The International Seismological Summary for 1921 April, May, June.

FORMERLY THE BULLETIN OF THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

The present number of the Summary deals with 65 epicentres, 29 of which are new and 36 repetitions from old epicentres. The corresponding figures for former periods are :

	New	Old
1913-1920 March	597	550
1920 April—June	27	48
July—Sept.	31	49
Nov.—Dec.	27	42
1921 Jan.—Mar.	31	30
Apr.—June	29	36

The number of new epicentres is thus remarkably steady.

There are only two cases of presumed abnormal focal depth :

April 25d.17h. 22°·0S. 180°·0 Depth +·040
May 20d. 0h. 35°·0N. 69°·0E. Depth +·030

to which may be added a suspected case of *high* focus on May 20d.13h., where, however, the material is not sufficient to establish the point.

The epicentre of 1921 April 25d.17h. was adopted on 1917 May 24d. 19h. 20m. 30s. with the note "the hypocentric stations suggest a deep focus, but the epicentric material is scarcely good enough to warrant refinement." For 1917 May 24 we have records from 27 stations ; and for 1921 April 25d. from 38 stations. It might be supposed that there would be a sufficient number of cases where either P or S could be directly compared to give a definite answer to the question of identity. But there are only the following :—

Δ		1917 May 24 m. s.	1921 April 25 m. s.	Diff. s.
°				
68·5	Manila P	+11 10	+11 1	+ 9
72·1	Batavia P	+10 59	+10 51	+ 8
151·0	Uccle [P]	+19 24	+19 26	− 2
158·2	Paris [P]	+18 32	+19 33	−61
157·6	Rocca [P]	+18 56	+19 45	−49

This evidence is suggestive, but far from conclusive. Similarly the epicentre of 1921 May 20d. (49 stations) was used on 1920 Feb. 27 (25 stations): but the cases available for direct comparison are limited to the following:—

	Δ	Az.	P.	S.		Δ	Az.	S.
	°	°	s.	s.		°	°	s.
Calcutta	21·0	122	+22	+34	De Bilt	47·6	312	+ 6
Pompeii	42·7	296	− 3	—	Uccle	48·2	310	− 9
Strasbourg	46·3	307	+20	—	Coimbra	59·6	300	+25
Moncalieri	46·8	302	+76	+131				

Such instances show how far we are still from having satisfactorily complete readings for direct comparison of one shock with another, suspected of being from the same epicentre. The accuracy of the records is improving considerably, especially since the institution of wireless time-signals: but it still leaves much to be desired.

Those observers who have not already communicated their readings for 1921 and 1922 are urgently requested to send them without delay to the University Observatory, Oxford.

H. H. TURNER.

University Observatory, Oxford.
1925 June 10.

1921 APRIL, MAY, & JUNE.

1921. April 1d. 4h. 6m. 40s. Epicentre **2°·4N. 98°·8E.**
(suggested by Batavia).

A = −·153, B = +·987, C = +·042; D = +·988, E = +·153;
G = −·006, H = +·041, K = −·999.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia		11·8	137	i 2 49	− 7	e 5 15	+ 1	i 6·4	7·2
Colombo		19·4	284	5 20	+46	8 20?	+10	10·3	13·3
Calcutta	E.	22·5	334	5 14	+ 3	(9 38)	+23	9·6	15·0
Kodaikanal		22·6	291	4 50	−22	(8 56)	−21	8·9	12·5
Manila		25·0	60	e 5 34	− 4	10 4	+ 1	12·1	14·0
Bombay		30·2	307	6 18	−12	11 19	−18	—	18·7
Taihoku		31·5	42	—	—	e 11 39	−21	19·2	23·5
Dehra Dun		34·2	328	10 50	?	—	—	—	—
Zi-ka-wei		35·8	35	e 8 33	+73	e 12 53	−14	e 14·4	21·1
Nagasaki		42·0	40	e 18 0	?SR_1	—	—	22·4	—
Hukuoka		42·9	40	10 18	?PR_1	—	—	20·8	23·7
Jinsen		43·3	34	8 1	−19	17 23	?SR_1	—	25·4
Kobe	E.	46·7	43	9 6	+21	—	—	24·2	29·2
	N.	46·7	43	8 53	+ 8	—	—	24·2	26·7
Osaka		46·9	43	9 37	+51	19 7	?SR_1	27·1	31·4
Tokyo		50·4	44	e 8 19	−50	20 5	?SR_1	30·1	35·6
Adelaide		52·8	139	—	—	i 20 26	?SR_1	e 24·1	36·0
Mizusawa	E.	53·1	41	9 21	− 6	16 19	−38	—	—
	N.	53·1	41	9 56	−31	16 46	−11	—	—
Ootomari		58·4	35	26 6	?L	29 28	?	32·7	34·8
Melbourne		58·6	139	e 17 20	?S	(e 17 20)	−46	e 30·3	40·0
Riverview		61·2	133	—	—	e 18 29	− 9	e 26·5	30·0
Sydney		61·2	133	23 20	?	30 2	?L	40·2	41·4
Helwan	E.	69·3	301	10 50	−23	—	—	—	41·2
	N.	69·3	301	16 38	?PR_1	—	—	—	39·5
Athens		76·8	310	e 11 51	− 9	22 39	+52	e 40·3	—
Lemberg		78·4	321	e 21 56	?S	(e 21 56)	− 9	e 38·7	69·5
Wellington		81·1	134	—	—	e 22 32	− 4	e 40·3	47·3
Budapest		81·3	319	e 12 46	+19	e 23 8	+30	e 41·3	53·3
Vienna		83·1	320	i 12 30	− 7	22 49	− 9	e 40·3	72·1
Cape Town		83·3	236	—	—	—	—	—	53·3
Pompeii		84·1	311	12 36	− 7	22 36	−33	—	—
Pola		84·7	316	e 12 18	−28	e 22 46	−30	e 38·3	—
Rocca di Papa		85·5	313	12 40	−11	i 23 7	−18	e 43·4	70·7
Padova		86·1	317	12 54	0	23 26	− 5	—	74·7
Florence		86·6	315	23 20	?S	(23 20)	−17	36·2	53·3
Hamburg		87·4	324	e 13 16	+15	e 23 28	−17	e 40·3	56·5
Zurich		88·4	318	e 12 57	−10	e 23 23	−33	—	—
Strasbourg		88·9	319	e 12 46	−24	e 23 34	−28	e 36·3	61·0
Moncalieri		89·0	315	12 28	−42	23 37	−26	36·6	51·9
Besançon		90·2	318	—	—	23 45?	−31	37·3	—
De Bilt		90·3	322	13 14	− 4	23 44	−33	e 43·3	58·2
Marseilles		90·9	314	—	—	e 23 40	−43	e 37·3	—
Uccle		90·9	321	e 13 10	−11	24 1	−22	37·3	49·1
Paris		92·3	320	e 13 15	−14	e 23 53	−45	38·3	65·3
Algiers		93·1	309	e 13 3	−30	23 47	−59	e 52·3	55·8
Barcelona		93·4	313	—	—	e 24 28	−21	e 49·0	72·1
Kew		93·7	322	—	—	—	—	—	64·3
Dyce		93·8	329	—	—	24 50	− 4	47·3	53·3
Oxford		94·4	322	i 13 28	−12	23 58	−62	46·7	61·3
Stonyhurst		94·6	324	e 18 50	?PR_1	—	—	—	63·3
Edinburgh		94·6	326	—	—	24 20	−42	50·3	61·4
Eskdalemuir		94·8	326	—	—	i 24 56	− 8	39·0	57·9
Tortosa		95·1	312	13 40	− 4	24 12	−55	38·5	82·5
Granada		98·4	309	e 18 29	?PR_1	(e 26 32)	+52	e 26·5	—
San Fernando		100·6	309	17 8	?	—	—	—	62·3

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria		117·4	30	—	—	43 28	?SR_1	53·3	65·6
Ottawa		132·0	354	i 22 47	?PR_1	e 38 58	?SR_1	63·3	—
Toronto		133·9	359	—	—	—	—	72·8	89·7
Ithaca		135·0	355	—	—	61 20	?	e 72·3	—
Ann Arbor	E.	135·2	2	—	—	—	—	71·2	—
Chicago		135·4	6	i 22 50	?PR_1	33 28	?	71·3	—
Harvard	E.	134·3	350	—	—	e 46 48	?SR_1	e 62·7	71·5
Washington		138·5	355	—	—	—	—	68·3	—
Georgetown		138·5	355	—	—	e 46 20	?SR_1	e 61·8	—
La Paz		160·9	221	e 20 8	[− 1]	34 20	?	74·6	109·6

Additional readings: Batavia gives also eL = +14·7m. Manila MN = +12·3m. Taihoku, the S is given as e, also s = +14m.39s. Zi-ka-wei MN = +21·2m. Adelaide e = +15m.44s., i = +28m.2s., and +28m.59s., e = +32m.14s. Melbourne eS = +23m.50s. Riverview eP? = 4h.6m.30s., MZ = +41·3m. Athens iN = +22m.43s. Wellington e = +27m.32s. and +35m.14s. Vienna iPZ = +12m.26s., iNE = +23m.2s. MN = +61·3m. Padova PR_1 = +14m.47s., SR_1 = +25m.8s. Hamburg MN = +46·3m., MZ = +56·7m. Strasbourg MN = +52·6m. De Bilt eN = +23m.57s., MN = +56·8m. Paris MN = +47·3m. Oxford i = +17m.19s. Eskdalemuir iN = +25m.36s. Granada eP = 4h.6m.30s. San Fernando MN = +61·5m. Ottawa eLE = +54·8m., LN = +65·3m. Toronto e = +61m.32s. and +69m.44s., eL = +76·9m., 83·8m., and +88·7m. Chicago eL = +53.3m. Harvard L = +67·3m. and +80·3m. Washington L = +74·3m. La Paz iPV = +20m.14s., L = +71·5m., T_0 = 4h.7m.42s.

1921. April 1d. 12h. 0m. 24s. Epicentre 11°·7S. 166°·3E.

(as on 1920 May 20d.).

A = −·952, B = +·232, C = −·203; D = +·237, E = +·972; G = +·197, H = −·048, K = −·979.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		21·5	98	5 22	+23	10 12	?L	(10·2)	12·6
Riverview		26·1	209	e 5 49	0	e 10 1	−23	e 11·1	13·6
Wellington		30·5	167	e 4 6	?	e 11 54	+11	14·6	16·9
Melbourne		32·3	211	e 6 30	−21	11 42	−31	14·1	20·6
Honolulu	E.	48·2	47	—	—	e 15 59	+ 3	19·9	25·0
	N.	48·2	47	—	—	e 15 51	− 5	19·8	24·3
Manila		52·1	300	e 9 14	− 7	(e 16 34)	−11	—	—
Tokyo		53·6	332	9 20	−10	i 14 55	−129	23·8	29·8
Osaka		54·9	329	9 43	+ 5	17 15	− 5	24·4	26·9
Kobe		55·3	329	9 30	−11	17 5	−20	20·2	—
Mizusawa	E.	56·0	340	9 35	−11	17 11	−23	—	—
	N.	56·0	340	9 38	− 8	17 14	−20	—	—
Taihoku		57·0	310	—	—	e 17 39	− 7	—	—
Batavia		58·9	270	e 10 5	+ 1	—	—	—	—
Zi-ka-wei		60·8	318	e 10 16	− 2	—	—	—	—
Berkeley		83·0	49	—	—	—	—	e 38·6	—
Lick		83·4	49	—	—	—	—	e 38·6	—
Calcutta		83·6	295	12 12	−28	—	—	—	—
Victoria		86·2	39	—	—	(23 30)	− 2	23·5	45·6
Chicago		109·7	50	18 54	?PR_1	28 36	+71	e 48·6	—
Ann Arbor		112·6	49	—	—	—	—	58·3	—
Toronto		115·6	46	—	—	—	—	e 67·1	70·3
Ottawa		117·8	43	—	—	e 56 36	?	e 60·6	—
Washington		117·9	51	—	—	—	—	e 63·6	—
Georgetown		117·9	51	—	—	—	—	65·6	—
La Paz		119·2	117	19 16	[+26]	i 33 29	?	56·6	61·2
Harvard	E.	121·7	47	—	—	—	—	e 62·0	—
Hamburg		134·1	341	e 21 52	?PR_1	—	—	e 63·6	74·6
Helwan	E.	134·5	301	21 36	?PR_1	(28 36)	?	—	—
Budapest		134·9	330	e 17 36	?	—	—	—	—
Eskdalemuir	N.	135·6	352	e 21 49	?PR_1	—	—	60·6	—
Vienna		135·7	333	i 19 33	[+ 2]	—	—	e 63·6	79·8
De Bilt		136·8	343	—	—	—	—	e 65·6	82·8
Uccle		138·2	343	e 22 17	?PR_1	e 32 38	?	e 61·6	75·2

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	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Oxford	138·7	349	23 41	?PR$_1$	—	—	60·6	79·0
Kew	138·8	349	—	—	—	—	—	82·6
Strasbourg	139·0	338	e 19 39	[+ 1]	—	—	e 69·6	89·1
Padova	139·9	332	20 58	?	—	—	—	—
Paris	140·5	345	19 45	[+ 5]	e 33 0	?	66·6	88·6
Besançon	140·8	338	22 36	?PR$_1$	—	—	69·6	—
Florence	141·4	331	—	—	—	—	59·6	—
Pompeii	141·8	325	20 52	?	—	—	—	—
Moncalieri	142·0	337	19 44	[+ 1]	35 12	?	63·5	—
Rocca di Papa	142·1	329	i 19 47	[+ 4]	i 22 46	?PR$_1$	79·6	—
Marseilles	144·4	336	—	—	—	—	74·6	—
Tortosa	148·3	340	19 54	[+ 1]	29 36	?	e 48·6	80·8
Algiers	150·7	332	20 3	[+ 6]	—	—	92·6	—
Coimbra	151·1	352	—	—	—	—	e 72·4	—
Rio Tinto	153·2	347	38 36	?	—	—	—	168·6

Additional readings: Apia gives also L = +11·6m. Riverview MZ = +16·7m. Manila records two eP's, which correspond to P and S. Kobe LN = +21·4m. Ann Arbor LN = +58·0m. (Wiechert) L = +58·5m. Toronto e = +52m.48s. and +60m.36s., L = +62·7m., eL = +87·2m. Ottawa L = +65·1m. Georgetown LN = +69·6m. Harvard e? = +43m.0s., eE = +54m.21s., L = +64·6m. Hamburg MN = +79·6m. Helwan gives its readings as PE and PN respectively. Eskdalemuir iN = +23m.6s. and +28m.59s., LN = +39·6m. Vienna iZ = +22m.4s. (?PR$_1$). De Bilt ePR$_1$ = +22m.15s., MN = +72·5m. Uccle iP = +22m.21s., MN = +84·7m. Strasbourg MN = +89·0m. Padova PR$_1$ = +24m.56s., +25m.51s. Paris PR$_1$ = +22m.37s., MN = +70·6m. Rocca di Papa L = +107·2m.

April 1d. Readings also at 2h. (Lick), 4h. (near Moncalieri), 6h. (near Rocca di Papa, Mostar, and Sarajevo), 7h. (near Rocca di Papa), 16h. (Helwan), 17h. (Eskdalemuir), 20h. (Rio Tinto and Rocca di Papa), 22h. (near Vera Cruz).

1921. April 2d. 9h. 36m. 45s. Epicentre 23°·3N. 122°·0E.

(as on 1919 Oct. 15d.).

A = −·487, B = +·779, C = +·396; D = +·848, E = +·530;
G = −·209, H = +·335, K = −·918.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		1·8	345	1 9	?S	(1 9)	+18	2·1	3·0
Hokoto		2·3	276	−e 0 59	?	−e 0 33	?	−0·1	0·0
Zi-ka-wei		7·9	356	2 8	+ 8	e 4 4	?L	(4·1)	7·9
Manila		8·8	186	e 2 18	+ 5	4 21	+23	4·8	8·4
Nagasaki		11·7	34	2 59	+ 4	—	—	6·2	8·7
Kobe	E.	16·1	42	3 31	−22	5 19	−98	9·8	10·7
	N.	16·1	42	3 32	−21	5 20	−97	9·5	10·5
Osaka		16·3	43	3 55	− 1	7 53	+51	10·6	11·0
Tokyo		19·7	47	4 14	−23	6 40	?PR$_1$	7·6	8·2
Tyosi		20·5	48	4 20	−27	(7 53)	−41	7·9	—
Mito		20·6	46	4 22	−26	(7 48)	−48	7·8	10·4
Mizusawa	E.	22·6	41	4 40	−32	8 29	−48	—	—
	N.	22·6	41	4 43	−29	8 30	−47	—	—
Hakodate		24·2	35	e 5 9	−21	9 19	−29	9·3	9·8
Ootomari		28·7	30	5 48	−27	10 25	−47	12·9	17·2
Calcutta	E.	31·0	275	6 51	+13	11 51	0	18·2	21·2
Batavia		33·0	210	6 55	− 1	12 20	− 4	e 26·2	—
Simla		40·4	291	14 51	?S	(14 51)	+38	22·8	24·8
Colombo		43·7	256	10 15	?PR$_1$	19 15	?	30·2	32·2
Kodaikanal		44·4	261	14 45	?S	(14 45)	−22	25·6	37·6
Perth		55·6	187	—	—	18 15	+46	—	—
Adelaide		60·4	166	e 9 27	−48	i 18 33	+ 5	e 28·8	35·0
Riverview		63·5	153	e 10 30	− 5	e 19 1	− 6	e 28·4	29·2
Sydney		63·5	153	18 27	?S	(18 27)	−40	29·0	29·8
Melbourne		64·8	160	e 11 21	+37	e 19 9	−14	28·8	40·0
Honolulu	E.	72·9	74	—	—	29 43	?	e 32·8	46·7

