle		84.0	36	e 12 47	+5	23 11	+4	e 35.3	49.2
Paris		84.0	38	e 12 59	+17	i 23 12	+3	e 35.3	41.3
Strasbourg		84.2	37	e 13 33	+50	23 46	+36	36.7	51.8
Upsala		84.8	25	e 13 4	+17	e 23 13	-4	e 38.4	43.0
Hamburg		85.4	31	e 13 20	+30	e 23 24	+1	e 37.3	53.2
Granada		85.6	50	e 12 45	-6	i 22 12	-74	e 24.8	42.2
Bortosa	N.	86.7	46	e 13 48	+51	23 44	+6	36.8	—
Besançon		86.8	39	e 13 19	+21	23 24?	+4	44.3	—
San Fernando		87.0	52	12 56	-3	—	—	43.1	52.7
Barcelona		87.4	44	e 18 20	?PR ₁	e 23 46	+1	e 42.6	44.7
Moncalieri		89.0	40	e 13 53	+43	i 24 4	+1	40.6	51.3
Konigsberg		89.3	27	e 15 1	?	—	—	e 38.6	50.3
Innsbruck		89.8	36	—	—	—	—	e 35.8	45.3
Algiers		90.5	48	e 13 12	-7	e 24 5	-14	41.3	45.8
Padova		91.2	38	17 12	?	24 12	-14	43.8	55.3
Vienna		91.8	33	e 13 22	-4	23 43	-50	e 38.3	50.2
Zagreb		93.2	36	e 13 28	-5	e 24 20	-27	e 37.3	46.7
Rocca di Papa		93.8	40	—	—	i 25 14	+20	e 43.4	45.4
Lemberg		94.4	29	e 21 2	?	e 31 2	?	e 42.0	50.8
Pompeii		95.5	40	—	—	—	—	58.3	—
Belgrade		96.2	34	e 13 3	-47	24 19	-59	e 40.9	54.8
Zi-ka-wei		107.9	317	e 18 36	?PR ₁	e 27 54	+45	—	70.9
Sydney		112.4	241	50 20	?L	—	—	(50.3?)	56.1
Melbourne		118.2	239	—	—	e 29 38	+62	e 53.3	68.6
Manila		119.3	305	e 21 20	?PR ₁	—	—	—	—
Simla	E.	124.7	356	e 57 32	?L	—	—	e 63.9	—
	N.	124.7	356	e 57 50	?L	—	—	e 63.6	—
Batavia	E.	143.0	293	i 21 36	?PR ₁	—	—	—	—
Kodaikanal		145.5	353	86 26	?L	—	—	(86.4)	—

Additional readings: Tucson LN = +4.9m., MN = +6.0m., T₀ = 4h.47m.8s.
 Lick iE = +14m.17s., Berkeley MN = +15.1m., Ann Arbor MN = +16.2m., T₀ = 4h.47m.18s., Georgetown iE = +14m.3s., Cheltenham
 SR₁E = +13m.1s., SR₁N = +12m.46s., LN = +15.9m., T₀ = 4h.47m.14s.
 Toronto eL = +34.8m. and +54.1m., Porto Rico PR₁E = +9m.4s.,
 PR₁N = +8m.53s., LE = +20.4m., T₀ = 4h.47m.15s., Honolulu SR₁N =
 +18m.28s., iSR₁E? = +20m.15s., T₀ = 4h.47m.30s., Bidston S =
 +28m.23s., Dyce i = +25m.58s., De Bilt MN = +50.6m., Uccle
 SR₁ = +28m.38s., MN = +40.7m., San Fernando MN = +51.5m.,
 Strasbourg MN = +45.3m., MZ = +51.7m., Hamburg MN = +51.2m.,
 Granada iP = +13m.7s., i = +13m.48s., and +23m.49s., PS = +24m.20s.,
 Barcelona MN = +56.2m., Moncalieri MN = +47.2m., Konigsberg
 MN = +48.8m., Padova PR₁ = +17m.50s., SR₁ = +24m.50s., Vienna
 PR₁ = +18m.38s., PS = +24m.47s., MN = +52.0m., Zagreb MNW =
 +55.9m., Belgrade L = +51.0m., LM = +60.0m.

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June 12d. 10h. 42m. 20s. Epicentre 19°-5N. 109°-0W.

A = -·307, B = -·891, C = +·334 ; D = -·946, E = +·326 ;
G = -·109, H = -·316, K = -·942.