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Lemberg		77·3	320	e 12 3	0	e 22 3	+11	e 40·0	50·4
Helwan		79·2	298	12 33	+19	—	—	—	58·0
Budapest		81·3	319	i 12 51	+24	i 23 15	+37	e 42·2	—
Belgrade		81·5	316	e 12 34	+ 6	e 17 33	?PR_1	e 35·5	57·8
Vienna		82·5	321	i 12 36	+ 3	22 53	+ 1	e 41·4	45·4
Hamburg		83·5	326	i 12 39	0	i 23 8	+ 5	e 40·2	46·4
Pola		85·6	319	e 22 59	?S	(e 22 59)	−27	e 43·2	59·0
Padova		86·6	320	13 7	+10	23 29	− 8	45·4	56·9
De Bilt		86·7	326	e 13 1	+ 4	23 25	−13	40·2	48·9
Dyce		86·9	334	—	—	23 43	+ 3	—	48·1
Pompeii	E.	87·2	314	13 31	+31	23 15	−28	—	—
Strasbourg		87·4	322	12 58	− 3	e 23 47	+ 2	e 41·2	51·0
Victoria		87·7	37	—	—	—	—	41·2	59·4
Florence		87·8	318	—	—	23 15	−35	—	50·2
Uccle		87·8	325	e 13 0	− 4	23 31	−19	e 40·2	47·2
Rocca di Papa		87·9	316	i 13 3	− 1	i 23 53	+ 2	e 48·0	66·2
Edinburgh		88·3	331	16 39	?PR_1	23 58	+ 3	—	60·0
Eskdalemuir		88·6	331	13 1	− 7	23 35	−24	—	54·5
Besançon		89·1	322	13 39	+28	24 5	+ 1	45·2	—
Stonyhurst		89·2	330	16 45	?PR_1	—	—	48·8	55·2
Moncalieri		89·3	320	13 10	− 2	24 6	0	45·2	55·9
Kew		89·8	329	26 15	?SR_1	—	—	—	63·2
Paris		90·0	324	e 13 14	− 2	i 23 43	−31	42·2	48·2
Oxford		90·1	329	i 13 14	− 3	23 41	−34	34·8	52·0
Marseilles		91·7	320	e 13 25	0	e 23 45	−47	e 41·2	51·5
Barcelona		94·7	319	—	—	e 24 52	−11	e 44·8	55·0
Tortosa		95·9	320	13 37	−11	24 20	−55	e 44·2	63·0
Algiers		96·8	315	e 13 17	−36	24 21	−63	50·2	62·9
Granada		100·8	319	18 50	?PR_1	28 37	+154	—	—
Coimbra		101·4	324	18 5	?PR	28 5	+116	48·1	56·0
Rio Tinto		102·2	321	—	—	25 15	−62	—	62·2
San Fernando	E.	102·8	320	—	—	27 33	+71	—	62·6
Ottawa		109·4	12	—	—	e 28 28	+65	e 48·2	—
Chicago		109·4	23	28 20	?S	(28 20)	+57	53·2	—
Toronto		110·2	15	—	—	—	—	i 62·4	71·4
Ann Arbor		110·2	19	—	—	(28 27)	+57	28·4	—
Harvard		113·1	10	—	—	e 28 15	+20	e 55·4	59·2
Georgetown		115·3	15	—	—	—	—	61·2	—
La Paz		168·3	57	i 20 17	[+ 3]	34 30	?	81·2	86·6

Additional readings: Zi-ka-wei gives also MN = +7·8m. Manila MN = +8·6m. Tokyo MN = +8·6m. Batavia i = +8m.32s., T_o = 9h.36m.37s. Adelaide i = +20m.39s., +21m.15s., and +22m.15s., e = +24m.27s. and +33m.45s. Riverview eS = +19m.15s., MN = +35·0m. Helwan MN = +51·8m. Vienna MZ = +63·6m. Hamburg MN = +47·2m., MZ = +54·2m. Pola MN = +49·5m. Padova PR_1 = +14m.45s., +17m.35s., SR_1 = +24m.13s. De Bilt MN = +49·1m.; epicentre 22°·6N. 123°·4E. Strasbourg MZ = +57·7m. Uccle PR_1 = +16m.26s., SR_1 = +29m.45s., SR_2 = +34m.27s., MN = +49·6m. Rocca di Papa P = +16m.43s. Paris PR_1 = +16m.55s., i = +25m.24s. Oxford PR_1 = +16m.50s. Barcelona MN = +52·7m. Algiers PR_1 = +17m.44s., MN = +68·8m. Coimbra eLE = +38·0m., eLN = +38·1m., MN = +56·1m., T_o = 9h.42m.48s. San Fernando MN = +70·0m. Chicago S? = +34m.9s., eL = +48·2m. Toronto iE = +47m.39s., eL = +74·2m. Harvard L = +57·8m.

April 2d. Readings also at 2h. (Berkeley, Zi-ka-wei, and near Taihoku), 3h. (De Bilt), 5h. (Vienna), 14h. (Barcelona), 22h. (La Paz), 23h. (La Paz, Helwan, and near Tokyo).

April 3d. Readings at 2h. (Honolulu, Georgetown, and Harvard), 3h. (De Bilt, Toronto, and La Paz), 4h. (Victoria), 5h. (Taihoku), 6h. (Helwan and near Algiers), 7h. and 16h. (La Paz), 18h. (Helwan).

April 4d. Readings at 9h. (near Tokyo), 10h. (Apia), 11h. (Riverview), 18h. (Harvard).

April 5d. 17h. 40m. 16s. Epicentre 44°·0N. 13°·0E. (as on 1918 Feb. 8d.).

$A = +\cdot701$, $B = +\cdot162$, $C = +\cdot695$.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Florence	1·3	0 25	+ 5	—	—	—	0·6
Padova	1·6	0 38	+14	—	—	—	5·1
Rocca di Papa	2·2	i 0 35	+ 1	i 1 0	0	—	1·1
Pompeii	3·4	1 40	?L	—	—	(1·7)	—
Moncalieri	3·9	—	—	—	—	e 2·3	—
Vienna	4·8	e 2 44	?L	—	—	(e 2·7)	—

Additional readings: Florence reading given for 18h. Padova gives also $PR_1 = +5$m.4s. Rocca di Papa iP = +0m.38s. Pompeii S = +2m.0s.

April 5d. Readings also at 0h. (Ann Arbor, Chicago, Ottawa, Washington, and near Tucson), 6h. (near Athens), 7h. (Taihoku), 8h. (Colombo), 10h. and 13h. (Helwan), 14h. (La Paz), 15h. (near Athens), 18h. (Harvard), 19h. (near Athens), 20h. (Helwan).

April 6d. Readings at 1h. (Manila), 4h. (Riverview), 8h. (La Paz), 9h. (near Athens), 12h. (Manila, La Paz, and near Athens), 13h. (Helwan and Taihoku), 14h., 16h., and 19h. (La Paz), 20h. (Vienna), 22h. (Helwan (2)).

April 7d. Readings at 5h. (near Algiers), 8h. (La Paz), 9h. (Rocca di Papa), 13h. (near Tokyo), 14h. (near Nagasaki (3)), 18h. (Harvard and La Paz), 19h. (Riverview and Algiers), 20h. (Helwan).

April 8d. Readings at 2h. (La Paz), 4h. (near Mizusawa and Tokyo), 5h. (Uccle and De Bilt), 14h. (near Mizusawa).

April 9d. Readings at 0h. (Helwan), 4h. (near Athens), 15h. (near Tacubaya), 19h. (Lick).

April 10d. 13h. 40m. 10s. Epicentre 53°·2N. 133°·7W.

$A = -\cdot414$, $B = -\cdot433$, $C = +\cdot801$; $D = -\cdot723$, $E = +\cdot691$; $G = -\cdot553$, $H = -\cdot579$, $K = -\cdot599$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		3·9	347	e 1 2	+ 1	e 1 37	−10	e 2·1	2·8
Victoria		8·1	122	2 58	+55	—	—	—	6·4
	Z.	8·1	122	3 50	?S	(3 50)	+10	—	5·3
Berkeley	E.	17·2	148	e 4 22	+15	e 7 12	−10	—	13·1
	N.	17·2	148	e 4 25	+18	e 7 15	− 7	—	13·8
Lick		17·9	147	—	—	(e 7 48)	+10	e 7·8	—
Chicago		32·5	91	6 45	− 8	12 55	+39	17·8	—
St. Louis	N.	32·9	98	e 16 20	?L	17 50	?	18·6	—
Ann Arbor	N.	34·5	88	8 38	+89	14 56	+128	19·9	21·1
Toronto		36·3	83	—	—	e 16 2	?SR_1	19·7	20·4
Honolulu	E.	36·9	220	—	—	e 13 19	− 3	16·6	18·9
	N.	36·9	220	—	—	e 13 22	0	17·1	20·6
Ottawa		37·6	78	7 20	−15	13 13	−19	e 17·7	—
Ithaca		38·6	82	—	—	e 13 28	−21	e 19·2	—
Northfield		40·1	77	—	—	e 18 50	?L	20·8	—
Georgetown		40·6	88	e 7 0	−60	13 44	−31	e 16·9	25·4
Washington		40·6	88	—	—	e 16 50	+155	e 20·8	—
Cheltenham	E.	40·8	88	—	—	e 19 15	?L	25·1	25·6
	N.	40·8	88	—	—	e 21 34	?L	24·7	25·1
Fordham		41·3	83	—	—	i 21 52	?L	24·5	—
Tacubaya	E.	43·0	129	8 16	− 2	15 26	+38	23·4	27·7
Dyce	N.	62·7	27	—	—	—	—	33·8	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Edinburgh		63·6	30	e 10 40	+ 4	19 17	+ 9	30·8	40·4
Eskdalemuir		64·1	30	10 50	+11	—	—	—	—
Oxford		67·6	30	12 6	+64	20 26	+29	—	43·7
Kew		68·4	29	—	—	—	—	—	37·8
Hamburg		69·1	21	e 11 14	+ 2	—	—	e 40·8	—
De Bilt	E.	69·2	25	—	—	—	—	e 32·8	37·5
	N.	69·2	25	11 14	+ 2	20 29	+13	e 33·8	44·3
Uccle		70·2	26	e 11 19	+ 1	e 20 37	+ 9	e 32·8	39·8
Paris		71·5	29	11 27	0	20 54	+10	34·8	37·8
Strasbourg		73·1	25	e 11 34	− 3	21 14	+11	33·8	48·1
Moncalieri		76·4	27	e 9 48	?	21 48	+ 6	30·6	—
Barcelona		78·0	31	—	—	(e 21 39)	−21	e 21·6	—
Tortosa		78·1	33	12 6	− 2	22 5	+ 4	e 33·8	51·8
Rocca di Papa		80·8	25	i 12 23	− 1	i 22 38	+ 5	50·8	—
Algiers		82·6	32	e 12 40	+ 6	23 2	+ 9	41·8	47·3
Manila		87·2	290	21 50	?	—	—	—	—
La Paz		89·4	119	13 14	+ 2	23 58	− 9	45·3	53·2
Helwan		96·0	14	38 50	?	(23 50)	−86	—	—

Additional readings: Ann Arbor gives also LE = +19·8m. (B.O. and W.), ME = +21·8m. Georgetown LEN = +22·0m., MN = +25·2m. Cheltenham iN = +21m.58s. Uccle SR_1 = +25m.9s.

April 10d. Readings also at 1h. (La Paz), 3h. (Batavia), 13h. (St. Louis), 16h. (Dyce), 17h. (near Mizusawa), 19h. (Helwan), 23h. (Ottawa).

April 11d. Readings at 0h. (near Tacubaya), 5h. (Hamburg and De Bilt), 8h. (Helwan), 10h. (Zi-ka-wei), 11h. (De Bilt), 12h. (Helwan, De Bilt, and near Tokyo and Mizusawa), 13h. (La Paz), 19h. (Rio Tinto and Helwan), 23h. (Taihoku).

April 12d. 7h. 29m. 10s. Epicentre 53°·2N. 133°·7W. (as on April 10d.).

A = −·414, B = −·433, C = +·801; D = −·723, E = +·691; G = −·553, H = −·579, K = −·599.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	E.	3·9	347	—	—	(1 40)	− 7	1·7	2·5
	N.	3·9	347	—	—	(1 50)	+ 3	1·8	2·7
Victoria		8·1	122	3 5	+62	—	—	—	4·6
Berkeley		17·2	148	e 4 0	− 7	e 7 8	−14	—	—
Lick		17·9	147	e 5 50	?	—	—	—	—
Tucson	E.	26·6	133	—	—	—	—	e 15·0	—
Chicago		32·5	91	11 25	?S	(11 25)	−51	17·3	—
St. Louis		32·9	98	16 50	?L	18 8	?	19·2	20·7
Ann Arbor	E.	34·5	88	—	—	—	—	23·4	—
Toronto		36·3	83	—	—	—	—	i 19·4	19·8
Honolulu	E.	36·9	220	—	—	—	—	16·5	23·0
	N.	36·9	220	—	—	—	—	e 16·8	22·5
Ottawa		37·6	78	i 19 20	?L	—	—	e 19·8	—
Ithaca		38·8	82	—	—	—	—	e 17·0	—
Northfield		40·1	77	—	—	—	—	e 19·4	—
Georgetown		40·6	88	—	—	—	—	e 18·8	—
Washington		40·6	88	10 44	?	—	—	20·8	—
Cheltenham	E.	40·8	88	—	—	—	—	e 21·4	23·5
	N.	40·8	88	—	—	—	—	e 20·9	23·4
Edinburgh		63·6	30	—	—	(e 13 50)	−18	e 18·8	39·8
Oxford		67·6	30	—	—	19 55	− 2	33·2	39·0
De Bilt		69·2	25	e 11 16	+ 4	20 18	+ 2	e 36·8	37·4
Paris		71·5	29	e 11 33	+ 6	20 50	+ 6	38·8	40·8
Vienna		75·5	19	11 42	−10	—	—	e 51·8	—
Rocca di Papa		80·8	25	e 12 15	− 9	e 22 56	+23	—	23·9
La Paz		89·4	119	13 0	−19	—	—	—	—

Additional readings: Chicago gives also S = +15m.38s. Ann Arbor LN = +22·9m. Ithaca e = +19m.50s., L = +20·6m. Toronto iL = +22·1m. Georgetown iE = +26m.50s. Cheltenham eE = +22m.21s. De Bilt MN = +39·7m. Rocca di Papa iPN = +12m.17s.

April 12d. 9h. 36m. 0s. Epicentre 37°·2N. 101°·4E.

$A = -\cdot157$, $B = +\cdot781$, $C = +\cdot605$; $D = +\cdot980$, $E = +\cdot198$; $G = -\cdot120$, $H = +\cdot593$, $K = -\cdot797$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Zi-ka-wei	17·6	104	e 4 14	+ 2	e 7 32	+ 1	—	11·7
Jinsen	19·9	81	4 22	−18	7 57	−24	10·4	—
Simla	20·9	261	—	—	e 8 48	+ 6	—	13·0
Taihoku	21·1	120	—	—	e 8 40	− 6	11·2	—
Osaka	27·6	85	—	—	10 14	−38	—	17·8
Manila	28·6	137	—	—	e 12 34	+84	18·7	—
Colombo	36·1	220	22 0	?L	—	—	(22·0)	27·0
Batavia	43·7	173	e 8 25	+ 1	i 15 1	+ 3	i 25·7	—
Helwan	57·5	284	23 0	?	(19 0)	+67	—	—
Budapest	58·8	310	—	—	—	—	e 31·6	—
Vienna	60·2	312	i 10 15	+ 2	18 2	−24	e 28·0	32·1
Hamburg	61·6	319	e 10 24	+ 1	—	—	e 30·0	37·0
De Bilt	64·9	318	—	—	19 25	+ 1	e 33·0	41·0
Strasbourg	65·2	314	—	—	—	—	e 33·0	39·0
Rocca di Papa	65·4	306	i 10 46	− 1	—	—	—	11·5
Edinburgh	67·1	324	—	—	—	—	e 33·0	37·0
Paris	68·0	316	11 7	+ 3	—	—	34·0	42·0
Oxford	68·5	320	—	—	20 7	− 1	36·1	43·7
La Paz	157·3	333	20 10	[+ 5]	—	—	—	—

Additional readings: Zi-ka-wei MN = +12·6m. Osaka MN = +16·8m. De Bilt MN = +36·4m. Rocca di Papa iPN = +10m.52s.

April 12d. Readings also at 0h. (Helwan), 4h. (La Paz), 5h. (Batavia), 8h. (Oxford), 14h. (near Mizusawa), 17h. and 21h. (La Paz), 23h. (De Bilt).

April 13d. 4h. 54m. 5s. Epicentre 37°·5N. 32°·5E. (as on 1914 Oct. 3d.).

$A = +\cdot669$, $B = +\cdot426$, $C = +\cdot609$; $D = +\cdot537$, $E = -\cdot843$; $G = +\cdot513$, $H = +\cdot327$, $K = -\cdot793$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	E.	6·9	276	e 1 39	− 6	i 2 51	−16	—	3·3
	N.	6·9	276	e 1 37	− 8	i 2 55	−12	3·0	4·0
Helwan		7·7	188	4 55	?L	—	—	(4·9)	—
Rocca di Papa		15·8	292	e 3 53	+ 4	—	—	7·9	11·7
Strasbourg		21·1	310	4 57	+ 3	—	—	—	11·9
Ucole		23·9	313	e 5 31	+ 4	e 9 39	− 3	e 12·5	15·9
De Bilt		24·0	316	—	—	9 47	+ 3	12·9	16·2
Oxford		27·6	312	—	—	i 11 55	+63	—	—

No additional readings.

April 13d. Readings also at 3h. and 20h. (La Paz), 21h. (Batavia).

April 14d. Readings at 0h. (Batavia), 1h. (La Paz), 2h. (Rocca di Papa), 3h. (near Mostar), 9h. (La Paz), 16h. (Riverview and Melbourne), 17h. (near Porto Rico), 18h. (Helwan), 22h. (Lick and near Oaxaca).

April 15d. 21h. 6m. 10s. Epicentre 33°·3S. 173°·7W.

A = −·831, B = −·092, C = −·549 ; D = −·110, E = +·994 ; G = +·546, H = +·060, K = −·836.