		Δ	Az.	P.	O-C.	S	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mazatlan	E.Z.	4·4	34	—	—	—	—	2·1	3·2
Colima		5·3	105	1 28	+ 6	—	—	2·4	2·8
Tacubaya	E.	9·2	99	2 6	-13	3 54	-14	4·4	5·5
	N.Z.	9·2	99	2 6	-13	3 54	-14	4·5	5·6
Oaxaca		11·9	100	2 52	- 6	5 31	+14	6·4	6·9
	Z.	11·9	100	—	—	—	—	6·3	6·8
Vera Cruz		12·1	90	2 20	-40	—	—	6·0	8·2
Tucson	E.	12·9	353	—	—	6 26	+44	7·0	8·8
	N.	12·9	353	3 34	+22	—	—	7·6	9·4
Merida		18·2	82	5 4	+45	8 19	+35	11·5	14·5
St. Louis		25·1	37	e 5 40	+ 1	e 10 0	- 5	11·2	14·4
Chicago		28·7	35	6 13	- 2	10 45	-27	12·9	16·0
Victoria	Z.	31·1	342	—	—	—	—	19·7	22·4
Ann Arbor		31·2	38	e 6 52	+12	—	—	16·7	—
Georgetown		33·7	49	e 6 56	- 6	e 12 19	-17	e 18·7	—
Washington		33·7	49	7 32	+30	12 6	-30	—	—
Cheltenham	N.	33·7	50	—	—	e 14 59	+143	17·9	19·1
Toronto		34·6	40	8 10	+60	(e 12 46)	- 3	19·3	19·8
Ithaca		35·7	44	e 7 40	+21	e 12 40	-26	19·3	—
Fordham	N.	36·7	48	12 57	?S	(12 57)	-23	19·7	—
Ottawa		37·7	40	e 7 16	-20	i 13 17	-17	e 19·7	—
Northfield		39·0	43	—	—	—	—	e 16·7	—
Honolulu	E.	45·8	281	—	—	e 15 37	+12	21·5	23·4
	N.	45·8	281	—	—	e 15 50	+25	21·8	22·8
La Paz		53·9	130	19 34	+ 2	17 12	+ 4	—	28·0
Mendoza		65·2	143	20 34	?S	(20 34)	+67	33·7	36·1
Cipolletti		69·9	147	41 40	?	—	—	42·8	45·9
Edinburgh		82·4	34	—	—	22 40	-10	—	48·7
Bidston		83·4	36	21 18	?	24 3	+62	—	47·7
Oxford		85·1	37	—	—	i 23 18	- 2	—	52·2
Coimbra		85·2	49	e 13 8	+19	23 8	-13	39·7	—
De Bilt		88·5	35	—	—	e 24 0	+ 2	e 41·7	55·1
Uccle		88·7	35	—	—	e 24 2	+ 2	e 41·7	—
Paris		88·8	37	—	—	e 23 58	- 3	39·7	53·7
Granada		89·9	50	i 13 15	0	i 24 31	+18	—	50·9
Hamburg		90·2	31	—	—	e 23 40	-36	e 41·7	52·7
Tortosa	N.	91·2	44	—	—	—	—	e 39·7	47·2
Strasbourg		91·7	36	12 40	-45	24 23	- 9	49·7	—
Barcelona		92·0	43	—	—	—	—	e 50·1	—
Moncalieri		93·7	39	e 11 47	-109	24 25	-28	45·5	—
Konigsberg		94·1	26	—	—	—	—	e 52·6	53·7
Zagreb		97·9	35	—	—	e 23 40	-115	e 45·7	56·7
Zi-ka-wei	Z.	109·9	315	19 28	?PR ₁	e 29 12	+105	—	60·7
Melbourne		114·2	236	—	—	e 29 40	+96	e 53·0	64·2

Additional readings and notes : Colima readings are diminished by 4m. Tacubaya readings have been increased by 1h. Oaxaca readings have been increased by 2h. Vera Cruz gives also MN = +8·1m. Tucson gives also e = +4m.54s. Victoria readings have been increased by 1h. Georgetown eN = +6m.57s., eLN = +18·0m. Cheltenham eE = +22m.9s. Ithaca eN = +15m.10s. Fordham PE = +13m.2s., all readings diminished by 1h. Ottawa i = +17m.44s. Honolulu eE = +20m.20s., eN = +19m.58s. Coimbra eLN = +38·7m. De Bilt MN = +55·9m. Granada i = +17m.5s. and +24m.18s. (?S). Hamburg MN = +56·7m. Zagreb MNW = +59·7m.

June 12d. Readings also at 2h. (Mizusawa), 3h. (Mizusawa (2) and Ootomari), 5h. (La Paz and Budapest), 6h. (Moncalieri and near Lick), 7h. (Melbourne), 8h. (near Belgrade), 9h. (Rocca di Papa), 12h. (Riverview and Manila), 13h. (La Paz), 14h. (Riverview), 15h. (Melbourne, De Bilt, and Moncalieri), 16h. (Innsbruck), 21h. (Strasbourg and Zurich), 22h. (Nagasaki).