The evidence of La Paz and Manila (in opposite azimuths and both requiring a more distant epicentre) is in favour of a high focus ; and this is supported by San Fernando. But there is scarcely sufficient material to justify a definite solution on these lines.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington	12·2	226	e 3 2	0	i 4 20	−64	—	4·8
Riverview	29·2	259	e 6 22	+ 2	e 11 23	+ 3	e 13·4	16·0
Sydney	29·2	259	6 20	0	(11 38)	+18	11·6	12·4
Melbourne	33·7	250	e 6 56	− 6	—	—	—	13·6
Batavia	77·8	271	i 12 36	+30	i 22 55	+57	—	—
Manila	78·5	296	12 50	+40	(22 48)	+42	22·8	—
La Paz	93·4	112	e 15 9	+95	i 25 23	+34	40·3	—
Helwan	158·5	268	34 50	?	—	—	—	—
De Bilt	161·2	2	e 45 50	?	—	—	—	—
Coimbra	166·3	55	—	—	e 33 50	?	e 47·7	—
Algiers	175·5	36	—	—	e 27 0	?	51·3	—

Additional readings : Riverview iP = +6m.26s., iPR_1 = +7m.11s. and +7m.13s. PS = +11m.36s., MN = +14·7m. HelwanPN = +43m.50s. Coimbra eE = +39m.20s. Algiers ? = +28m.2s.

April 15d. Readings also at 19h. (Helwan).

April 16d. Readings at 0h. (Lick), 6h. and 7h. (La Paz), 16h. (Budapest), 17h. (La Paz).

April 17d. Readings at 13h. and 14h. (La Paz), 15h. (Manila), 16h. (La Paz, near Oaxaca, and near Tokyo), 22h. (De Bilt, Capetown, Helwan, Coimbra, Kodaikanal, and Colombo), 23h. (Eskdalemuir).

April 18d. 17h. 59m. 0s. Epicentre 32°·7N. 131°·9E. (as in the Tokyo Bulletin).

A = −·562, B = +·626, C = +·540.

		Δ	P.	O−C.	S.	O−C.	L.	M.
		°	m. s.	s.	m. s.	s.	m.	m.
Hukuoka		1·5	0 21	− 2	—	—	0·7	0·9
Kagosima		1·6	0 18	− 6	—	—	0·6	1·5
Nagasaki		1·7	0 9	−17	—	—	0·4	0·7
Kobe	E.	3·3	1 3	+11	1 24	− 7	1·7	1·8
	N.	3·3	1 3	+11	1 27	− 4	1·8	1·8
Osaka		3·5	1 3	+ 8	—	—	1·8	2·4
Tokyo		7·1	1 50	+ 2	2 16	−57	2·4	2·8
Zi-ka-wei		9·0	e 3 8	+52	—	—	—	—
Mizusawa	E.	9·8	4 42	?S	(4 42)	+19	5·1	—

Osaka gives also MN = +2·2m. Mizusawa reading is increased by 1h.

April 18d. Readings also at 3h. (near Batavia), 7h. (La Paz), 13h. (near Algiers), 18h. (near Athens), 22h. (Florence), 23h. (Lick).

April 19d. Readings at 0h. (Eskdalemuir, De Bilt, Taihoku, Tokyo, Zi-ka-wei, Mizusawa, Hamburg, Ucele, and Helwan), 11h. (near Mizusawa).

April 20d. 16h. 4m. 10s. Epicentre 35°·2N. 33°·3E.

A = +·683, B = +·449, C = +·576; D = +·549, E = −·836;
G = +·482, H = +·316, K = −·817.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helwan	E.	5·6	196	1 14	−13	—	—	—	6·6
	N.	5·6	196	1 38	+11	—	—	—	7·4
Pompeii		15·8	296	4 2	+13	7 10	+ 20	—	—
Lemberg		16·1	338	e 1 20	?	—	—	—	1·8
Rocca di Papa	E.	17·4	298	i 4 14	+ 4	—	—	—	4·5
Vienna		18·1	321	i 4 25	+ 7	—	—	—	8·2
Padova		19·2	308	4 19	−12	8 10	+ 4	—	—
Moncalieri		21·8	304	e 5 6	+ 3	9 0	− 1	15·5	—
Strasbourg		23·1	313	e 5 10	− 8	9 32	+ 5	10·8	—
Besançon		23·6	309	5 27	+ 3	10 50	+74	—	—
Algiers		24·4	283	5 37	+ 5	10 53	+61	—	16·8
Hamburg		24·6	326	e 5 38	+ 4	e 9 56	+ 1	e 15·8	19·1
Uccle		26·1	316	e 5 44	− 5	e 10 19	− 5	e 12·8	—
De Bilt		26·2	319	—	—	e 10 21	− 5	—	—
Paris		26·4	312	e 5 55	+ 3	e 10 32	+ 2	15·8	19·8
Kew		29·0	315	—	—	—	—	—	18·8
Eskdalemuir		32·1	320	—	—	11 50	−20	—	—

Additional readings and notes: Pompeii P has been increased by 8m. Lemberg gives also e = +1m.44s. There appears to be an error somewhere. Rocca di Papa MN = +5·0m. Vienna iPZ = 16h.1m.47s. Padova PR_1 = +6m.52s., SR_1 = +9m.50s. Paris eSN = +10m.21s., MN = +16·8m. Moncalieri and Kew give their readings as at 15h. and have been corrected by +1h. before entering in the table.

April 20d. 18h. 46m. 3s. Epicentre 32°·5N. 48°·0W.

A = +·564, B = −·627, C = +·537; D = −·743, E = −·669;
G = +·360, H = −·399, K = −·843.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Georgetown	24·3	293	—	—	—	—	14·0	—
Ottawa	24·9	309	e 6 27	+50	—	—	e 15·0	—
Toronto	26·9	303	—	—	—	—	14·6	20·0
Ann Arbor	29·7	299	—	—	—	—	19·8	—
Coimbra	32·5	65	e 4 57	−116	e 11 52	−24	14·6	—
Chicago	32·6	297	e 6 57	+ 4	—	—	18·4	—
Eskdalemuir	38·5	41	—	—	13 57	+12	—	—
Edinburgh	38·7	41	—	—	—	—	—	22·0
Oxford	38·8	47	—	—	13 31	−18	18·2	21·4
Paris	40·8	51	—	—	e 14 14	− 4	20·0	21·0
Uccle	42·1	48	e 8 9	− 3	e 14 32	− 4	e 18·0	22·0
De Bilt	42·7	46	—	—	14 49	+ 5	e 20·0	21·6
Strasbourg	44·2	52	e 8 32	+ 5	—	—	18·0	22·0
Moncalieri	44·3	58	e 8 8	−20	14 57	− 9	21·2	—
Hamburg	45·8	45	e 8 45	+ 6	—	—	e 23·0	27·0
Rocca di Papa	48·3	60	—	—	i 15 49	− 9	—	16·6
La Paz	52·6	205	9 24	0	—	—	25·4	29·6
Victoria	57·1	310	—	—	—	—	33·2	36·2
Helwan	66·3	70	29 57	?L	—	—	(30·0)	—
Taihoku	121·6	11	—	—	e 42 52	?	—	—

Additional readings: Toronto gives also eL = +18·0m. De Bilt eLN = +19·0m. Helwan PN = +37m.57s.

April 20d. Readings also at 0h. (Kobe), 6h. (Vienna), 9h. (Mizusawa), 15h. (near Mizusawa), 16h. (Manila, Strasbourg, and near Mizusawa), 17h. (La Paz), 19h. (La Paz and near Mizusawa).

April 21d. Readings at 1h. (Algiers), 8h. (Manila), 11h. (Taihoku (2) and Zi-ka-wei), 12h. (Zi-ka-wei and Taihoku), 13h. (Taihoku), 14h. (La Paz), 16h. (Manila), 17h. (Rio Tinto), 18h. (near Athens).

April 22d. 6h. 21m. 36s. Epicentre 30°·2S. 177°·7W. (as on 1921 Mar. 24d.).

$A = -\cdot 864$, $B = -\cdot 035$, $C = -\cdot 503$; $D = -\cdot 040$, $E = +\cdot 999$; $G = +\cdot 503$, $H = +\cdot 020$, $K = -\cdot 864$.

The epicentric stations would be suited rather better by the solution $T_0 =$ 6h.21m.0s., epicentre 35°·2S. 174°·3W., which was fully worked out. But this gives large positive (P) residuals for the European stations.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington	12·7	206	2 12	−57	(i 5 12)	−25	5·2	6·4
Apia	17·2	20	4 23	+16	8 20	+58	—	13·7
Sydney	26·6	254	5 36	−18	10 24	− 9	12·7	14·9
Riverview	26·6	254	e 5 33	−21	10 30	− 3	e 12·8	16·2
Melbourne	31·7	246	5 24	−80	11 42	−21	16·1	18·8
Adelaide	36·9	256	e 6 24	−65	e 13 0	−22	e 16·6	22·6
Honolulu	54·9	22	—	—	—	—	25·1	28·0
Manila	74·1	298	e 11 38	− 5	—	—	—	—
Batavia	74·3	272	—	—	e 14 17	?PR_1	e 41·4	47·4
Berkeley	85·4	41	—	—	—	—	e 42·4	—
Victoria	92·4	33	—	—	—	—	e 45·3	48·8
La Paz	97·7	114	e 13 47	−11	i 24 18	−75	47·8	54·0
Colombo	104·3	270	44 24	?	—	—	63·4	67·4
Chicago	109·6	53	50 24	?L	—	—	e 59·4	—
Cape Town	114·1	195	64 57	?L	—	—	(65·0)	—
Toronto	115·9	53	—	—	—	—	e 64·3	66·1
Ottawa	118·9	52	—	—	—	—	e 64·2	—
Edinburgh	154·0	7	—	—	—	—	84·4?	88·4
Lemberg	154·4	326	e 19 12	[−49]	—	—	—	24·8
Eskdalemuir	154·6	7	e 25 1	?PR_1	e 44 51	?SR_1	81·8	—
Helwan	154·9	275	30 24	?S	—	—	—	—
Stonyhurst	156·0	7	e 36 6	?	44 30	?	89·5	98·4
Hamburg	156·2	349	e 20 24	[+21]	—	—	e 83·4	111·4
De Bilt	158·0	353	24 18	?PR_1	—	—	e 85·4	97·0
Oxford	158·2	6	—	—	—	—	—	90·4
Budapest	158·5	328	e 39 24	?	—	—	e 92·4	109·4
Kew	158·6	5	103 24	?	—	—	—	126·4
Vienna	159·1	333	e 20 12	[+ 5]	—	—	e 82·4	102·4
Strasbourg	161·2	349	—	—	—	—	92·4	—
Paris	161·4	0	e 20 10	[+ 2]	—	—	88·4	92·4
Moncalieri	164·8	345	20 22	[+10]	33 14	?	45·6	114·2
Rocca di Papa	165·7	327	e 22 12	?	—	—	—	40·8
Coimbra	166·7	38	—	—	e 40 24	?	e 84·4	—
Tortosa	169·3	5	22 24	?	32 24	?	—	—
Rio Tinto	169·4	42	87 24	? L	—	—	(87·4)	105·4
San Fernando N.	170·5	46	—	—	—	—	94·4	108·4
Algiers	173·4	358	—	—	e 33 0	?	47·5	103·1

Additional readings: Wellington gives also e = +3m.12s. and +4m.54s. Apia MN = +14·9m., T_0 = 6h.21m.22s. Epicentre 16°·0S. 167°·0E. Riverview eP = +7m.14s., S is given as Pg, eS = +10m.10s., MN = +14·2m., MZ = +15·2m. Adelaide 1 = +14m.6s. and +15m.24s., e = +20m. Melbourne SR_1 = +13m.54s., SR_2 = +14m.42s. Honolulu eLN = +30·0m. Batavia eL = +59·4m. Toronto eL = +71·9m., L = +77·6m. Ottawa LE = +78·4m. Helwan PN = +36m.54s. De Bilt eE = +39m.1s. and +44m.31s., MN = +95·6m. Coimbra e = +46m.24s., eLN = +88·4m. Rocca di Papa ePN = +21m.24s., ePE = +22m.0s. Algiers MN = +105·1m.

April 22d. 16h. 3m. 45s. Epicentre 43°·0N. 17°·0W.

A = +·699, B = −·214, C = +·682; D = −·292, E = −·956; G = +·652, H = −·199, K = −·731.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Coimbra		7·0	110	i 1 55	+ 9	i 3 4	− 6	4·5	5·0
San Fernando		10·6	125	1 21	?	—	—	—	6·8
Granada		10·8	115	3 0	+ 4	5 1	−13	—	—
Tortosa		13·2	94	3 12	− 4	5 16	−33	6·2	7·2
Oxford		13·7	45	i 3 20	− 2	5 55	− 6	6·2	9·4
Kew		14·1	47	—	—	—	—	—	11·2
Barcelona		14·2	90	3 36	+ 7	5 59	−14	6·4	8·3
Paris		14·7	60	e 3 35	0	e 6 0	−25	7·2	7·2
Eskdalemuir		15·2	31	—	—	—	—	7·2	—
Edinburgh		15·6	30	—	—	—	—	—	8·8
Uccle		16·5	54	e 3 58	− 1	e 7 3	− 4	e 7·8	8·2
Algiers		16·6	105	4 4	+ 4	7 16	+ 7	8·9	10·4
Besançon		16·7	68	5 15?	+74	—	—	—	—
De Bilt	E.	17·4	51	4 11	+ 1	7 33	+ 6	8·4	10·6
	N.	17·4	51	—	—	—	—	8·2	10·2
Moncalieri		17·8	75	e 3 49	−26	7 19	−17	9·5	—
Strasbourg		18·0	64	4 21	+ 4	e 7 43	+ 3	8·2	—
Hamburg		20·7	50	e 4 48	− 1	e 8 42	+ 4	e 10·6	12·2
Rocca di Papa		21·9	83	i 5 4	0	—	—	—	17·0
Vienna		23·7	66	i 5 22	− 3	14 15	?L	(14·2)	—
Helwan		40·4	93	20 15	? L	—	—	(20·2)	—

Additional readings and notes: Coimbra gives also MN = +3·2m., MN = +4·8m. Tortosa readings are given as at 10h. Barcelona LN = +7·4m. Rocca di Papa eSE = +14m.53s. and +17m.1s., iSN = +15m.2s. and +16m.57s. Vienna L = +70·2m. Helwan PN = +17m.15s.

April 22d. 20h. 47m. 0s. Epicentre 30°·2S. 177°·7W. (as at 6h.).

The elements originally adopted were 22d. 20h. 46m. 35s.; and epicentre 35°·2S. 174°·3W. See the corresponding note for the 6h. shock. But this gave for Vienna the large positive residual [+23s.], and it seemed better to follow the solution finally adopted for 6h.

A = −·864, B = −·035, C = −·503; D = −·040, E = +·999; G = +·503, H = +·020, K = −·864.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington	12·7	206	e 3 42	+33	—	—	6·9	8·0
Sydney	26·6	254	7 30	+96	—	—	14·6	17·4
Riverview	26·6	254	e 5 46	− 8	11 2	+29	12·9	15·1
Melbourne	31·7	246	6 36	− 8	11 42	−21	15·4	19·0
Manila	74·1	298	e 11 0	−43	—	—	—	—
Helwan	154·9	275	42 0	?SR_1	—	—	(86·0)	—
Hamburg	156·2	349	—	—	—	—	85·0	—
De Bilt	158·0	353	—	—	e 44 24	?	e 79·0	99·3
Vienna	159·1	335	20 10	[+ 3]	—	—	—	—
Uccle	159·3	355	—	—	—	—	e 78·0	—

Additional readings: Wellington gives also e = +6m.18s., i = +12m.6s. Riverview MN = +17·4m., MZ = +19·7m. Helwan PN = +96m.0s. The SR_1 entered above is given as P of a later shock.

April 22d. Readings also at 8h. and 9h. (La Paz), 10h. (Tortosa), 14h. (Florence), 16h. (near Tacubaya and Oaxaca), 22h. (Melbourne and Uccle).

April 23d. Readings at 6h. (Batavia), 9h. (Rocca di Papa), 18h. (La Paz), 19h. (near Riverview and Adelaide), 20h. (Melbourne and Riverview), 21h. (Strasbourg, Vienna, Riverview, and Melbourne), 22h. (Helwan), 23h. (Manila).

April 24d. **Readings at 1h. (near Mostar and Sarajevo), 12h. (near Tokyo), 16h. (near Osaka and near Tacubaya), 18h. (near Taihoku), 22h. (Manila), 23h. (Melbourne).**

April 25d. **17h. 33m. 43s. Epicentre 22°·0S. 180°·0 (as on 1920 Sept. 8d.).**

$A = -\cdot927$, $B = \cdot000$, $C = -\cdot375$; $D = \cdot000$, $E = +1\cdot000$; $G = +\cdot375$, $H = \cdot000$, $K = -\cdot927$.

A depth 0·040 of focus is assumed (see Note to 1917 May 24d.).

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		−0·6	11·3	45	e 2 29	−11	—	—	5·9	6·8
Wellington		−1·6	19·8	191	e 4 47	+28	—	—	e 9·1	11·1
Christchurch		−1·9	22·4	194	—	—	9 53	+79	11·0	17·7
Riverview		−2·4	28·0	239	e 5 44	0	e 10 14	0	e 12·1	13·4
Sydney		−2·4	28·0	239	7 35	?PR_1	11 29	?SR_1	13·0	16·3
Melbourne		−2·9	34·0	234	7 53	?PR_1	11 41	−12	14·1	20·6
Adelaide		−3·2	38·3	240	e 7 59	+45	i 12 53	− 4	e 16·9	23·6
Honolulu	E.	−3·9	48·4	28	—	—	—	—	18·3	21·6
	N.	−3·9	48·4	28	—	—	—	—	18·6	24·4
Perth		−4·5	57·2	245	17 28	?S	(17 28)	+36	29·5	—
Manila		−4·8	68·5	297	e 11 1	+25	—	—	—	—
Batavia		−4·9	72·1	270	e 10 51	− 8	e 20 3	+11	e 31·3	—
Berkeley		−5·1	80·7	42	—	—	—	—	e 36·3	—
Victoria		−5·3	86·7	34	—	—	—	—	e 35·2	42·7
La Paz		−5·6	102·9	114	e 18 31	?PR_1	—	—	—	—
Kodaikanal		−5·7	105·3	275	61 11	?	—	—	64·0	70·7
Chicago		−5·7	106·2	51	36 52	?SR_1	—	—	52·3	—
Ann Arbor	E.	−5·8	109·1	51	—	—	—	—	73·4	—
Toronto		−5·9	112·5	50	—	—	—	—	59·9	64·1
Ottawa		−6·0	115·4	49	—	—	—	—	e 56·8	—
Cape Town		—	121·4	199	50 55	?L	—	—	(50·9)	—
Edinburgh		—	146·0	3	—	—	—	—	73·3	94·3
Eskdalemuir		—	146·6	4	23 17	?PR_1	—	—	—	—
Hamburg		—	147·5	350	e 19 31	[−21]	—	—	e 69·3	74·3
Stonyhurst		—	148·1	3	71 17	?L	—	—	(71·3)	93·0
De Bilt		—	149·7	354	19 35	[−20]	—	—	e 68·3	83·0
Budapest		—	150·3	334	e 57 17	?	—	—	e 72·3	—
Oxford		—	150·3	2	—	—	—	—	70·4	89·9
Vienna		—	150·7	337	i 19 25	[−32]	—	—	e 70·3	86·3
Helwan		—	150·9	292	30 17	?S	—	—	—	—
Uccle		—	151·0	353	e 19 26	[−31]	—	—	e 67·3	84·3
Belgrade		—	151·7	328	e 19 16	[−42]	e 19 49	?	69·1	—
Strasbourg		—	152·8	349	e 19 31	[−29]	—	—	e 75·3	78·3
Paris		—	153·2	356	e 19 33	[−27]	e 36 18	?	73·3	86·3
Padova		—	154·7	340	19 31	[−31]	20 3	?	—	—
Monselleri		—	156·2	346	e 19 51	[−12]	36 25	?	75·8	—
Rocca di Papa		—	157·6	335	e 19 45	[−21]	—	—	e 79·8	—
Pompeii	E.	—	157·6	330	20 30	[+24]	—	—	—	—
Coimbra		—	160·5	19	—	—	—	—	e 74·3	—

Additional readings and notes: Wellington gives also eP = +1m.53s. Christchurch SR_1 = +10m.17s. All readings for this Observatory are given for 18h. and have been corrected. Riverview iS = +10m.19s., SR_2 = +11m.46s., SR_3 = +11m.58s., MZ = +14·7m. Adelaide i = +15m.47s. and +19m.53s. Perth S = +23m.40s. (?SR). Ann Arbor LN = +73·1m. Toronto eL = +62·6m. and +73·6m. Stonyhurst +80m.5s. and +91m.17s. De Bilt MN = +76·8m. Helwan PN = +36m.17s. Padova SR_1 = +20m.49s. Rocca di Papa eE = +19m.47s. IPM = +19m.59s. Belgrade ePN = +18m.12s.

April 25d. **Readings also at 2h. (Riverview), 7h. (near Kobe, Osaka, Nagasaki, Hukuoka, and Mizusawa), 14h. (near Tacubaya), 23h. (near Athens).**

April 26d. **Readings at 2h. (Uccle), 4h. (Taihoku), 11h. (near Taihoku), 14h. (Helwan), 15h. and 19h. (La Paz).**

April 27d. 2h. 5m. 16s. Epicentre 0°·4S. 20°·0W. (as on 1918 June 3d.).

A = +·940, B = −·342, C = −·007; D = −·342, E = −·940; G = −·007, H = +·002, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Algiers		42·5	27	e 8 15	0	—	—	22·7	38·2
La Paz		50·1	249	e 9 8	0	e 16 18	− 2	23·7	25·2
Paris		52·9	18	e 11 44	?PR$_1$	—	—	25·7	34·7
De Bilt	E.	56·6	18	—	—	18 2	+21	e 24·7	31·3
	N.	56·6	18	—	—	—	—	e 25·7	38·2
Helwan		57·4	53	18 44	?S	(18 44)	+53	(26·7)	—
Edinburgh		57·9	11	—	—	—	—	—	29·7

Additional notes: Algiers gives also ? = +9m.57s., all readings given as at 3h. La Paz iP = +9m.18s., T_o = 2h.5m. 23s.

April 27d. Readings also at 1h. (Melbourne, Wellington, and Riverview), 2h. (Strasbourg), 6h. (La Paz), 9h. (Kodaikanal and near Calcutta), 10h. (De Bilt, Eskdalemuir, Helwan, and Hamburg), 12h. (near Osaka), 13h. (near Tokyo), 17h. (Zurich), 18h. (near Nagasaki), 21h. (La Paz, Ottawa, and San Fernando), 22h. (near Rocca di Papa and Pompeii).

April 28d. Readings at 2h. (La Paz), 3h. (Lick), 4h. (La Paz), 10h. (Paris, Hamburg, Helwan, Osaka, Budapest, Rocca di Papa, Uccle, and De Bilt), 16h. (La Paz and Manila), 19h. (Manila), 20h. (Helwan, La Paz, and De Bilt), 21h. (San Fernando).

April 29d. Readings at 19h. (near Osaka), 22h. (Zurich), 23h. (San Fernando).

April 30d. Readings at 2h. (La Paz and near Athens), 6h. (near Tokyo), 14h. (San Fernando), 15h. (near Zurich and Chur), 17h. (near Zurich).

1921. May 1d. 5h. 38m. 56s. Epicentre 18°·5N. 104°·5W.

(suggested by Ottawa).

A = −·237, B = −·918, C = +·317; D = −·968, E = +·250; G = −·079, H = −·307, K = −·948.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mazatlan		5·1	340	4 44	?	—	—	5·8	6·4
Tacubaya	E.	5·1	80	1 28	+ 9	—	—	2·6	2·7
	Z.	5·1	80	1 26	+ 7	—	—	2·5	3·0
Oaxaca		7·5	100	2 55	+61	—	—	4·6	5·0
Tucson	E.	14·9	338	3 42	+ 4	6 30	0	7·2	8·4
	N.	14·9	338	—	—	e 6 51	+21	e 8·2	9·6
St. Louis	E.	23·6	29	e 5 19	− 5	9 40	+ 4	11·0	15·1
	N.	23·6	29	—	—	9 34	− 2	—	14·9
Lick	E.	24·1	325	e 5 27	− 2	e 10 3	+17	e 11·8	—
	N.	24·1	325	e 5 27	− 2	e 10 5	+19	e 11·7	—
Berkeley	E.	24·9	325	e 5 39	+ 2	e 10 24	+23	e 12·2	16·1
Balboa Heights	E.	26·0	108	7 4	?	—	—	—	—
Chicago		27·3	28	5 50	−11	10 42	− 4	13·7	17·2
Ann Arbor	E.	29·6	32	6 28	+4	11 52	+25	18·1	19·0
	N.	29·6	32	6 4	−20	—	—	18·0	19·0
	E.	29·6	32	6 16	− 8	—	—	18·5	—
	N.	29·6	32	5 52	−32	—	—	18·0	—
Cheltenham	E.	31·3	46	7 23	+42	e 18 14	?	e 20·9	21·4
	N.	31·3	46	—	—	—	—	17·9	20·4
Georgetown	E.	31·3	45	7 22	+41	11 54	− 2	e 20·1	21·1
	N.	31·3	45	7 22	+41	11 52	− 4	e 20·1	22·2
Washington		31·3	45	6 58	+17	11 46	−10	14·4	—
Toronto		32·8	35	—	—	12 52	+31	i 20·9	27·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Saskatoon	N.	33·5	1	6 43	−18	12 15	−17	15·6	—
Victoria		33·6	339	(7 38)	+37	(12 4)	−30	12·1	19·0
	Z.	33·6	339	6 49	−12	—	—	—	22·3
Ithaca		33·7	39	e 7 19	+17	e 11 46	−50	e 17·6	—
Ottawa		35·9	37	7 4	−17	12 50	−19	e 17·3	22·6
Northfield		37·0	39	e 8 34	+64	13 4	−20	e 15·2	—
Halifax	N.	42·9	43	e 8 4	−13	e 14 14	−33	e 21·1	—
Sitka	N.	44·9	338	—	—	—	—	e 25·7	—
La Paz		50·0	133	9 7	0	16 24	+ 5	23·2	29·9
Honolulu	N.	50·2	282	—	—	16 29	+ 8	23·6	25·2
Edinburgh		80·9	34	12 23	− 1	22 36	+ 2	43·1	49·8
Eskdalemuir		81·0	34	i 12 28	+ 3	22 49	+14	39·1	43·2
Stonyhurst		82·0	37	12 34	+ 4	23 28	−18	47·1	49·6
Coimbra		82·6	50	i 12 35	+ 1	23 9	+16	e 37·1	56·2
West Bromwich		82·7	38	12 35	+ 1	23 5	+11	—	—
Oxford		83·4	39	i 12 44	+ 6	23 4	+ 3	40·4	50·3
Kew		84·1	39	23 4	?S	(23 4)	− 5	—	50·1
San Fernando		85·5	52	11 46	−65	22 16	−69	—	53·2
Paris		86·8	40	i 12 56	− 2	e 23 22	−17	49·1	51·1
De Bilt		86·9	35	13 1	+ 3	23 32	− 8	e 51·1	—
Uccle		87·0	37	e 12 54	− 5	e 23 30	−11	e 42·1	52·1
Granada		87·1	51	i 13 1	+ 1	23 35	− 7	—	—
Hamburg		88·7	33	e 13 2	− 7	e 23 36	−24	e 46·1	58·9
Tortosa		88·8	47	13 3	− 6	23 33	−28	37·8	67·6
Barcelona	E.	89·6	45	e 13 3	−11	e 23 37	−33	e 48·8	57·5
	N.	89·6	45	—	—	—	—	e 44·7	54·8
Besançon		89·6	40	—	—	23 46?	−24	52·1	—
Strasbourg		90·0	38	e 13 8	− 8	23 30	−44	e 40·1	54·8
Moncalieri		91·7	41	e 13 15	−10	21 18	−194	39·1	56·9
Algiers		92·3	49	e 13 18	−11	23 53	−45	42·1	56·1
Vienna		95·0	35	i 13 33	−10	24 13	−53	e 48·0	56·1
Pola		95·4	38	—	—	e 23 40	−90	e 53·7	57·7
Wellington		95·4	229	—	—	e 24 4	−66	44·3	47·1
Rocca di Papa		96·4	42	i 13 42	− 9	i 24 22	−58	e 54·1	61·2
Budapest		96·9	34	—	—	e 23 58	−87	e 45·4	56·1
Pompeii	E.	98·1	42	17 4	?PR_1	—	—	59·1	—
Riverview		111·8	240	—	—	e 28 58	+74	e 52·5	62·1
Zi-ka-wei		113·6	319	—	—	—	—	e 64·4	—
Helwan		115·6	41	20 4	?PR_1	—	—	—	—
Melbourne		117·3	236	—	—	29 58	+90	53·0	66·2
Adelaide		122·2	240	—	—	—	—	e 64·8	76·1
Manila		124·3	304	—	—	—	—	e 81·1	89·1
Cape Town		127·2	119	—	—	—	—	—	77·1
Simla		130·4	359	—	—	—	—	e 59·3	—
Kodaikanal		151·2	356	e 13 58	?L	—	—	88·2	92·0
Colombo		154·3	350	95 '4	?L	—	—	(95·1)	99·1

Additional readings: Berkeley gives also MN = +17·1m. Georgetown SR_1 = +17m.48s. Toronto PR_1 = +8m.16s., eL = +23·9m., +62·1m., and +64·1m. Saskatoon PR_1N = +7m.48s., T_e = 5h.38m.40s. Ithaca LE = +21·2m. Ottawa PR_1 = +8m.22s., MN = +19·9m., T_e = 5h.38m.43s., epicentre 18°·5N. 104°·5W., as adopted. Halifax SR_1N = +17m.29s., T_e = 5h.38m.43s. La Paz iPN = +9m.13s., T_e = 5h.38m.54s., epicentre 20°·5N. 102°·0W. Honolulu SR_1N = +20m.28s., SR_1N = +21m.36s. Eskdalemuir MN = +48·4m. Uccle SR_1 = +29m.34s., SR_2 = +33m.22s. Hamburg MN = +53·5m., MZ = +60·1m. Strasbourg MN = +54·1m. Moncalieri MN = +55·1m. Vienna MZ = +56·8m. Pola MN = +56·9m. Wellington e = +29m.4s. and +37m.4s. Riverview MN = +59·4m. Melbourne PR_2 = +25m.4s.?, SR_1 = +36m.40s., PR_2 corrected by −40m.

May 1d. Readings also at 0h. (Taihoku and Manila), 1h. (near Zurich and Chur), 3h. (Florence, Manila, Zi-ka-wei, and near Taihoku), 4h. (De Bilt), 7h. (La Paz), 9h. (Taihoku), 11h. (Taihoku and Manila), 12h. (Fordham), 14h. (Batavia), 16h. and 17h. (2) (Belgrade), 18h. (near Tokyo), 19h. (Manila and near Batavia (3)), 20h. (near Vera Cruz), 21h. (La Paz, Tacubaya, and near Puebla), 23h. (Melbourne).

May 2d. Readings at 7h. (Manila, Taihoku, and Florence), 13h. (La Paz), 16h. (Riverview and Wellington), 19h. (Helwan), 20h. (Belgrade), 21h. (near Oaxaca), 23h. (Mizusawa).

May 3d. 8h. 23m. 12s. Epicentre 43°·5N. 7°·5E. (as on 1919 Nov. 28d.).

$A = +·719$, $B = +·095$, $C = +·688$.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Marseilles	1·6	0 35	+11	0 56	+11	—	—
Besançon	3·9	(1 20)	+19	1 20	−27	—	—
Zurich	3·9	e 0 55	− 6	i 1 35	−12	—	1·8
Strasbourg	5·1	e 1 17	− 2	e 2 12	− 8	e 2·6	—
Paris	6·4	e 1 52	+14	e 2 51	− 4	—	—

Zurich gives iSZ = +1m.36s.

May 3d. 10h. 42m. 50s. Epicentre 15°·0S. 172°·0W. (suggested by Apia).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Apia	1·2	11	0 20	+ 2	(0 38)	+ 5	0·6	—
Riverview	38·1	234	e 8 22	+43	—	—	e 15·8	20·3
Honolulu E.	38·8	21	—	—	—	—	17·8	18·3
Melbourne	44·2	230	—	—	e 14 22	−43	—	24·5
La Paz	98·6	109	—	—	—	—	48·8	—
Eskdalemuir	138·8	10	—	—	—	—	68·2	—
De Bilt E.	142·9	3	—	—	—	—	e 77·2	—
Vienna	146·1	349	19 22	[−28]	—	—	—	—
Paris	146·2	6	e 19 25	[−25]	—	—	78·2	78·2
Strasbourg	146·5	0	e 19 24	[−26]	—	—	—	—
Helwan	153·9	309	97 10	?L	—	—	(97·2)	—

Additional readings and notes: Apia reading given as on 1d. Riverview gives also MN = +20·6m. Honolulu LN = +17·5m., MN = +19·0m. Eskdalemuir reading has been increased by 1h. De Bilt eLN = +72·2m. Helwan PN = +93m.10s.

May 3d. Readings also at 1h. (Moncalieri), 4h. (2), 5h., and 6h. (La Paz), 8h. (Capetown), 15h. (Belgrade), 17h. (Cape Town), 19h. (La Paz).

May 4d. 4h. 53m. 30s. Epicentre 45°·0N. 135°·0E. (as on 1919 May 16d.).

$A = -·500$, $B = +·500$, $C = +·707$; $D = +·707$, $E = +·707$; $G = -·500$, $H = +·500$, $K = -·707$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	10·0	157	e 14 20	?	—	—	—	—
Zi-ka-wei	17·4	222	e 4 10	0	e 7 26	− 1	—	—
Taihoku	22·7	213	—	—	e 9 55	+36	—	—
Manila	32·6	207	—	—	e 11 14	−64	—	—
Batavia	57·1	214	—	—	—	—	e 25·6	—
Hamburg	70·9	329	—	—	—	—	e 33·5	—
Eskdalemuir	73·7	338	—	—	—	—	37·5	—
De Bilt	73·8	330	—	—	—	—	e 36·5	—
Uccle	75·1	330	—	—	—	—	e 35·5	—
Strasbourg	75·8	328	—	—	—	—	e 36·5	—
Kew	76·1	335	—	—	—	—	—	44·5
Oxford	76·2	335	—	—	—	—	—	45·6
Paris	77·4	330	—	—	—	—	e 38·5	47·5
Helwan	78·0	301	37 30	?L	(25 30)	?SR_1	(37·5)	—

Helwan readings are given as PE and PN respectively.

May 4d. 17h. 35m. 48s. Epicentre 48°·0N. 18°·0E.

$A = +·636$, $B = +·207$, $C = +·743$; $D = +·309$, $E = -·951$; $G = +·707$, $H = +·230$, $K = -·669$.

Very doubtful. The material is not at all good.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Budapest	0·9	126	i 0 14	0	—	—	e 1·1	—
Vienna	1·1	283	i 0 10	− 7	—	—	i 0·4	2·8
Belgrade	3·6	150	e 0 45	−11	1 47	+ 8	(1·8)	3·2
Pola	4·3	224	e 1 4	− 3	(e 2 0)	+ 2	e 2·0	2·5
Lemberg	4·4	63	—	—	—	—	e 2·2	2·8
Padova	5·0	240	1 55	+38	3 28	?L	(3·5)	3·6
Zurich	6·4	268	e 1 23	−15	3 23	?L	(3·4)	—
Strasbourg	6·8	279	e 2 43	?S	(e 2 43)	−22	e 3·6	5·4
Rocca di Papa	7·3	213	i 4 0	?L	—	—	(i 4·0)	4·6
Hamburg	7·5	321	—	—	e 3 12	−12	e 4·2	5·3
Moncalieri	7·7	250	e 1 32	−25	2 44	−45	4·0	5·4
Besançon	8·2	271	4 14	?L	—	—	(4·2)	6·2
De Bilt	9·2	301	—	—	—	—	e 4·6	6·1
Uccle	9·3	293	—	—	e 4 18	+ 8	e 4·8	—
Paris	10·3	280	—	—	e 5 16	?L	5·9	6·2
Cape Town	81·9	180	—	—	—	—	—	60·2

Additional readings and notes: Budapest readings have been increased by 2m. Belgrade P = +54s. Vienna gives also iPZ = +0m.5s., ePZ = +0m.4s., MN = +0·7m., MZ = +3·2m. Pola MN = +2·4m. Padova PR_1 = +2m.30s. Strasbourg MN = +4·5m. Rocca di Papa eE = +2m.42s., eN = +4m.12s. Hamburg MZ = +5·6m., MN = +6·3m. De Bilt MN = +5·8m.