June 13d. Readings at 0h. (Zagreb and near Zurich), 3h. (near Lick and near Merida), 4h. (Zi-ka-wei), 5h. (De Bilt), 6h. (near Taihoku), 7h. (Coimbra), 10h. (Nagoya), 16h. (near Nagasaki), 21h. (Zagreb).

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June 14d. Readings at 3h. (La Paz), 6h. (near Coimbra (2)).

June 15d. Readings at 7h. (near Tokyo), 8h. (near Rocca di Papa), 15h. (Chicago, Zagreb, and near Belgrade), 19h. (near Tokyo), 20h. (Zagreb and Sinj).

June 16d. 5h. 47m. 8s. Epicentre 39°·0N. 23°·0E. (as on 1918 Feb. 11d.).

A = +·715, B = +·304, C = +·629 ; D = +·391, E = -·920 ;
G = +·579, H = +·246, K = -·777.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	1·2	151	e 0 17	- 1	—	—	0·8	1·0
Belgrade	6·1	342	e 1 34	+ 1	e 2 22	-24	—	3·2
Rocca di Papa	8·4	294	e 1 34	-33	—	—	—	4·1
Zagreb	8·5	325	—	—	e 3 52	+ 2	—	—

Additional readings: Athens gives also MN = +1·2m. Rocca di Papa
ePN = +1m.28s. Zagreb L = 6h.28m.

June 16d. 20h. 59m. 40s. Epicentre 30°·0N. 114°·0W. (as on 1921 June 17d.).

A = -·352, B = -·791, C = +·500 ; D = -·914, E = +·407 ;
G = -·203, H = -·457, K = -·866.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tucson	E. 3·5	50	0 36	-19	—	—	1·9	2·1
	N. 3·5	50	0 46	- 9	1 14	-23	1·5	1·7
Lick	E. 9·7	322	i 3 18	+52	i 4 36	+15	—	5·0
Victoria	19·7	342	6 41	?	—	—	7·8	11·0
St. Louis	21·4	60	i 4 32	-26	9 20	+27	10·8	—
Ann Arbor	27·2	55	—	—	e 10 26	-19	14·0	15·0
Toronto	30·6	52	—	—	(11 44)	0	11·7	17·4
Georgetown	31·5	63	—	—	e 12 57	+57	(16·1)	—
Washington	31·5	63	—	—	e 12 6	+ 6	16·8	—
Cheltenham	N. 31·6	63	—	—	12 11	+10	16·3	17·8
Ithaca	32·4	58	—	—	e 13 20	+66	e 16·3	—
Ottawa	33·5	52	—	—	e 11 27	-65	e 16·3	17·3
Fordham	34·1	61	—	—	e 15 56	?SR ₁	17·3	—
Northfield	35·4	55	—	—	—	—	e 17·3	—
Honolulu	E. 40·4	268	—	—	e 16 38	?SR ₁	e 18·0	21·9
	N. 40·4	268	6 40	-78	—	—	e 16·8	21·4
De Bilt	82·2	33	—	—	—	—	e 40·3	48·9
Uccle	82·6	34	—	—	—	—	—	41·3
Strasbourg	85·8	35	—	—	—	—	e 42·3	—

Additional readings and notes: Lick iE = +3m.36s. and +4m.1s. Ann Arbor
i = +13m.44s. Toronto readings have been increased by 5h. Cheltenham
L = +16·9m. Ottawa i = +14m.20s. De Bilt MN = +56·0m.

June 16d. Readings also at 10h. (near Algiers), 11h. (Ottawa), 12h. (Batavia, Colombo, Kodaikanal, Ottawa, Georgetown, and Ann Arbor), 20h. (Porto Rico).

June 17d. 2h. 34m. 0s. Epicentre 0°·5N. 130°·0E.

A = -·643, B = +·766, C = +·009 ; D = +·766, E = +·643 ;
G = -·006, H = +·007, K = -1·000.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	16·7	328	e 4 0.	- 1	(6 48)	-23	6·8	—
Batavia	24·1	253	i 5' 28	- 1	i 9 47	+ 1	—	—
Taihoku	25·8	342	—	—	e 11 0	+42	11·1	11·1
Zi-ka-wei	31·7	346	e 6 43	- 1	—	—	—	—
Riverview	39·7	152	—	—	e 25 0	?	e 27·5	e 28·2
De Bilt	110·1	328	—	—	—	—	e 56·0	—
Strasbourg	110·3	323	—	—	—	—	—	81·0
Uccle	111·2	327	—	—	—	—	e 58·0	—

Additional readings and notes: Batavia gives also iE = +7m.7s., T =
2h.34m.11s. Epicentre 2°·4N. 129°·3E. Taihoku readings are diminished
by 10m.

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June 17d. Readings also at 5h. (Colombo, Kodaikanal, and near Athens (2)), 6h. (near Athens), 8h. (Rocca di Papa, Zagreb, and Pompeii), 9h. (Zagreb), 12h. (near Manila), 14h. (Tiflis), 16h. (Pompeii, Zagreb, and Rocca di Papa), 23h. (Zagreb and near Tucson).

June 18d. 12h. 14m. 25s. (i) } Epicentre 36° 1N. 137° 3E. (as on 1922 May 4d.).
 12h. 17m. 20s. (ii) }

A = -594, B = +548, C = +598 ; D = +678, E = +735 ;
 G = -433, H = +400, K = -808.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Nagoya	1-0	196	0 16	+ 1	—	—	—	—
II	1-0	196	—	—	(0 22)	- 6	0-4	0-9
II Tokyo	2-0	100	0 39	+ 8	—	—	e 1-3	1-8
I Osaka	2-1	218	0 37	+ 4	(0 57)	- 1	1-0	1-2
II	2-1	218	0 31	- 2	(0 53)	- 5	0-9	1-2
I Kobe	2-2	231	0 35	+ 1	(0 58)	- 2	1-0	1-0
II	2-2	231	1 0 29	- 5	(0 57)	- 3	1-0	1-0
II Mizusawa	4-3	45	1 27	+20	3 2	?L	(3-0)	—
II Zi-ka-wei	14-1	254	—	—	e 5 48	-22	—	9-1
II Manila	26-0	218	e 9 11	?S	(e 9 11)	-71	—	—
II De Bilt	82-5	332	—	—	—	—	e 49-7	55-9
II La Paz	150-1	56	20 7	[+11]	—	—	—	—

Additional readings : Osaka gives also MN = +1-1 (both shocks). Mizusawa
 II PN = +1m.29s. De Bilt II MN = +52-7m.

June 18d. Readings also at 6h. (Coimbra), 7h. (Pompeii, Rocca di Papa, and Zagreb), 12h. (near Tokyo), 15h. (Tiflis), 17h. (Granada), 18h. (near Belgrade, Zagreb, and Athens), 19h. (near Helwan), 20h. (Zagreb and near Belgrade), 21h. (Zagreb, Zante, and near Athens), 22h. (Riverview).

June 19d. 0h. 39m. 12s. Epicentre 40° 5N. 26° 0E. (as on 1917 Dec. 27d.).

A = +683, B = +333, C = +649 ; D = +438, E = -899 ;
 G = +584, H = +285, K = -760.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3-1	214	e 0 55	+ 6	—	—	1-6	2-2
Belgrade	5-9	319	e 1 57	+26	i 4 24	?	—	4-8
Zante	6-4	246	—	—	—	—	—	3-8
Zagreb	9-0	309	e 4 6	?S	(e 4 6)	+ 3	i 5-3	7-5
Vienna	10-3	322	—	—	e 4 30	- 7	—	7-8
Moncalieri	14-1	295	—	—	e 7 18	?L	10-2	—
Tiflis	14-2	79	e 12 24	?	—	—	—	—
Uccle	18-2	312	—	—	—	—	e 9-8	—
De Bilt	18-4	316	—	—	e 7 42	- 7	e 9-9	—

Additional readings : Athens gives also MN = +2-8m. Zagreb MNW = +6-0m.

June 19d. Readings also at 4h. (La Paz), 14h. (Zante, Zagreb, and near Athens), 15h. (De Bilt), 23h. (Manila).

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June 20d. 8h. 46m. 45s. Epicentre 32°·0N. 126°·0E.

A = -·498, B = +·686, C = +·530.

Very rough.

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki	3·3	0 43	- 9	—	—	1·3	1·7
Zi-ka-wei	4·0	—	—	e 1 52	+ 2	—	5·6
Kobe	8·1	e 2 36	+33	—	—	—	—
Osaka	8·3	2 11	+ 5	—	—	—	6·2
De Bilt	81·3	—	—	—	—	e 46·2	—

June 20d. 9h. 43m. 6s. Epicentre 13°·0N. 120°·0W.

A = -·487, B = -·844, C = +·225; D = -·866, E = +·500;
G = -·113, H = -·195, K^{*} = -·974.