May 4d. 21h. 12m. 25s. Epicentre 11°·0S. 176°·0W. (as on 1918 Aug. 1d.).

$A = -·979$, $B = -·068$, $C = -·191$; $D = -·070$, $E = +·997$; $G = +·190$, $H = +·013$, $K = -·982$.

If we accept the Apia observations as exact we must write Δ = 3°·3, T_0 = 21h.13m.7s. This makes Manila and Batavia, in azimuths nearly opposite to that of Apia, also require a diminished Δ; thus, agreeing with the revised observations of [P], viz. [−41s.], [−38s.], and [−38s.] in requiring a deep focus. But the evidence is too slight to justify a definite assumption of this kind.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		5·0	125	1 34	+17	(2 13)	− 4	2·2	—
Honolulu	E.	36·9	28	e 16 45	?	—	—	16·9	17·9
Riverview		37·7	228	—	—	—	—	e 15·6	17·1
Manila		67·4	291	e 19 11	?S	(e 19 11)	−44	—	—
Batavia		76·2	270	—	—	i 21 27	−12	—	21·9
La Paz		103·6	110	17 11	?	—	—	—	—
De Bilt		138·9	359	—	—	e 42 35	?SR_1	—	—
Vienna		141·4	347	i 19 43	[+ 1]	—	—	—	21·7
Paris		142·1	2	e 19 47	[+ 4]	—	—	80·9	—
Strasbourg		142·2	356	e 19 47	[+ 4]	e 20 54	?	e 21·0	—
Helwan	N.	148·3	311	103 35	?	—	—	—	—

Additional readings: Honolulu gives also LN = +17·2m. Riverview e? = +9m.29s. Vienna MZ = +21·0m.

May 4d. Readings also at 16h. (La Paz), 17h. (Helwan and Budapest), 18h. (Vienna, Budapest, and near Athens), 20h. (Helwan).

May 5d. Readings at 3h. (Riverview), 5h. (Batavia), 6h. (Mostar, Sarajevo, and Belgrade), 10h. (Wellington and near Pompeii), 11h. (Helwan and near Pompeii), 18h. (La Paz and near Tokyo), 20h. (Kobe and Helwan).

May 6d. Readings at 2h. (near Algiers), 3h. (Manila), 4h. (Helwan), 7h. and 10h. (La Paz), 14h. (Taihoku and near La Paz), 16h. (Manila).

May 7d. Readings at 2h. (La Paz), 3h. (Helwan), 4h. (near Batavia), 13h. and 22h. (La Paz).

May 8d. Readings at 6h. (La Paz and near Mostar), 11h. (La Paz), 18h. (Manila and near Mizusawa), 21h. (La Paz).

May 9d. Readings at 1h. (near Port au Prince), 4h. (Vienna), 5h. and 9h. (La Paz), 10h. (Apia), 12h. (La Paz), 13h. (Helwan), 16h. (La Paz), 17h. (Helwan), 19h. (Taihoku), 20h. (Manila), 22h. (Manila).

May 10d. 4h. 55m. 50s. Epicentre 41°·0N. 24°·6E. (as on 1919 Oct. 9d.).

$A = +\cdot686$, $B = +\cdot314$, $C = +\cdot656$; $D = +\cdot416$, $E = -\cdot909$; $G = +\cdot596$, $H = +\cdot273$, $K = -\cdot755$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		3·2	192	1 0	+10	1 33	+ 5	e 1·6	2·0
Belgrade		4·9	324	e 1 40	+24	—	—	—	4·3
Sarajevo		5·4	305	e 1 29	+ 6	i 2 28	0	—	3·4
Mostar		5·5	297	i 1 26	+ 1	i 2 13	−18	—	3·7
Pompeii	E.	7·6	272	1 34	−21	3 14	−12	—	3·7
Budapest		7·6	331	e 3 45	?L	—	—	(3·8)	—
Pola		8·7	300	e 2 3	− 9	—	—	e 4·7	5·4
Rocca di Papa	E.	9·0	279	i 1 53	−23	4 10	+ 7	—	4·6
	N.	9·0	279	—	—	4 15	+12	—	5·0
Padova		10·2	300	1 58	−35	9 52	?L	(9·9)	—
Florence		10·2	290	5 10	?L	—	—	(5·2)	7·2
Helwan		12·4	152	8 10	?L	—	—	(8·2)	—
Moncalieri		12·9	293	e 2 28	−44	—	—	6·3	—
Zurich		13·1	305	e 3 21	+ 7	—	—	—	—
Strasbourg		14·1	308	e 3 24	− 3	e 8 7	?L	e 10·1	—
Besançon		14·6	302	3 46?	+12	8 31	?L	(8·5)	10·2
Hamburg		16·0	327	e 4 10	+18	—	—	e 9·5	10·2
Uccle		17·1	312	e 4 10	+ 4	e 7 22	+ 2	e 9·8	—
Algiers		17·2	263	e 3 41	−26	6 28	−54	14·2	—
De Bilt		17·3	316	—	—	e 7 38	+13	9·6	11·6
Paris		17·3	304	e 4 8	− 1	e 7 51	+26	9·8	11·2
Tortosa		18·1	278	e 1 10	?	(e 7 10)	−32	e 7·2	12·5
Oxford		20·7	310	—	—	i 8 32	− 6	—	14·6
Eskdalemuir		23·2	318	—	—	e 9 27	− 2	13·2	—
Edinburgh		23·4	319	—	—	9 10	−23	—	—
Coimbra		24·9	279	—	—	(e 9 26)	−35	e 9·4	—

Additional readings: Belgrade gives also $iP = +2m.26s.$, $iSR_1 = +3m.44s.$ Budapest gives also $e = +5m.3s.$ Pola $MN = +7\cdot1m.$ Rocca di Papa $L = +9\cdot0m.$ Padova $PR_1 = +7m.8s.$ Helwan $PN = +13m.10s.$ Hamburg $MZ = +12\cdot3m.$, $MN = +13\cdot3m.$ De Bilt $MN = +10\cdot8m.$ Coimbra $e = +8m.24s.$

May 10d. Readings also at 1h. (La Paz (2) and Nagasaki), 2h. and 3h. (Helwan), 4h. (Florence and Lemberg), 8h. (near Algiers), 11h. (Helwan), 12h. (Apia and La Paz), 15h. (near Mizusawa), 18h. (near Vera Cruz, Oaxaca, and Tacubaya), 20h. (La Paz).

May 11d. Readings at 0h. (near Vienna), 1h. (near Pompeii and Rocca di Papa), 3h. (La Paz (3) and Apia), 4h. and 6h. (Manila), 9h. (La Paz), 11h. (near Mizusawa), 12h. (near Tokyo, Mito, Tyosi, and Mizusawa), 14h. (near Rocca di Papa), 16h. (Helwan), 18h. (Helwan, Strasbourg, and near Rocca di Papa).

May 12d. 3h.40m.14s. Epicentre 6°·5S. 153°·5E. (as on 1918 Jan. 4d.).

A=−·889, B=+·443, C=−·113; D=+·446, E=+·895; G=+·101, H=−·051, K=−·994.

The antipodal stations suggest an increase of T_0 *or* a high focus. The latter is contradicted by the observations near the epicentre, which suggest rather a deep focus.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview		27·4	184	e 5 54	− 8	e 10 34	−14	e 12·1	15·4
Sydney		27·4	184	10 58	?S	(10 58)	+10	15·2	17·2
Adelaide		31·6	204	e 6 4	−39	i 11 58	− 3	e 14·9	19·6
Apia		34·9	105	—	—	—	—	16·8	—
Manila		38·5	303	e 7 25	−17	—	—	—	21·2
Wellington		39·6	155	7 46	− 5	13 46	−14	18·1	22·8
Perth		43·3	229	8 15	− 5	14 51	− 1	23·9	—
Tokyo		44·1	344	—	—	—	—	e 16·8	—
Taihoku		44·3	317	—	—	e 14 46	−20	—	—
Batavia		46·4	268	e 8 13	−30	i 15 2	−31	e 22·8	—
Zi-ka-wei		48·7	323	e 9 22	+24	—	—	—	—
Honolulu	E.	55·1	58	i 9 31	− 9	i 17 4	−18	25·6	34·2
	N.	55·1	58	—	—	—	—	25·8	34·6
Kodaikanal		78·2	283	54 4	?	—	—	—	—
Berkeley		89·4	52	—	—	e 23 57	−10	—	—
Victoria		90·5	41	23 12	?S	(23 12)	−67	41·7	48·8
Chicago		115·7	45	19 36	?PR_1	29 24	+68	e 46·3	—
Toronto		120·8	42	—	—	—	—	63·8	75·0
Helwan		121·0	301	20 46	?PR_1	(28 46)	−41	—	—
Cape Town		121·4	223	32 1	?	—	—	—	63·0
Ottawa	E.	122·4	39	19 46	[+47]	e 25 26	−221	50·3	—
Budapest		123·6	325	—	—	—	—	e 48·8	61·8
Hamburg		124·5	335	e 21 46	?PR_1	—	—	e 56·8	67·8
Vienna		124·7	327	e 19 18	[+13]	—	—	e 63·8	75·3
Edinburgh		127·3	344	—	—	—	—	55·8	—
De Bilt		127·5	336	—	—	e 31 8	+84	e 57·8	60·6
Eskdalemuir		127·8	343	e 21 12	?PR_1	e 31 2	+76	54·8	70·7
Uccle		128·8	334	e 21 20	?PR_1	—	—	e 54·8	59·8
Stonyhurst		128·8	342	e 22 16	?PR_1	—	—	—	85·3
Strasbourg		128·9	330	—	—	—	—	e 68·3	—
Kew		130·1	339	—	—	—	—	—	145·8
Oxford		130·2	340	—	—	—	—	—	77·4
Rocca di Papa		130·5	321	e 19 28	[+8]	—	—	—	23·0
Paris		131·1	334	e 21 46	?PR_1	—	—	76·8	—
Moncalieri		131·4	328	e 22 7	?PR_1	—	—	67·7	—
La Paz		132·8	120	e 6 42	?	22 50	?PR_1	67·8	70·3
Tortosa		138·0	329	21 46	iPR_1	—	—	e 113·8	137·9
Coimbra		142·6	337	e 20 46	[+62]	e 26 2	?	e 71·8	—
San Fernando		144·8	331	—	—	—	—	86·2	116·2

Additional readings: Riverview gives also i=+6m.6s., PS=+10m.50s. and +11m.13s., MN=+15·6m., MZ=+16·0m. Sydney S=+13m.34s. Adelaide i=+13m.52s., e=+16m.46s. Perth PR_1=+10m.18s., SR_1=+18m.6s. Batavia i=+17m.26s. Honolulu eN=+19m.46s. Victoria S=+29m.36s. (?SR_1). Toronto e=+59m.46s., eL=+73·2m. Ottawa eLE=+37·3m. De Bilt ePR_1=+21m.14s., MN=+70·8m. Eskdalemuir MN=+77·7m. Rocca di Papa iPN=+19m.49s., PR_1=+21m.40s. Coimbra eL=+55·8m. San Fernando MN=+89·2m.

May 12d. Readings also at 5h. (Toronto), 10h. (La Paz), 16h. (Helwan), 18h. (near Tokyo).

May 13d. 1h.53m.10s. Epicentre 34°·6N. 140°·7E. (as on 1920 July 13d.).

A=−·637, B=+·521, C=+·568.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		1·1	6	0 33	+16	—	—	0·8	1·1
Tokyo		1·3	324	0 20	0	—	—	0·5	0·6
Mito		1·7	354	0 31	+ 5	(0 45)	− 3	0·8	0·9
Osaka		4·3	272	1 3	− 4	—	—	1·6	2·2
Mizusawa	E.	4·5	358	1 8	− 2	2 9	+ 5	—	—

Additional readings: Tyosi gives also MN=+1·0m. Mizusawa PN=+1m.9s.

May 13d. 12h. 41m. 45s. (I)
19h. 59m. 36s. (II)
21h. 9m. 20s. (III) } Epicentre 0°·7N. 117°·9E. (suggested by De Bilt).

$A = -\cdot468$, $B = +\cdot884$, $C = +\cdot012$; $D = +\cdot884$, $E = +\cdot468$;
$G = -\cdot006$, $H = +\cdot011$, $K = -1\cdot000$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Batavia	13·0	238	e 3 12	− 1	—	—	e 7·6	9·5
II		13·0	238	e 3 16	+ 3	—	—	i 7·3	8·8
III		13·0	238	e 3 0	−13	i 6 2	+18	—	9·9
I	Manila	14·2	12	e 3 55	+26	—	—	8·5	9·3
II		14·2	12	e 5 1	+91	—	—	7·9	8·5
III		14·2	12	e 3 14	−15	—	—	8·5	9·2
II	Perth	32·7	182	—	—	16 36	?L	(16·6)	—
III		32·7	182	9 15	?	15 0	?L	21·4	—
I	Colombo	38·4	280	24 15	?L	—	—	(24·2)	33·2
II		38·4	280	—	—	20 24	?L	31·4	32·4
III		38·4	280	—	—	23 40	?L	28·7	31·7
II	Kodaikanal	41·3	286	26 48	?	—	—	31·4	32·5
III		41·3	286	23 28	?L	—	—	26·6	32·3
I	Riverview	46·6	141	—	—	—	—	e 18·8	26·2
II		46·6	141	—	—	e 20 12	?	e 27·9	33·2
III		46·6	141	e 13 45	?	e 18 29	?	e 25·0	33·2
III	Sydney	46·6	141	—	—	15 4	−32	23·7	28·1
I	Helwan	86·7	300	24 15	?S	(24 15)	+37	(48·2)	—
II		86·7	300	24 24	?S	(24 24)	+46	—	—
III	Hamburg	99·9	325	—	—	—	—	50·7	—
I	Uccle	104·1	323	—	—	—	—	e 54·2	—
II		104·1	323	—	—	e 26 6	+28	e 28·4	—
III		104·1	323	—	—	—	—	e 53·7	—
I	De Bilt E.	104·3	324	—	—	—	—	e 58·2	67·9
I	N.	104·3	324	—	—	—	—	e 56·2	57·7
II	E.	104·3	324	e 19 50	?PR_1	e 26 4	−32	e 59·4	73·2
II	N.	104·3	324	—	—	—	—	e 57·4	62·1
III	E.	104·3	324	—	—	—	—	e 56·7	59·5
III	N.	104·3	324	—	—	—	—	e 55·7	57·4
I	Eskdalemuir	106·5	329	—	—	—	—	55·2	—
III		106·5	329	—	—	—	—	55·7	—
III	La Paz	163·1	160	20 15	[+ 5]	—	—	—	—

Additional readings: Batavia (II) iS? = +8m.26s., eL = +16·4m., (III) S = +6m.50s., MN = +7·4m. Manila (II) MN = +8·6m., (III) MN = +8·7m. Perth (II) PR_1 = +13m.25s., (III) PR_1 = +12m.14s., SR_1 = +19m.49s. Colombo (II) P = 19h.52m.0s. +32·7m., (III) MN = +31·9m. Riverview (I) MN = +26·8m., (II) MN = Helwan (II) PN = +29m.24s.

May 13d. Readings also at 5h. (La Paz (3)), 6h. (Helwan and La Paz), 8h. (La Paz (2)), 9h. (La Paz and Helwan), 10h. (Helwan and La Paz (3)), 11h. (La Paz (2), Helwan, and near Tokyo), 13h. (near Mostar), 14h. (La Paz (2)), 15h. (Helwan and La Paz (2)), 19h. (near La Paz (2)), 20h. (Batavia and Manila).

May 14d. 11h. 17m. 45s. Epicentre 0°·7N. 117°·9E. (as on May 13d., suggested by De Bilt).

$A = -\cdot468$, $B = +\cdot884$, $C = +\cdot012$; $D = +\cdot884$, $E = +\cdot468$;
$G = -\cdot006$, $H = +\cdot011$, $K = -1\cdot000$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia		13·0	238	2 49	−24	6 34	?L	(6·6)	8·3
Manila		14·2	12	3 27	− 2	—	—	8·2	9·0
Taihoku		24·6	8	e 5 39	+ 5	(9 57)	+ 2	10·0	—
Zi-ka-wei		30·7	7	e 4 35	−120	e 9 45	−121	—	—
Perth		32·7	182	11 38	?S	(11 38)	−41	(15·0)	—
Colombo		38·4	280	16 15	?L	24 15	?	29·2	30·8
Adelaide		40·6	150	—	—	i 13 51	−24	19·7	28·7
Kodaikanal		41·3	286	7 57	− 8	—	—	26·0	28·2
Mizusawa	E.	43·9	27	8 8	−17	14 29	−32	—	—
	N.	43·9	27	8 12	−13	14 36	−25	—	—
Riverview		46·6	141	e 8 28	−16	e 15 24	−12	e 22·8	25·7
Sydney		46·6	141	—	—	15 15	−21	28·7	32·0
Bombay		47·8	297	e 15 51	?S	(e 15 51)	0	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington		66·3	138	—	—	—	—	—	39·2
Honolulu		84·2	69	i 23 11	?S	(123 11)	+ 1	44·1	44·3
Helwan	E.	86·7	300	13 39	+42	—	—	—	58·0
	N.	86·7	300	18 15	?PR_1	—	—	—	57·5
Lemberg		92·0	320	—	—	23 51	−44	—	25·5
Budapest		95·5	319	e 18 15	?PR_1	e 26 15	+64	e 54·2	—
Hamburg		99·9	325	e 17 53	?PR_1	e 24 24	−91	e 52·2	58·2
Rocca di Papa	E.	100·8	313	e 17 27	[−22]	i 18 15	?PR_1	—	18·5
	N.	100·8	313	e 18 10	?PR_1	i 18 35	?PR_1	—	—
Strasbourg		102·6	320	16 45	[−71]	—	—	42·2	58·2
Moncalieri		103·6	317	e 18 29	?PR_1	28 34	+125	42·6	—
Besançon		104·1	319	19 0?	?PR_1	—	—	57·2	—
Uccle		104·1	323	e 18 33	?PR_1	e 24 55	−99	—	55·2
De Bilt	E.	104·3	324	—	—	e 24 46	−110	e 53·2	60·1
Paris		105·8	323	e 18 49	?PR_1	—	—	54·2	67·2
Edinburgh		106·2	330	—	—	—	—	59·2	—
Eskdalemuir	N.	106·5	329	18 48	?PR_1	e 25 3	−114	51·7	59·8
	E.	106·5	329	18 53	?PR_1	i 25 5	−112	—	60·2
Kew		106·5	325	(18 15)	?PR_1	—	—	—	18·2
Oxford		107·0	325	—	—	i 24 27	−154	—	62·4
Algiers		109·2	310	e 18 57	?PR_1	30 5	+164	70·2	75·8
La Paz		163·1	160	20 15	[+ 5]	30 51	?	82·2	—

Additional readings and notes: Batavia gives also i = +3m.9s. and +6m.17s., MN = +6·9m. Manila MN = +9·3m. Adelaide i = +9m.27s., e = +11m.15s., iSR_1 = +17m.9s., i = +18m.15s. and +18m.39s. Kodaikanal P has been increased by 10m. Riverview PS = +15m.44s., SR_1 = +18m.56s. and +19m.9s., MN = +26·7m., MZ = +37·1m. Honolulu SR_1N = +36m.38s. Budapest e = +34m.15s. Uccle e = +27m.45s. De Bilt ePR_1 = +18m.31s., MN = +57·6m.; epicentre as adopted. Paris MN = +55·2m. Eskdalemuir eN = iE = +28m.13s. La Paz S = +34m.20s., L = +94·2m. and +101·2m.