Very rough.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz	59·1	120	i 10 6	0	18 13	+ 1	29·0	31·4
Mendoza	67·3	136	11 48	+48	(21 42)	+108	21·7	22·8
Pilar	E. 69·9	133	11 12	- 4	—	—	22·6	26·6
	N. 69·9	133	11 12	- 4	—	—	24·2	28·2
Cipolletti	71·0	140	21 24	?S	(21 24)	+46	25·9	32·9
Riverview	96·3	236	—	—	—	—	e 49·4	—
Coimbra	97·3	46	—	—	—	—	e 53·9	—
De Bilt	E. 99·6	31	—	—	e 48 24	?L	e 60·9	62·7
	N. 99·6	31	—	—	—	—	e 61·9	65·6
Zi-ka-wei	Z. 106·4	310	e 21 23	?PR ₁	—	—	—	85·3

No additional readings.

June 20d. Readings also at 1h. (near Mizusawa), 6h. (Kodaikanal), 15h. (near Apia and Riverview), 21h. (near Zurich), 22h. (Zagreb), 23h. (near Algiers and near Mostar).

June 21d. Readings at 6h. (Zi-ka-wei and Riverview), 7h. (Melbourne), 9h. (near Mostar), 10h. (Zagreb), 12h. (near Tacubaya), 13h. (Zi-ka-wei, Honolulu, and near Tokyo and Mizusawa).

June 22d. 23h. 15m. 15s. Epicentre 37°·5N. 19°·7E. (as on 1918 July 9d.).

A = +·747, B = +·267, C = +·609; D = +·337, E = -·941;
G = +·573, H = +·205, K = -·793.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·2	81	e 0 49	- 1	e 1 30	+ 2	i 1·6	2·0
Rocca di Papa	6·8	311	e 1 40	- 4	—	—	(e 3·4)	4·8
Belgrade	7·3	4	e 3 32	?S	(e 3 32)	+14	(e 4·9)	6·2
Zagreb	8·8	341	e 3 39	?S	(e 3 39)	-19	e 4·8	5·0
Vienna	11·0	348	e 4 27	?S	(e 4 27)	-27	—	8·2
Strasbourg	14·1	326	e 8 2	?L	—	—	(e 8·0)	—
Uccle	17·2	325	—	—	—	—	e 9·8	—
Konigsberg	17·3	2	—	—	e 8 25	+60	—	16·8
De Bilt	17·8	329	—	—	e 7 39	+ 3	e 10·2	—

Additional readings: Athens gives also SN = +1m.32s., MN = +2·6m., T₀ = 23h.15m.11s. Rocca di Papa eN = +2m.4s., SN = +4m.18s., SE = +4m.28s. Zagreb MNW = +6·0m. Strasbourg e = +9m.0s.

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June 22d. Readings also at 0h. (De Bilt, Zi-ka-wei, and near Taihoku), 2h. (near Mizusawa), 10h. (Berkeley and near Tokyo), 12h. (Belgrade), 13h. (near Manila), 15h. (near Tokyo), 16h. (Zi-ka-wei and near Taihoku (3)), 17h. (near Taihoku), 19h. (near Mizusawa and Tokyo), 20h. (Zi-ka-wei, Vienna, Apia, Honolulu, Strasbourg, and Zagreb), 21h. (Uccle, De Bilt, Strasbourg, and near Berkeley).

June 23d. Readings at 0h. (Zagreb), 1h. (Nagoya and near Tokyo), 4h. (Taihoku), 8h. (near Oaxaca), 10h. (Malaga), 12h. (Paris), 15h. (near Mizusawa), 16h. (Merida and Tiflis), 17h. (Zagreb), 20h. (near Taihoku).

June 24d. 16h. 27m. 35s. Epicentre 6°·3N. 123°·2E. (as on 1919 Sept. 26d.).

A = -·544, B = +·832, C = +·110 ; D = +·837, E = +·548 ;
G = -·060, H = +·092, K = -·994.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	8·6	346	e 2 16	+ 6	4 3	+10	4·5	6·0
Hong Kong	18·4	332	4 15	- 7	(7 45)	- 4	7·8	—
Batavia	20·6	233	4 43	- 5	i 8 43	+ 7	—	—
Zi-ka-wei	z. 25·0	356	6 32	+54	e 10 54	+51	—	15·7
Colombo	43·0	273	8 25	+ 7	18 25	?	28·4	30·4
Vienna	z. 96·3	321	e 17 30	?	PR ₁	—	—	—
Zagreb	97·2	313	e 13 25	-30	—	—	50·4	—
Strasbourg	101·5	321	—	—	—	—	57·4	—
De Bilt	E. 101·6	325	—	—	—	—	e 54·4	59·7
	N. 101·6	325	—	—	—	—	e 53·4	57·3
Eskdalemuir	104·2	332	—	—	—	—	56·4	—
La Paz	165·0	134	20 15	[+ 3]	—	—	—	—

Additional readings : Manila gives MN = +5·0m. De Bilt gives epicentre 5°·8N. 123°·3E.