May 14d. 12h. 27m. 24s. Epicentre 29·°2S. 177°·0W. (as on 1919 Dec. 14d.).

A = −·872, B = −·046, C = −·488; D = −·052, E = +·999; G = +·487, H = +·026, K = −·873.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington		13·8	206	e 0 0	?	e 6 0	− 3	—	6·6
Riverview		27·5	251	e 5 53	−10	e 10 59	+ 9	e 12·9	14·8
Sydney		27·5	251	4 36	−87	—	—	12·4	14·6
Adelaide		37·8	249	—	—	—	—	e 16·1	23·6
Victoria		91·3	32	—	—	—	—	58·4	—
Kodaikanal		108·5	272	60 36	?L	—	—	(60·6)	65·2
Toronto		114·8	52	—	—	—	—	e 62·0	66·1
Ottawa	E.	117·8	51	—	—	—	—	e 61·1	—
Stonyhurst		155·1	8	—	—	—	—	—	62·1
De Bilt		157·1	357	—	—	—	—	e 88·6	91·2
Uccle		158·4	358	—	—	—	—	—	85·6

Additional readings: Riverview gives also MN = +13·9m. Adelaide e = +19m.6s. Ottawa LE = +68·6m. and +76·6m.

1921. May 14d. 20h. 18m. 3s. Epicentre **29°·2S. 177°·0W.** (as at 12h.).

A = −·872, B = −·046, C = −·488; D = −·052, E = +·999; G = +·487, H = +·026, K = −·873.

The epicentre given by Apia 9°·0S. 164°·0E. was first tried and modified to 8°·0S. 160°·0E. (as on 1920 Mar. 22d.). But this gave large positive residuals for the antipodal stations, though in other respects fairly satisfactory. See note at end.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington	13·8	206	e 4 21	+58	—	—	—	8·0
Apia	16·1	18	6 21	?S	(6 21)	−36	—	9·2
Christchurch	16·6	207	7 57	?S	(7 57)	+48	10·6	12·8
Riverview	27·5	251	1 6 10	+ 7	e 10 50	0	e 12·6	16·2
Sydney	27·5	251	5 57	− 6	11 3	+13	13·4	15·6
Adelaide	37·8	249	e 7 27	− 9	i 13 57	+22	e 18·0	24·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Honolulu	E.	53·8	22	9 16	−16	i 17 2	− 4	—	24·8
	N.	53·8	22	9 28	− 4	i 16 58	− 8	e 26·2	29·6
Perth		57·0	249	18 8	?S	18 8	+22	31·8	—
Manila		74·2	297	e 11 57	+14	—	—	—	—
Zi-ka-wei		84·2	311	—	—	—	—	e 44·0	—
Berkeley		84·3	40	—	—	e 39 37	?L	e 43·3	47·3
Victoria		91·3	32	35 41	?	—	—	—	46·5
La Paz		97·6	114	13 57	− 1	26 30	+58	53·0	57·8
Colombo		104·7	270	53 57	?L	—	—	66·0	69·0
Kodaikanal		108·5	272	61 57	?L	—	—	71·0	73·8
Chicago		108·5	51	—	—	25 57	−78	e 58·0	—
Ann Arbor		111·4	52	—	—	—	—	62·5	—
Toronto		114·8	52	—	—	e 27 9	−59	30·4	32·0
Georgetown		115·0	58	—	—	56 57	?L	e 62·0	—
Washington		115·0	58	—	—	—	—	e 66·6	—
Cape Town		115·2	194	64 4	?L	—	—	(64·1)	—
Ithaca		116·5	54	—	—	—	—	e 65·4	—
Ottawa	E.	117·8	51	—	—	e 26 3	−149	e 36·6	—
Edinburgh		152·9	8	—	—	—	—	e 85·0	97·0
Eskdalemuir		153·5	8	20 26	[+25]	—	—	85·0	89·4
Hamburg		155·1	350	e 19 57	[− 5]	—	—	e 78·0	93·0
Stonyhurst		155·1	8	e 35 27	?L	—	—	(e85·4)	152·0
Helwan		155·4	279	20 57	[+55]	27 57	?	—	—
De Bilt	E.	157·1	357	—	—	e 44 3	?	e 83·0	92·4
	N.	157·1	357	—	—	—	—	e 80·0	97·0
Oxford		157·2	7	24 55	?PR_1	—	—	44·0	93·2
Kew		157·6	6	—	—	—	—	—	99·0
Budapest		157·9	330	—	—	—	—	e 85·0	—
Vienna		158·3	335	e 20 4	[− 2]	—	—	e 49·0	90·4
Uccle		158·4	358	19 57	[− 9]	—	—	—	92·0
Strasbourg		160·3	351	19 55	[−13]	—	—	e 33·0	—
Paris		160·4	1	20 13	[+ 5]	e 33 23	?	86·0	102·0
Moncalieri		163·8	348	e 20 7	[− 4]	29 47	?	85·4	—
Florence		164·0	338	—	—	—	—	—	51·0
Rocca di Papa		165·2	331	e 20 15	[+ 3]	—	—	—	39·0
Coimbra	E.	165·5	37	e 27 52	?PR_1	e 43 57	?	e 84·2	—
	N.	165·5	37	e 24 14	?PR_1	32 14	?	e 85·0	—
Barcelona		167·7	3	—	—	—	—	e 87·5	95·2
Tortosa		168·1	11	e 18 57	[−77]	—	—	e 80·0	107·8
San Fernando		169·4	44	21 33	[+79]	—	—	90·8	98·4
Granada		170·3	33	25 41	?PR_1	—	—	e 72·0	—
Algiers		172·4	0	e 20 23	[+ 7]	e 31 22	?	49·0	99·0

Additional readings: Christchurch S? = +8m.57s. Riverview ePR_1 = +6m.50s. and +7m.4s., PS = +11m.10s., MN = +15·4m. Apia +6m.51s., T_0 = 20h.18m.21s.? origin 9°·0S. 164°·0E. Adelaide e = +9m.3s., i = +13m.27s. and +17m.15s. Perth S = +26m.22s., SR_1 = +28m.45s. Honolulu SR_1E = +22m.39s. Toronto iL = +36·2m. Ottawa eE = +29m.57s. Georgetown LN = +67·1m. Budapest e = +89m.57s. Hamburg MZ = +100·0m. Eskdalemuir eN = +22m.58s. and +34m.8s., MN = +87·3m. De Bilt ePR_1N = +20m.25s. Uccle MN = +97·0m. Florence gives P = 19h.46m.? Coimbra eLN = +64·1m. San Fernando MN = +95·4m. Algiers MN = +108·4m.

With T_0 = 20h.18m.15s., epicentre 8°·0S. 160°·0E. (as on 1920 Mar. 22d.), we have the following residuals for [P]:—

	Δ	[P]		Δ	[P]
	°	s.		°	s.
Hamburg	128·4	+30	Paris	135·0	+31
Vienna	129·4	+35	Rocca di Papa	135·6	+32
Eskdalemuir	130·8	+53	Moncalieri	135·9	+23
Uccle	132·6	+21	Tortosa	142·4	−59
Strasbourg	133·2	+17	Algiers	144·4	+21

Near the epicentre the solution is not unsuitable:—

	Δ	P.	S.	L.		Δ	P.	S.	L.
	°	s.	s.	m.		°	s.	s.	m.
Riverview	27·1	− 1	− 5	12·4	Honolulu	50·5	0	+23	26·0
Sydney	27·1	−14	+ 8	13·2	Zi-ka-wei	53·8	—	—	43·8
Apia	28·3	− 2	—	—	Colombo	81·3	?	—	65·8
Adelaide	33·4	+15	+75	17·8	Kodaikanal	84·3	?	—	70·8
Christchurch	37·2	+13	—	10·4	Berkeley	85·4	—	?	43·1
Perth	47·4	—	+130	31·6	Victoria	87·3	?	?	—

The columns for P and S are residuals; that for L is L − T_0.

May 14d. 22h. 9m. 30s. Epicentre 20°·0N. 103°·0W.

A = −·211, B = −·916, C = +·342; D = −·974, E = +·225; G = −·077, H = −·333, K = −·940.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tacubaya		3·6	99	1 15	+19	—	—	2·5	3·0
Mazatlan		4·5	316	1 11	+ 1	(2 1)	− 3	2·0	3·9
Puebla		4·6	101	0 41	−30	(2 1)	− 5	2·0	2·3
Vera Cruz		6·5	95	2 1	+22	—	—	4·0	4·9
Oaxaca		6·6	115	3 41	?L	—	—	5·5	5·9
Tucson	E.	14·2	332	3 46	+17	—	—	6·8	8·7
	N.	14·2	332	3 23	− 6	—	—	e 8·0	8·9
Denver	E.	19·8	356	—	—	—	—	9·5	12·5
	N.	19·8	356	—	—	—	—	10·0	10·0
Berkeley	E.	24·5	321	i 5 17	−16	—	—	—	13·8
	N.	24·5	321	e 5 7	−26	—	—	—	14·8
Chicago		25·4	27	5 40	− 2	10 8	− 3	12·3	—
Ann Arbor		27·6	32	—	—	—	—	15·8	—
Georgetown		29·2	44	e 6 41	+21	—	—	20·6	—
Washington		29·2	44	6 0	−20	20 30	?L	(20·5)	—
Cheltenham	E.	29·3	45	7 9	+48	11 54	+32	—	18·3
	N.	29·3	45	7 4	+43	—	—	14·2	20·7
Toronto		30·8	35	—	—	e 12 42	+54	—	31·4
Ithaca		31·6	40	e 7 30	+47	—	—	e 18·2	—
Victoria		32·8	336	—	—	(11 9)	−72	11·2	18·7
Ottawa		33·9	36	e 7 0	− 4	e 12 30	− 9	e 19·2	—
Northfield		34·9	40	—	—	e 15 30	?SR_1	23·2	—
La Paz		50·0	136	i 9 6	− 1	16 17	− 2	22·0	26·5
Honolulu	N.	51·3	282	—	—	—	—	26·1	26·4
Eskdalemuir		79·0	35	e 4 30	?	—	—	38·5	—
Stonyhurst		80·0	38	—	—	—	—	—	109·5
Oxford		81·4	39	—	—	—	—	—	49·2
Kew		82·0	39	—	—	—	—	—	48·5
De Bilt	E.	84·8	36	—	—	—	—	e 42·5	50·6
	N.	84·8	36	—	—	—	—	e 38·5	45·7
Uccle		85·0	38	—	—	—	—	e 37·5	50·5
Granada		85·2	53	i 12 49	0	—	—	—	—
Hamburg		86·7	34	e 15 30	?	—	—	e 45·5	50·5
Strasbourg		87·9	39	—	—	—	—	e 45·5	50·5
Vienna		93·0	35	13 21	−11	—	—	—	66·4

Additional readings and notes: Puebla readings increased by 5m. Ann Arbor gives also LN = +15·6m. Ithaca LN = +20·9m. Ottawa e = +8m.6s., eE = +16m.6s. Honolulu eE = +21m.2s., eN = +21m.10s. (may be eSR_1), eE = +22m.35s., eN = +24m.30s., ME = +25·5m. Hamburg MN = +53·5m.

May 14d. Readings also at 1h. (Manila), 2h., 5h., and 9h. (near La Paz), 12h. (Tokyo), 15h. (Perth), 18h. (Helwan), 19h. (near Mostar), 21h. (Strasbourg, Ottawa, and Toronto), 22h. (near Mizusawa).

May 15d. Readings at 2h. (near Manila), 3h. (near Padova), 4h. (La Paz), 8h. (near Sarajevo and Belgrade), 14h. (Batavia, La Paz, and Manila), 15h. (La Paz), 20h. (near Mizusawa), 22h. (Taihoku).

May 16d. 15h. 12m. 36s. Epicentre 23°·5S. 178°·0E.

A = −·916, B = +·032, C = −·399; D = +·035, E = +·999; G = +·398, H = −·014, K = −·917.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		13·7	47	—	—	5 24?	−37	—	—
Wellington		18·0	188	e 3 30	−47	—	—	6·2	7·4
Riverview		25·6	240	e 5 43	− 1	e 10 15	+ 1	e 12·0	15·9
Sydney		25·6	240	5 18	−26	10 12	− 2	13·5	14·9
Adelaide		36·0	243	e 8 6	+44	i 12 24	−46	e 17·2	23·4
Honolulu	E.	50·6	31	—	—	—	—	e 20·1	26·8
	N.	50·6	31	—	—	—	—	e 25·5	48·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		67·5	301	e 11 0	− 1	—	—	—	—
Lick	E.	83·2	46	—	—	—	—	e 44·1	—
Victoria		89·0	35	—	—	—	—	43·1	46·1
Kodaikanal		103·7	277	59 18	?L	—	—	(59·3)	—
La Paz		104·0	117	—	—	—	—	53·4	—
Chicago		108·6	52	—	—	e 30 24	?	55·4	—
Toronto		114·9	50	—	—	—	—	e 43·1	71·3
Ottawa	E.	117·7	49	—	—	e 26 24	−128	e 63·4	—
Helwan		149·7	289	30 24	?	—	—	(64·4)	—
De Bilt		150·9	351	—	—	e 37 42	?	e 87·4	97·8
Paris		154·4	353	—	—	e 90 24	?L	e 99·4	104·4
Moncalieri		157·1	342	e 23 18	?PR_1	—	—	49·8	—
Tortosa		162·6	354	—	—	—	—	e 100·4	106·8

Additional readings and notes: Riverview gives also MN = +14·8m., MZ = +16·2m. Adelaide e = +19m.54s. Victoria L = +44·8m. Toronto eL = +63·3m. and +68·5m., L? = +108·8m? Ottawa e?E = +50m.24s. De Bilt MN = +97·4m.

May 16d. Readings also at 0h. (Helwan), 3h. (near Rocca di Papa and Florence), 7h. and 11h. (La Paz), 12h. (Helwan), 15h., 17h. (2), 18h., and 19h. (2) (La Paz), 20h. (Pompeii), 22h. and 23h. (2) (near La Paz).

May 17d. 23h. 14m. 45s. (I) } Epicentre 21°·0N. 127°·0E. (as on 1919 May 16d.).
23h. 26m. 20s. (II) }

A = −·562, B = +·746, C = +·358; D = +·799, E = +·602;
G = −·216, H = +·286, K = −·934.

The La Paz observation suggests that T_0 might be increased by about 20s. or more; and this would introduce no serious discrepancy elsewhere, but the material is scanty.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Taihoku	6·4	310	—	—	—	—	e 4·8	—
I	Manila	8·6	223	—	—	—	—	e 5·1	—
II		8·6	223	—	—	—	—	e 4·7	—
I	Zi-ka-wei	11·4	335	e 2 57	+ 7	—	—	—	8·2
II		11·4	335	e 2 40	−10	e 5 6	+ 2	—	7·2
I	Nagasaki	12·1	12	e 1 20	−100	—	—	—	—
I	Osaka	15·6	27	3 45	− 2	—	—	—	—
II		15·6	27	—	—	—	—	—	8·4
I	Tokyo	18·4	35	e 5 31	+69	e 7 14	−35	e 9·9	15·5
II	Helwan	84·4	300	23 40	?S	(23 40)	+28	—	—
II	Vienna	87·2	323	i 13 7	+ 7	e 24 34	+51	e 43·7	55·2
I	Hamburg	88·0	328	e 13 15	+10	—	—	—	—
II		88·0	328	13 6	+ 1	—	—	e 37·7	48·7
II	De Bilt E.	91·1	328	e 13 42	+20	e 24 8	−17	e 35·2	51·6
II	N.	91·1	328	—	—	—	—	e 45·7	52·2
II	Uccle	92·4	327	—	—	e 23 58	−41	e 45·7	58·7
II	Florence	92·6	320	42 20	?L	—	—	(42·3)	53·2
II	Strasbourg	92·7	325	e 13 40	+ 9	e 24 21	−21	e 38·7	50·9
II	Rocca di Papa	92·8	316	i 13 58	+27	—	—	e 47·7	54·2
II	Eskdalemuir	92·8	334	—	—	e 23 57	−46	46·3	48·0
II	Stonyhurst	93·5	333	e 24 40	?S	(24 40)	−11	—	55·2
II	Moncalieri	94·0	322	—	—	e 24 29	−27	47·4	—
II	Kew	94·1	330	—	—	—	—	—	53·7
II	Oxford	94·4	330	—	—	i 30 30	?SR_1	41·9	53·5
II	Tortosa	100·7	322	—	—	—	—	e 47·7	63·0
II	Algiers	101·7	318	—	—	—	—	43·7	—
II	Coimbra E.	106·1	325	40 18	?	46 58	?	e 53·7	59·1
II	N.	106·1	325	—	—	—	—	e 54·7	59·0
II	San Fernando	107·6	323	—	—	—	—	—	56·2
II	La Paz	165·0	75	(20 45)	[+33]	—	—	—	—

Additional readings and notes: Zi-ka-wei (II) gives also MN = +8·1m. Osaka (II) MN = +13·4m. Tokyo (I) MN = +10·2m. Helwan PN = +22m.40s. Uccle gives its readings as on 18d. Rocca di Papa L = +51·1m. San Fernando MN = +68·2m.

May 17d. Readings also at 5h. (Moncalieri and near Lick), 6h. (Moncalieri), 8h. (Manila), 10h. (Manila), 11h. (La Paz and near Athens), 13h. (La Paz), 16h. (Uccle), 21h. (near Mizusawa).

May 18d. Readings at 0h. (near Algiers), 1h. (Algiers and near Mizusawa), 5h. (Batavia), 7h. (near Tokyo, near Tacubaya, and Vera Cruz), 8h. (Manila), 9h. (De Bilt), 12h. (La Paz), 13h. (Apia), 15h. (La Paz), 16h. (Manila), 18h. (near Batavia), 20h. (Taihoku (2)), 23h. (near Batavia).

May 19d. Readings at 0h. (near Tacubaya), 3h. (La Paz and Uccle), 4h. (La Paz (2)), 9h. (near Tacubaya), 14h. (Helwan), 15h. (near Oaxaca and Tacubaya), 18h. (La Paz), 19h. (Helwan), 22h. (Florence and La Paz).

1921. May 20d. 0h. 43m. 10s. Epicentre 35°·0N. 69°·0E.

(as on 1920 Feb. 27d.).

A = +·294, B = +·765, C = +·574 ; D = +·934, E = −·358 ;
G = +·205, H = +·536, K = −·819.

This old origin is retained in spite of the poverty of the material on the previous date. A focal depth of 0·030 has been adopted.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Simla		−0·2	7·9	117	1 50	− 7	e 3 14	−15	—	—
Dehra Dun		−0·3	8·9	119	1 50	−20	—	—	—	—
Bombay		−0·9	16·5	167	3 9	−38	6 18	−28	—	6·5
Calcutta	E.	−1·3	21·0	122	4 26	−11	(8 2)	−15	8·0	8·4
	N.	−1·3	21·0	122	4 32	− 5	(8 20)	+ 3	8·3	8·6
Kodaikanal		−1·6	25·9	161	9 56	?S	(9 56)	+ 6	11·0	12·0
Colombo		−2·0	29·8	158	—	—	—	—	12·3	15·8
Helwan	E.	−2·1	32·0	271	6 20	− 7	11 26	− 6	—	26·2
	N.	−2·1	32·0	271	7 26	+59	12 14	+42	—	16·8
Lemberg		−2·3	35·7	310	e 6 44	−16	—	—	e 14·7	19·5
Athens		−2·3	36·3	289	e 7 5	0	i 12 36	− 4	e 18·3	20·2
Belgrade		−2·4	37·9	300	i 7 16	− 2	i 12 56	− 7	—	19·3
Budapest		−2·5	38·8	307	e 6 45	−39	e 12 30	−44	e 15·8	—
Mostar		−2·5	39·9	298	i 7 18	−15	i 13 20	−10	—	13·4
Vienna		−2·5	40·6	309	i 7 27	−12	9 10	?PR_1	i 13·6	17·8
		−2·5	40·6	309	i 7 42	+ 3	—	—	i 13·6	19·7
Pola		−2·7	42·5	301	e 7 47	− 6	i 13 55	− 8	i 17·2	17·7
Pompeii	E.	−2·7	42·7	296	7 54	− 1	14 4	− 3	41·8	—
Zi-ka-wei		−2·7	43·6	80	e 7 42	−20	—	—	—	—
Rocca di Papa		−2·7	43·9	296	i 8 4	− 1	i 14 22	− 2	—	—
Florence		−2·8	44·5	300	8 20	+11	—	—	—	17·8
Zurich		−2·9	45·9	304	e 8 18	0	i 14 50	+ 2	—	—
Strasbourg		−2·9	46·3	307	i 8 22	+ 1	i 14 55	+ 1	e 19·8	22·7
Moncalieri		−2·9	46·8	302	8 29	+ 4	15 3	+ 2	19·5	21·0
De Bilt		−3·0	47·6	312	8 31	+ 1	i 15 12	+ 2	e 19·4	19·6
Besançon		−3·0	47·7	306	8 31	0	15 21?	+10	19·8	—
Uccle		−3·0	48·2	310	i 8 35	+ 1	i 15 21	+ 3	19·3	—
Paris		−3·1	49·7	310	i 8 47	+ 3	i 15 42	+ 6	19·8	21·8
Manila		−3·1	50·8	100	e 7 50	−62	—	—	—	—
Kew		−3·1	51·0	312	5 50	?	—	—	—	31·8
Dyce	E.	−3·2	51·3	320	8 55	0	15 58	+ 3	20·1	20·6
Barcelona		−3·2	51·6	298	9 4	+ 8	i 16 10	+11	21·5	26·4
Stonyhurst		−3·2	51·9	314	9 2	+ 4	14 2	−120	20·4	21·8
Eskdalemuir		−3·2	52·1	317	i 9 3	+ 4	i 16 9	+ 4	23·6	—
Edinburgh		−3·2	52·1	317	9 2	+ 3	16 10	+ 5	20·8	22·3
Algiers		−3·2	52·3	292	9 8	+ 7	i 16 21	+14	23·8	39·8
Tortosa		−3·3	53·0	299	9 12	+ 7	16 27	+12	22·7	22·8
Batavia		−3·4	54·5	132	9 44	+30	16 31	− 1	—	—
Granada		−3·5	57·2	295	i 9 40	+ 9	i 17 29	+24	—	—
San Fernando		−3·6	59·4	295	9 2	−43	16 56	−35	—	26·1
Coimbra	E.	−3·6	59·6	300	10 1	+15	i 17 57	+23	27·5	29·3
	N.	−3·6	59·6	300	—	—	—	—	27·2	28·2
Ottawa		−4·3	93·6	336	e 13 0	−12	23 15	−51	43·8	—
Toronto		−4·3	96·1	338	—	—	—	—	43·0	45·1
Victoria		−4·3	97·2	9	—	—	—	—	44·4	—
Ann Arbor		−4·4	98·7	340	—	—	—	—	43·6	—
Georgetown		−4·4	99·7	334	e 16 34	?PR_1	i 23 54	−75	—	—
Washington		−4·4	99·7	334	e 19 45	?	23 46	−83	—	—
Chicago		−4·4	100·2	343	13 30	−18	23 40	−94	40·8	—
Melbourne		−4·4	101·3	130	—	—	—	—	—	48·0
Riverview		−4·5	103·1	124	—	—	e 32 38	?SR_1	e 42·5	46·1
La Paz		—	137·6	284	i 19 24	[−11]	31 56	?	61·8	87·3

For Notes see next page.

NOTES TO MAY 20d. 0h. 43m. 10s.

Additional readings: Athens gives also iP = +7m.10s., PR_1E = +8m.7s., MN = +20·0m. Belgrade gives its reading 1h. late. Budapest e = +8m.23s. Mostar PR_1 = +9m.26s., readings given 1h. late. Vienna i = +7m.44s. Pola MN = +17·4m. Rocca di Papa iPN = +8m.6s. Strasbourg SR_1 = +17m.51s., MN = +20·9m., MZ = +23·1m. Barcelona SR_1 = +18m.27s. Moncalieri MN = +23·1m. De Bilt MN = +26·3m. Epicentre 37°·9N. 67°·4E. Uccle PR_1 = +10m.32s., SR_1 = +18m.4s. Epicentre 37°·5N. 67°·3E. Dyce PR_1 = +10m.56s. Eskdalemuir PR_1 = +11m.4s., SR_1? = +18m.31s., SR_2 = +20m.59s., T_e = 0h.43m.17s. San Fernando MN = +25·7m. Coimbra ePR_1 = +12m.11s., SR_1N = +19m.21s. T_e = 0h.43m.19s. Ottawa eN = +18m.0s., LE = +51·8m. Toronto eL = +44·2m. Victoria L = +38·3m. Ann Arbor LN = +45·7m. Riverview MN = +46·4m. La Paz PR_1 = +22m.6s., T_e = 0h.47m.13s.

May 20d. 13h. 22m. 0s. Epicentre 2°·0S. 128°·5E.

A = −·622, B = +·782, C = −·035; D = +·783, E = +·622; G = +·022, H = −·027, K = −·999.

A high focus, as indicated by La Paz, would, in some ways, suit the observations better; but the material is scanty.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	18·2	336	e 4 33	+14	—	—	—	—
Batavia	22·0	258	5 4	− 1	9 2	− 3	10·4	—
Perth	32·2	200	—	—	13 29	+78	19·5	—
Zi-ka-wei	33·9	352	e 6 58	− 6	—	—	—	—
Riverview	38·2	148	e 8 32	+52	—	—	e 22·9	23·7
Sydney	38·2	148	16 12	?S	20 48	?L	26·1	28·2
Melbourne	38·8	159	13 48?	?S	(13 48?)	− 1	19·8?	24·1
Colombo	49·4	281	—	—	—	—	—	35·0
Helwan	97·2	300	37 0	?	—	—	(57·0)	—
De Bilt	111·4	326	—	—	—	—	e 56·0	—
Uccle	112·4	325	—	—	—	—	—	62·0
La Paz	155·2	139	i 20 19	[+17]	—	—	—	—

Additional readings: Perth gives also PR_1 = +9m.1s., SR_1 = +17m.10s. Riverview MN = +24·5m. Melbourne S = +16m.36s?

May 20d. 18h. 15m. 40s. Epicentre 43°·8N. 11°·2E. (as on 1920 Dec. 27d.).

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 8?	+ 8	—	—	—	0·5
Padova	1·7	17	0 18	− 8	0 50	+ 2	—	1·1
Rocca di Papa E.	2·3	152	—	—	—	—	e 1·3	2·5
Moncalieri	2·8	295	e 0 51	+ 7	—	—	—	—
Strasbourg	5·3	334	e 2 43	?L	—	—	(e 2·7)	—

Additional readings: Florence gives also P = +0m.32s., M = +0·8m? Rocca di Papa eE = +1m.44s., eN = +2m.10s. and +2m.23s.

May 20d. Readings also at 1h. (near Osaka and Tokyo), 2h. (La Paz and Riverview), 3h. (La Paz), 4h. (La Paz and near Osaka and Tokyo), 5h. (near Osaka and Tokyo), 6h. (Florence), 8h. (Pompeii and Rocca di Papa), 10h. (Rocca di Papa (2) and Pompeii), 13h. (De Bilt, Lemberg, and Hamburg), 15h. (La Paz), 21h. (La Paz, Rocca di Papa, De Bilt, Belgrade, and near Athens).

1921. May 21d. 8h. 42m. 0s. Epicentre **12°·5N. 124°·5E.**

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 21	+19	—	—	2·4	—
Taihoku		12·8	348	e 3 24	+14	(5 41)	+ 2	5·7	9·4
Zi-ka-wei		18·9	352	e 4 30	+ 2	e 7 54	− 6	—	10·8
Nagasaki		20·9	13	4 51	− 1	(8 40)	− 2	8·7	—
Hukuoka		21·8	14	4 58	− 5	8 58	− 3	11·5	15·3
Osaka		24·3	22	5 22	− 9	9 29	−21	—	18·5
Jinsen		25·1	4	6 26	+47	10 53	+48	—	19·7
Batavia		25·6	224	e 5 42	− 2	—	—	e 17·0	—
Tokyo		27·0	28	6 0	+ 2	11 20	+39	e 15·5	16·3
Ootomari		37·5	22	3 10	?	—	—	—	—
Calcutta	E.	35·8	291	5 48	−92	10 18	−169	14·1	20·3
	N.	35·8	291	5 54	−86	10 48	−139	15·4	22·9
Colombo		44·3	269	9 0	+32	14 0	−66	25·0	34·0
Kodaikanal		46·1	274	14 6	?S	(14 6)	−83	29·4	31·9
Adelaide		49·3	164	e 8 36	−26	i 16 12	+ 2	e 22·4	43·6
Riverview		52·8	151	9 18	− 7	e 16 57	+ 3	e 25·9	30·3
Sydney		52·8	151	8 30	−55	17 0	+ 6	27·2	35·5
Melbourne		53·8	160	9 30	− 2	17 18	+12	27·1	38·4
Wellington		71·0	145	—	—	e 21 0	+22	e 35·8	40·0
Honolulu	E.	74·4	71	11 51	+ 6	21 31	+12	35·6	45·8
	N.	74·4	71	—	—	i 21 16	− 3	—	31·0
Helwan	E.	86·5	300	13 24	+28	—	—	—	60·1
	N.	86·5	300	22 54	?S	(22 54)	−42	—	63·4
Lemberg		87·1	320	e 13 0	0	e 23 24	−18	e 51·3	57·8
Budapest		91·0	310	e 13 11	−10	23 34	−50	e 50·0	59·2
Vienna		92·4	322	13 26	− 3	23 33	−66	e 40·0	58·5
Hamburg		93·9	327	e 13 32	− 5	i 24 7	−48	e 43·0	58·3
Victoria		94·8	38	—	—	(25 16)	+12	25·3	53·8
Pola		95·2	319	e 24 12	?S	(e 24 12)	−56	e 54·7	61·4
Pompeii		96·1	315	14 14	+24	18 0	?PR_1	—	—
De Bilt		97·1	327	e 13 54	− 1	i 24 23	−64	e 53·0	60·7
Rocca di Papa	E.	97·3	316	i 13 49	− 7	e 17 40	?PR_1	e 45·9	57·4
	N.	97·3	316	i 13 52	− 4	i 17 46	?PR_1	e 52·9	—
Strasbourg		97·5	323	13 47	−10	e 24 20	−71	e 34·0	61·9
Dyce		97·7	334	24 13	?S	(24 13)	−80	48·4	58·9
Uccle		98·2	326	e 17 0	?PR_1	e 24 28	−70	e 46·0	62·4
Edinburgh		99·0	333	—	—	24 20	→86	—	61·7
Moncalieri		99·1	320	14 6	0	24 29	−78	39·4	64·0
Besançon		99·2	323	—	—	24 45	−63	—	54·0
Eskdalemuir		99·3	333	e 14 13	+ 6	24 31	−78	46·6	61·3
Stonyhurst		99·9	330	24 30?	?S	(24 30?)	−85	—	65·5
Kew		100·2	329	46 0	?L	—	—	(46·0)	64·0
Paris		100·2	325	—	—	e 24 40	−78	50·0	55·0
Oxford		100·7	329	i 18 15	?PR_1	i 24 36	−86	—	64·6
Tortosa		105·7	319	—	—	—	—	e 54·0	68·5
Algiers		106·1	315	—	—	25 7	−106	47·0	71·5
Cape Town		110·1	237	25 36	?S	(25 36)	−113	—	64·4
Granada		110·5	318	17 39	?	i 27 43	+10	—	—
Coimbra	E.	111·6	323	e 18 48	?	—	—	e 49·4	71·4
	N.	111·6	323	—	—	30 16	?	e 58·3	71·3
San Fernando	E.	112·6	319	—	—	—	—	—	68·6
Chicago		118·2	26	20 17	?PR_1	29 58	+82	45·2	—
Ottawa		119·3	14	e 20 18	?PR_1	—	—	55·0	—
Ann Arbor		119·4	21	—	—	—	—	19·5	—
Toronto		119·8	17	—	—	—	—	67·6	83·2
Georgetown		124·8	18	e 19 0	[− 5]	—	—	e 49·5	—
La Paz		167·1	110	20 25	[+12]	34 43	?	82·3	107·8

Additional readings: Zi-ka-wei gives also PSE = +8m.14s., MN = +11·4m. Osaka MN = +21·4m. Tokyo MN = +16·0m. Adelaide i = +20m.0s. Riverview eP = +9m.34s., eS = +17m.4s. (alternatives ?), eSR_1 = +20m.58s. and +21m.10s. Sydney SR_2 = +21m.36s. Melbourne SR_1 = +21m.12s., SR_2 = +22m.36s. Wellington e = +25m.48s. and +32m.30s. Honolulu eSR_1E = +26m.31s. Budapest e = +13m.45s., +16m.55s., and L = +27·1m. Hamburg SR_2 = +38m.0s., MN = +59·0m. Pola MN = +63·0m. De Bilt ePR_1 = +17m.45s., MN = +60.4m. Strasbourg MN = +54·9m. Dyce i = +34m.53s. Uccle MN = +55·5m. Moncalieri MN = +65·7m. Eskdalemuir e? = +18m.7s. Tortosa readings increased by 1h. Ottawa eLE = +36·7m. Ann Arbor LN = +19·7m. Toronto L = +39·9m., eL = +81·4m., and +100·1m.

May 21d. 11h. 10m. 20s. Epicentre 35°·0N. 16°·0W.

A = +·787, B = −·226, C = +·574; D = −·276, E = −·961; G = +·551, H = −·158, K = −·819.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Coimbra	7·9	47	—	—	—	—	5·7	—
Paris	19·4	39	e 4 35	+ 1	e 8 14	+ 4	11·0	10·7
Moncalieri	20·6	54	5 45	+57	9 42	+66	13·6	—
Uccle	21·6	37	e 4 45	−15	e 9 4	+ 7	e 11·0	—
Strasbourg	22·1	45	e 5 6	0	—	—	e 12·8	13·6
Eskdalemuir	22·1	20	7 40	?	—	—	—	—
De Bilt	22·8	35	—	—	e 9 14	− 7	e 11·7	13·4
Rocca di Papa	23·4	65	e 5 20	− 1	—	—	—	6·3
Hamburg	26·0	36	7 40	?PR_1	—	—	—	—
Ottawa	45·7	302	—	—	—	—	e 17·7	—
Toronto	48·6	300	—	—	—	—	21·6	—
Chicago	54·9	300	—	—	e 12 40	?PR_1	21·2	—
Manila	115·8	47	e 49 25	?L	—	—	(e 49·4)	—

Additional readings: Strasbourg gives also MN = +13·5m. Eskdalemuir gives simply 11h.18m. to 11h.30m.