June 24d. Readings also at 1h. (Zagreb), 7h. (Taihoku), 10h. (Mizusawa and Lemberg), 12h. (Mizusawa), 13h. (Manila), 21h. (Christchurch and Riverview), 22h. (Manila, Vienna, and Zi-ka-wei), 23h. (Manila).

June 25d. 18h. 41m. 16s. Epicentre 36°·0N. 141°·0E. (as on 1921 Nov. 29d.).

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 20	+ 3	i 0 27	- 4	i 0·5	0·5
Mizusawa	E. 3·1	1	0 48	- 1	1 29	+ 3	—	—
Nagoya	3·4	256	0 41	-12	—	—	—	—
Osaka	4·7	256	1 16	+ 3	(2 6)	- 3	2·1	2·7

Additional readings : Mizusawa gives also PN = +50s. Nagoya reading is increased by 1m.

June 25d. Readings also at 6h. (near Mizusawa), 8h. (near Merida), 11h. (La Paz, Paris, and near Balboa Heights), 12h. (Bidston), 13h. (Paris and Rocca di Papa), 15h. (Barcelona (2)), 14h. (Batavia and Algiers), 19h. (Port au Prince).

June 26d. Readings at 12h. (Batavia), 15h. (near Taihoku), 18h. (near Merida), 19h. (Manila), 21h. (Manila (2) and Port au Prince).

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1922. June 27d. 14h. 29m. 55s. Epicentre 6°5N. 126°0E.

(as on 1921 Nov. 7d.).

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o.	o.	m. s.	s.	m. s.	s.	m.	m.
Manila	9.5	330	e 2 19	- 4	5 15	?L	6.2	8.4
Taihoku	19.0	347	e 4 32	+ 3	(7 49)	-13	7.8	—
Hong Kong	19.5	326	i 4 23	+ 2	8 9	- 4	10.0	—
Batavia	22.9	237	i 5 14	- 2	9 31	+ 8	—	—
Zi-ka-wei	25.0	351	5 49	+11	e 10 11	+ 8	—	16.3
Kobe	29.4	15	e 6 7	-15	—	—	14.7	17.0
Osaka	29.5	16	e 6 28	+ 5	—	—	—	18.0
Tokyo	31.8	21	e 6 43	- 2	e 13 15	+70	e 17.6	—
Calcutta	39.7	299	6 40	-72	—	—	16.7	—
Colombo	45.9	273	9 35	+56	—	—	16.1	17.1
Riverview	46.8	151	e 8 17	-29	e 15 33	- 5	e 22.3	—
Sydney	46.9	151	8 47	+ 1	—	—	25.1	30.1
Melbourne	47.7	160	—	—	e 13 23	-147	21.6	32.8
Kodaikanal	48.2	278	9 23	+28	—	—	28.8	32.9
Simla	51.8	308	—	—	e 16 23	-18	—	—
Honolulu	74.7	69	11 25	-22	e 21 50	+28	36.1	45.4
Tiflis	79.1	313	e 11 59	-15	e 21 41	-32	e 42.1	54.6
Konigsberg	93.4	326	i 19 30	?PR ₁	23 37	-72	e 52.1	60.6
Belgrade	96.3	317	e 13 8	-43	i 27 52	+153	—	—
Victoria	98.6	40	—	—	26 23	+41	47.6	50.8
Zagreb	99.0	318	e 13 35	-30	e 24 17	-89	e 51.1	66.1
Hamburg	99.7	327	—	—	e 21 5	?	e 55.1	61.1
Innsbruck	101.4	321	—	—	22 35	?	53.6	—
Straasbourg	102.4	321	e 13 56	-26	25 49	-30	e 55.1	62.1
Rocca di Papa	102.6	315	e 23 29	?	—	—	55.3	—
Berkeley	102.8	49	e 17 59	?PR ₁	—	—	—	—
De Bilt	102.9	327	—	—	—	—	e 55.1	64.4
Uccle	104.0	326	—	—	—	—	e 51.1	68.1
Moncalieri	104.6	320	e 11 14	?	24 38	-120	45.6	—
Edinburgh	105.0	333	—	—	—	—	57.1	67.1
Eskdalemuir	105.4	333	—	—	i 26 3	-43	54.1	66.8
Stonyhurst	105.9	331	e 18 35	?PR ₁	—	—	—	69.9
Paris	106.1	324	—	—	e 28 5	+72	58.1	66.1
Kew	106.1	328	—	—	—	—	—	69.1
Bidston	106.4	331	47 15?	?	53 52?	?L	(53.9?)	69.1
Oxford	106.4	328	—	—	—	—	—	66.1
Tortosa	N. 111.2	319	—	—	—	—	57.1	70.4
Coimbra	117.4	322	26 35	?S	(26 35)	-114	e 61.1	—
Chicago	122.8	29	20 24	?PR ₁	30 5	+55	63.1	—
Ann Arbor	124.2	25	e 18 53	?PR ₁	(26 47)	-153	26.8	—
Ottawa	124.7	18	i 20 35	?PR ₁	e 30 45	+81	e 57.6	—
Toronto	124.9	20	i 22 23	?PR ₁	i 29 11	-14	71.7	—
Georgetown	N. 129.8	21	—	—	e 30 37	?	52.1	—
Washington	129.8	21	e 22 10	?PR ₁	—	—	—	—
La Paz	162.9	127	e 20 5	[- 5]	34 8	?	78.4	81.8

Additional readings : Manila gives also MN = +8.6m. Batavia i = +7m.6s.
Zi-ka-wei PSN = +10m.20s., PSZ = +10m.21s., PSE = +10m.44s., SR,N =
+11m.50s., SR,Z = +11m.55s., MZ = +16.5m. Osaka MN = +24.2m.
Honolulu SE = +20m.50s., LE = +33.6m., T₀ = 14h.29m.54s. Tiflis
e?? = +10m.23s., MN = +53.5m. Konigsberg MN = +64.1m. Belgrade
PR₁ = +18m.54s. Zagreb MNW = +54.1m. Victoria +31m.35s.,
L? = +41.7m. De Bilt MN = +57.8m. Epicentre 3°2N. 128°0E.
Straasbourg MN = +71.1m. Uccle MN = +65.1m. Eskdalemuir e =
+24m.43s. Paris MN = +59.1m. Tortosa readings have been increased
by 3h. Ottawa L = +69.1m. Toronto e = +32m.29s.

June 27d. Readings also at 1h. (Algiers), 13h. (La Paz, Riverview, and Kodaikanal), 14h. (Kodaikanal), 17h. (near Tacubaya), 18h. (near Athens).

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June 28d. Readings at 0h. (Colombo, Riverview, Zi-ka-wei, and La Paz), 1h. (Kodaikanal), 10h. (Almeria, Malaga, and near Granada), 18h. (Zi-ka-wei and La Paz), 19h. (Colombo), 20h. and 21h. (3) (near Tacubaya)

June 29d. 4h. 49m. 57s. Epicentre 31°·5N. 141°·5E.

A = -·667, B = +·531, C = +·522 ; D = +·623, E = +·783 ;
G = -·409, H = +·325, K = -·853.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	4·4	342	i 1 13	+ 5	—	—	e 5·5	—
Nagoya	5·3	315	2 32	?S	(2 32)	+ 7	—	—
Osaka	6·0	304	1 46	+14	—	—	3·9	7·4
Kobe	6·2	303	e 2 49	?S	(e 2 49)	0	e 4·4	—
Mizusawa	E. 7·7	358	1 57	0	3 28	- 1	—	—
	N. 7·7	358	1 56	- 1	3 29	0	—	—
Nagasaki	9·9	281	6 23	?L	—	—	(6·4)	—
Zi-ka-wei	Z. 17·1	274	4 3	- 3	e 7 19	- 1	—	11·5
Manila	25·2	233	e 4 45	-55	—	—	—	—
De Bilt	N. 88·1	335	—	—	—	—	e 50·0	58·4
Uccle	89·4	335	—	—	—	—	e 48·0	—
Strasbourg	89·9	332	—	—	—	—	e 53·3	—
La Paz	149·2	68	19 40	[-14]	—	—	—	—

Additional readings : Osaka gives also MN = +7·2m. De Bilt eLE = +49·0m.

June 29d. 10h. 30m. 20s. (i) } Epicentre 37°·5N. 19°·7E. (as on June 22d.).
17h. 10m. 15s. (ii)

A = +·747, B = +·267, C = +·609 ; D = +·337, E = -·941 ;
G = +·573, H = +·205, K = -·793.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Athens	3·2	81	e 0 56	+ 6	e 1 34	+ 6	1·6	2·3
II	3·2	81	e 0 26	-24	—	—	1·1	1·2
I Pompeii	5·2	310	e 2 15	?S	(e 2 15)	- 7	—	—
I Rocca di Papa	E. 6·8	311	e 1 41	- 3	e 4 16	?L	(e 4·3)	—
II	6·8	311	e 1 39	- 5	e 4 3	?L	(e 4·0)	4·2
I Belgrade	7·3	4	e 2 23	+32	e 3 52	?L	(e 5·2)	—
II	7·3	4	e 1 49	- 2	e 3 47	?L	(e 3·8)	4·7
I Zagreb	8·8	341	e 2 10	- 3	e 3 57	- 1	—	5·6
II	8·8	341	e 2 15	+ 2	—	—	e 4·8	5·2
I Strasbourg	14·1	326	—	—	—	—	e 8·0	—
II	14·1	326	—	—	—	—	e 8·0	—
I Hamburg	17·4	340	—	—	—	—	e 10·7	—
I De Bilt	17·8	329	—	—	—	—	e 10·7	—
II	17·8	329	—	—	—	—	e 10·8	—

Additional readings : Athens (i) gives also MN = +2·0m. Athens (ii) MN = +1·6m. Rocca di Papa (i) ePN = +1m.40s., eSN = +4m.10s., N = +4m.19s., E = +4m.32s. Rocca di Papa (ii) eSN = +3m.51s. Belgrade (i) SR₁ = +4m.19s., L = +7·4m. Zagreb (i) MNW = +8·2m. Zagreb (ii) MNW = +6·6m. Strasbourg (i) e = +8m.40s. Strasbourg (ii) reading has been diminished by 1h. Tifis (i) ($\Delta = 19^\circ \cdot 7$) gives e = 10h.26m.42s.

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June 29d. 20h. 54m. 50s. Epicentre 18°-8N. 120°-0E.

A = -·473, B = +·820, C = +·322 ; D = +·866, E = +·500 ;
G = -·161, H = +·279, K = -·947.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	4·3	167	e 1 5	- 2	—	—	2·4	2·6
Hong Kong	6·5	304	1 41	+ 2	.3 0	+ 3	3·5	4·7
Zi-ka-wei	Z. 12·5	6	3 5	- 1	—	—	—	8·8
De Bilt	E. 89·4	326	—	—	—	—	e 46·2	57·6
	N. 89·4	326	—	—	—	—	e 45·2	48·3
Uccle	90·5	325	—	—	—	—	e 44·2	—

Manila gives also MN = +2·5m.

June 29d. Readings also at 7h. (Manila), 8h. (Belgrade and near Athens), 10h. (near Belgrade (2) and near Granada), 14h. (near Tacubaya), 16h. (La Paz), 22h. (near Algiers).

June 30d. Readings at 5h. (Colombo), 7h. (Taihoku), 13h. (near Mizusawa), 16h. (Tiflis, Zagreb, and near Florence and Rocca di Papa), 18h. (near La Paz), 19h. (La Paz and Rio Tinto), 20h. (near Algiers), 21h. (Tiflis), 22h. (Rio Tinto).

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Diurnal Period in Italian Earthquakes.

Mr. R. D. Oldham, F.R.S., allows us to print the results of his harmonic analysis of the summary of 10 years' Italian earthquakes, 1911-1920, together with similar results for two previous decades, as follows :—

1891-1900	$1.00 + .25 \sin(t + 63^\circ) + .14 \sin(2t + 14^\circ)$
1901-1910	$1.00 + .29 \sin(t + 58^\circ) + .12 \sin(2t + 19^\circ)$
1911-1920	$1.00 + .27 \sin(t + 37^\circ) + .15 \sin(2t + 17^\circ)$

The advance of 26° in the maximum for the first harmonic is noteworthy.

Belated Readings.

WELLINGTON, N.Z.

The following readings were received too late for insertion in the text :—

Date.	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
d. h. m.	°	°	m. s.	s.	m. s.	s.	m.	m.
Apr. 25 21 19	29.1	167	—	—	e 11 6	-13	(i 14.6)	15.2
Apr. 25 21 39	29.1	167	—	—	—	—	14.5	15.0
Apr. 26 1 11	82.9	154	—	—	e 28 53	?SR ₁	e 39.3	42.1
Apr. 26 3 59	88.7	164	—	—	e 24 6	+ 6	e 44.7	45.0
Apr. 28 6 38	2.8	264	-0 6	-50	—	—	i 1.9	4.4
May 1 10 51	79.4	156	—	—	—	—	e 64.6	65.8
May 11 9 14	19.7	169	—	—	i 8 17	0	9.3	10.3
May 12 18 39	19.7	169	e 4 40	+ 3	i 8 22	+ 5	9.2	10.5
June 2 20 11	65.3	143	—	—	e 19 55	+26	e 32.2	37.4

Readings also on April 26d. at 5h., 6h., 11h., 12h., and 16h. (2); on May 28d. 0h. and 4h.; and on June 9d. 20h.

The only case calling for special remark is that of April 28d. 6h. 38m., where the information is generally rough, and the Wellington observation of P (unless it is in error by 1m.) suggests that T₀ should be sensibly earlier. But it seems clear that the observations cannot be all correct, though by no means clear which of them is in error.

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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