1921. May 21d. 22h. 25m. 42s. Epicentre 48°·0N. 157°·0E.

A = −·616, B = +·261, C = +·743; D = +·391, E = +·920; G = −·684, H = +·290, K = −·669.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		9·8	267	2 25	− 2	—	—	4·6	5·8
Hakodate		13·1	247	3 27	+13	3 53	−113	7·1	7·7
Mito		16·8	232	5 15	+73	—	—	7·5	12·3
Tokyo		17·8	232	4 19	+ 4	7 38	+ 2	e 9·5	9·9
Osaka		20·9	238	4 54	+ 2	8 54	+12	—	13·9
Kobe	E.	21·0	239	e 4 51	− 2	—	—	11·8	—
Hukuoka		24·6	244	5 19	−15	9 44	−11	12·6	17·6
Jinsen		24·6	256	6 26	+52	10 54	+59	—	17·1
Nagasaki		25·5	243	5 42	− 1	—	—	—	—
Zi-ka-wei		31·8	250	e 6 35	−10	e 11 33	−32	—	20·2
Taihoku		36·1	241	—	—	e 12 54	−17	—	—
Honolulu	E.	44·6	110	i 15 20	?S	(i 15 20)	+10	20·8	25·5
	N.	44·6	110	—	—	18 56	?SR_1	20·5	21·2
Manila		44·7	232	e 8 32	+ 1	—	—	—	—
Victoria		50·5	57	6 35	?	12 59	?PR_1	21·3	31·2
Berkeley		57·2	68	—	—	—	—	e 27·6	33·6
Calcutta		59·4	271	5 24	?	—	—	—	—
Simla		61·0	285	—	—	—	—	e 34·2	—
Batavia		69·8	234	e 11 27	+11	e 20 38	+14	—	—
Dyce		73·4	349	e 11 32	− 6	21 47	+40	41·0	51·7
Chicago		73·6	45	11 38	− 2	21 10	+ 1	36·6	—
Lemberg		74·1	330	e 11 36	− 7	e 21 12	− 3	e 38·5	43·2
Hamburg		74·7	340	e 11 49	+ 2	e 21 27	+ 5	e 35·3	46·9
Edinburgh		74·8	349	—	—	21 18	− 6	—	52·8
Eskdalemuir		75·3	349	11 51	0	21 32	+ 3	36·3	63·8
Kodaikanal		75·5	270	15 18	?PR_1	—	—	39·3	44·7
Ottawa		75·8	35	e 15 37	?PR_1	e 21 33	− 2	48·8	—
Toronto		75·8	39	—	—	e 23 6	+91	e 39·8	47·1
Colombo		76·3	266	44 18?	?	49 18	?	56·3	60·3
Stonyhurst		76·6	348	21 48	?S	(21 48)	+ 4	—	55·8
De Bilt		77·1	343	12 2	0	21 51	+ 1	e 38·3	50·9
Budapest		77·8	333	e 11 56	−10	e 22 11	+13	e 38·3	49·3
Vienna		77·9	335	i 12 7	+ 1	e 22 7	+ 8	e 38·3	49·3
Oxford		78·4	347	12 12	+ 3	22 14	+ 9	—	53·2
Uccle		78·4	344	e 12 9	0	e 22 5	0	e 38·3	47·8
Kew		78·7	347	27 18	?SR_1	—	—	—	69·3
Belgrade		79·7	330	e 13 35	+78	e 22 37	+17	e 33·8	49·4
Strasbourg		79·9	340	12 16	− 2	e 22 8	−14	e 31·3	54·0
Georgetown	E.	80·6	40	e 19 5	?PR_1	—	—	50·8	—
	N.	80·6	40	—	—	e 21 28	−62	51·6	—
Paris		80·7	344	e 12 24	+ 1	e 22 28	− 3	41·3	53·3
Besançon		81·5	341	12 27	− 1	—	—	45·3	—
Pola		81·7	335	e 22 30	?S	(e 22 30)	−13	e 44·0	52·1

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	82·0	186	—	—	e 32 36	?	e 42·8	57·5
Moncalieri	83·2	339	10 42	−115	21 45	−74	33·1	55·0
Florence	83·4	336	66 24?	?L	—	—	(66·4)	—
Rocca di Papa	84·9	334	i 12 45	− 2	i 16 2	?PR$_1$	e 46·2	57·2
Pompeii	85·2	332	12 18	−31	—	—	—	—
Barcelona	87·8	341	—	—	—	—	e 46·0	57·2
Helwan	88·2	316	15 18	+132	—	—	—	—
Tortosa	88·8	343	12 59	−10	23 31	−30	e 41·3	54·6
Coimbra	90·9	349	e 11 4	−137	23 39	−44	e 45·3	60·6
Algiers	92·9	339	—	—	e 24 34	−10	49·3	58·8
Granada	93·1	345	—	—	—	—	e 53·0	—
San Fernando	94·2	347	—	—	—	—	—	65·1
La Paz	131·6	63	19 39	[+17]	i 23 0	?PR$_1$	82·3	83·7

Additional readings and notes: Ootomari gives MN = +5·4m. Tokyo MN = +9·1m. Mito MN = +9·7m. Osaka MN = +15·2m. Zi-ka-wei MN = +19·5m. Honolulu SE = +19m.4s. (?SR$_1$E). Calcutta PN = +5m.30s. Dyce readings have all been diminished by 1h. Hamburg SR$_2$ = +30m.8s., MNZ = +49·6m. Ottawa e = +30m.18s. and eE = +34m.18s. Toronto e = +29m.48s., eL = +49·3m. De Bilt SR$_1$ = +27m.16s., MN = +49·8m. Budapest e = +32m.20s. Uccle SR$_1$ = +27m.33s., MN = +52·1m. Strasbourg MN = +52·5m. Pola MN = +52·7m. Riverview MN = +45·1m. Moncalieri MN = +48·9m. Pompeii reading has been increased by 10m. Coimbra MN = +61·0m.

May 21d. 23h. 37m. 20s. Epicentre 12°·5N. 124°·5E. (as at 8h.).

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	4·0	302	e 1 19	+17	—	—	2·4	3·0
Taihoku	12·8	348	e 4 36	+86	—	—	—	—
Zi-ka-wei	18·9	352	e 4 23	− 5	e 7 49	−11	—	—
Osaka	24·3	22	5 9	−22	—	—	—	23·3
Batavia	25·6	224	e 5 54	+10	i 9 0	−74	—	—
Riverview	52·8	151	—	—	e 16 46	− 8	e 28·9	—
Hamburg	93·9	327	—	—	e 22 40	−135	e 53·7	—
De Bilt	97·1	327	—	—	—	—	e 55·7	60·8
Florence	97·4	319	10 40	?	—	—	—	42·7
Eskdalemuir	99·3	333	—	—	—	—	52·7	—
La Paz	167·1	110	20 23	[+10]	—	—	—	—

Additional readings: Osaka gives also MN = +12·1m. De Bilt MN = +60·4m.

May 21d. Readings also at 2h. (near Tokyo), 4h. (La Paz), 5h. (Hamburg and De Bilt), 6h. (Manila, Zi-ka-wei, Taihoku, and near Padova), 7h. (Helwan), 10h. (Manila), 11h. (Manila), 12h. (La Paz and near Manila), 13h. (De Bilt and Manila), 14h. (Helwan and Manila), 15h. (La Paz and Manila), 16h. (Helwan and Manila (2)), 17h. (De Bilt and Manila), 19h. (Manila), 20h. (De Bilt and Manila).

May 22d. 18h. 22m. 18s. Epicentre 18°·5N. 68°·0W (as on 1918 Oct. 25d.).

A = +·355, B = −·879, C = +·317; D = −·927, E = −·375; G = +·119, H = −·294, K = −·948.

The Epicentre might be moved about 1° further W. (to 69°·0W.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Porto Rico	E.	2·5	98	0 56	+17	—	—	1·4	2·0
	N.	2·5	98	0 56	+17	—	—	1·3	1·8
Port au Prince	N.E.	4·1	271	0 46	−18	1 15	−38	1·8	2·6
	N.W.	4·1	271	0 46	−18	1 11	−42	2·0	2·6
Washington		21·9	341	5 12	+ 8	9 4	+ 1	—	—
Chicago		28·6	329	—	—	e 10 52	−18	13·7	—
La Paz		35·0	180	7 22	+ 9	e 14 25	?SR$_1$	21·8	24·2
Tortosa		62·0	51	—	—	—	—	e 28·7	30·8
Uccle		64·7	41	—	—	—	—	—	30·7
De Bilt	E.	65·2	40	—	—	—	—	e 31·7	37·7
	N.	65·2	40	—	—	—	—	e 28·7	40·7
Hamburg		68·1	38	—	—	—	—	e 38·7	—

No additional readings.

May 22d. 21h. 23m. 16s. Epicentre 37°·0N. 28°·7E. (as on 1920 May 1d.).

A = +·700, B = +·383, C = +·602; D = +·480, E = −·877; G = +·528, H = +·289, K = −·799.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	4·0	286	e 0 59	− 3	i 1 49	− 1	i 2·2	2·5
Helwan	7·5	162	3 44	?L	—	—	(3·7)	—
Lemberg	13·2	347	—	—	—	—	e 8·9	—
Rocca di Papa	13·2	296	e 3 23	+ 7	e 5 54	+ 5	e 8·3	—
Vienna	14·4	325	—	—	—	—	8·7	—
Moncalieri	17·6	304	e 4 16	+ 4	—	—	$9·6_5$	—
Strasbourg	19·1	314	e 4 31	+ 1	—	—	10·7	—
Hamburg	21·0	328	—	—	—	—	e 12·7	—
Uccle	22·1	316	—	—	e 8 48?	−19	e 11·7	—
Tortosa	22·1	289	—	—	—	—	e 7·7	15·8
De Bilt	22·4	320	—	—	—	—	e 12·7	15·4
La Paz	105·2	261	60 50	?L	—	—	(60·8)	—

Additional readings: Athens gives also MN = +2·4m., T_e = 21h.23m.14s. Helwan PN = +5m.44s. Rocca di Papa e = +4m.10s., eL = +9·9m. De Bilt MN = +13·1m.

May 22d. 23h. 11m. 0s. Epicentre 36°·1N. 137°·3E. (as on 1920 July 3d.).

A = −·594, B = +·548, C = +·589.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	2·0	0 39	+ 8	0 50	− 5	1·4	1·4
Osaka	2·1	0 31	− 2	—	—	1·1	1·1
Mizusawa	4·3	1 17	+10	—	—	2·4	—

No additional readings.

May 22d. Readings also at 2h. (Manila), 3h. (near La Paz), 5h. (Hamburg), 8h. (Manila), 12h. (La Paz), 13h. (2) and 16h. (Manila), 18h. (Tortosa), 23h. (near Tokyo).

May 23d. 4h. 13m. 18s. Epicentre 12°·5N. 124°·5E. (as on May 21d.).

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 20	+18	—	—	2·4	3·0
Taihoku	12·8	348	e 4 13	+63	—	—	—	—
Zi-ka-wei	18·9	352	e 4 28	0	e 7 56	− 4	—	—
Nagasaki	20·9	13	5 4	+12	—	—	—	—
Osaka	24·3	22	5 29	− 2	9 53	+ 3	—	26·4
Batavia	25·6	224	5 52	+ 8	—	—	—	—
Tokyo	27·0	28	e 5 33	−25	—	—	—	—
Riverview	52·8	151	i 17 2	?S	(i 17 2)	+ 8	e 25·0	35·5
Melbourne	53·8	160	—	—	17 42	+36	—	42·7
Helwan	86·5	300	24 42	+?S	(24 42)	+66	—	—
De Bilt	97·1	327	—	—	e 24 24	−63	e 53·7	63·1
Uccle	98·2	326	—	—	e 26 12	+34	—	53·7
Edinburgh	99·0	333	—	—	—	—	—	72·7
Moncalieri	99·1	320	e 13 49	−17	—	—	e 41·0	—
Eskdalemuir	99·3	333	—	—	e 32 42	?SR_1	49·7	—
Kew	100·2	329	—	—	—	—	—	65·7
Tortosa	105·7	319	—	—	—	—	e 56·7	—
Coimbra	111·6	323	—	—	—	—	e 57·7	—
La Paz	167·1	110	e 20 36	[+23]	—	—	—	—

Additional readings: Manila gives also MN = +2·9m. Osaka MN = +20·4m. Riverview eS? = +21m.2s., MN = +32·6m. Helwan PN = +25m.42s. De Bilt eE = +26m.42s., MN = +55·9m. Zante (Δ = 110°·0) gives simply 4h. Coimbra reading has been increased by 1h.

May 23d. A series of shocks of which the initial wave is recorded below do not seem to have their origin at the usual seat of disturbance 43°·8N. 11°·2E. The stations are not sufficiently numerous to allow a trustworthy determination to be made.

Zurich	Padova	Besançon	Strasbourg	Pola	Vienna
h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
6 16 18					
6 17 28		6 17 48?	6 17 48	6 18 29	6 18 51
6 19 35					
6 24 48	6 24 17		6 24 59		6 26 34
14 50 34			14 51 37		

May 23d. Readings also at 2h. (Zante, near Athens, and near Manila (2)), 3h. (near Manila (2)), 4h. (La Paz), 5h. (near Colombo), 8h. (Manila), 11h. (La Paz), 12h. (Manila and near Tokyo), 14h. (Manila), 15h. (La Paz), 17h. (Taihoku), 20h. (La Paz), 21h. (near Mizusawa (3) and near Manila), 22h. (near Mizusawa).

May 24d. Readings at 1h. (near Zurich (2) and Strasbourg), 2h. (near Strasbourg and Zurich), 3h. (near Lick and near Mizusawa), 6h. (Taihoku and Helwan), 9h. (near Mizusawa), 11h. (Manila), 12h. (La Paz, Taihoku, Vera Cruz, near Oaxaca, and near Mizusawa), 15h. (La Paz), 17h. (Rocca di Papa and near Ootomari and Mizusawa), 21h. (La Paz), 22h. (Rocca di Papa).

May 25d. Readings at 0h. (Riverview), 1h. (near Manila), 2h. (De Bilt), 3h. (Colombo), 6h. (Taihoku), 9h. (Zi-ka-wei and near Manila), 10h. (Helwan), 12h. (Lemberg and Helwan), 15h. (Manila), 16h. (La Paz, Uccle, De Bilt, and Manila), 17h. (Manila and Helwan), 23h. (Helwan).

May 26d. 5h. 4m. 27s. Epicentre 39°·3N. 21°·0E. (as on 1919 Dec. 22d.).

A = +·722, B = +·277, C = +·633.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	2·6	120	e 0 40	− 1	e 1 13	+ 1	e 1·3	1·7
Mostar	4·7	331	e 1 3	−10	e 2 3	− 6	—	2·6
Pompeii	5·1	289	e 1 37	+18	—	—	—	—
Belgrade	5·5	356	e 1 15	−10	e 2 24	− 7	—	3·4
Rocca di Papa	6·8	294	e 1 21	−23	—	—	—	4·4
Uccle	16·4	320	—	—	—	—	e 9·0	—
De Bilt	16·8	325	—	—	—	—	e 9·2	—

Belgrade gives also eP = +1m.22s.

May 26d. Readings also at 0h. (Manila), 2h. (Vienna), 7h. and 8h. (Kobe), 11h. (De Bilt, Belgrade, Mostar, Rocca di Papa, and near Athens), 16h. (De Bilt), 17h. (La Paz), 22h. (near Mizusawa), 23h. (Manila and Kobe).

May 27d. Readings at 5h. (De Bilt), 6h. (Manila), 7h. (near Kobe and Osaka) 8h. (Taihoku), 13h. (Helwan (2) and La Paz), 15h. (Taihoku), 19h. (La Paz and near Osaka and Tokyo), 21h. (Manila).

May 28d. 19h. 18m. 56s. Epicentre 5°·2N. 129°·4E.

A = −·632, B = +·770, C = +·091; D = +·773, E = +·635;
G = −·058, H = +·070, K = −·996.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	12·5	319	3 13	+ 7	—	—	7·1	8·4
Batavia	25·2	243	5 40	0	—	—	e 18·1	—
Zi-ka-wei	27·0	345	e 5 52	− 6	e 10 39	− 2	—	—
Tokyo	31·7	17	—	—	e 11 4	−59	—	—
Riverview	44·2	153	—	—	e 15 8	+ 3	e 27·8	29·6
Sydney	44·2	153	18 58	?SR_1	—	—	26·5	30·6
Helwan	94·4	301	23 4	?S	(23 4)	−116	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria	97·4	40	40 6	?L	—	—	45·5	56·2
Hamburg	102·5	329	—	—	e 25 4	−76	e 52·1	60·1
Rocca di Papa	105·8	316	e 23 52	?	e 26 34	−16	55·6	—
De Bilt	105·8	328	—	—	e 25 14	−96	e 53·1	62·6
Strasbourg	106·1	323	—	—	—	—	e 53·1	56·1
Uccle	106·9	327	—	—	e 24 34	−146	e 50·1	65·1
Edinburgh	107·6	334	—	—	—	—	56·1	—
Moncalieri	107·8	321	e 18 34	?PR_1	28 28	+80	45·5	—
Eskdalemuir	108·0	334	—	—	e 25 24	−106	49·1	61·0
Stonyhurst	108·5	330	e 40 4	?L	—	—	(40·1)	—
Paris	108·9	326	—	—	e 28 4	+46	59·1	65·1
Oxford	109·2	330	—	—	—	—	—	66·1
Toronto	124·7	24	—	—	—	—	56·0?	—
La Paz	159·5	124	21 7 [+60]	—	—	—	91·1	—

Additional readings and notes: Manila gives also MN = +7·3m. Riverview eS? = +15m.41s., eSR_1 = +18m.46s., and +19m.6s. Helwan PN = +30m.4s. Hamburg MN = +58·1m. Rocca di Papa L = +66·6m. De Bilt MN = +57·8m. Epicentre 4°·7N. 132°·3E. Eskdalemuir eN = +34m.18s., MN = +58·5m. Paris M = +67·1m. Melbourne (Δ = 45°·4) gives P = 19h.15m.6s., PR_1 = 19h.19m.12s., S = 19h.23m.36s., L = 19h.34m.24s., M = 19h.38m.18s.

May 28d. 20h. 3m. 42s. Epicentre 48°·0N. 127°·5W.

A = −·407, B = −·531, C = +·743; D = −·793, E = +·609; G = −·452, H = −·590, K = −·669.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria		2·8	77	0 56	+12	—	—	1·6	2·9
	Z.	2·8	77	1 8	?S	(1 8)	− 9	1·8	2·0
Sitka	N.	10·2	335	e 2 11	−22	—	—	—	5·6
Berkeley		10·8	158	e 3 36	+55	—	—	—	11·3
Lick		11·5	156	—	—	—	—	e 7·3	—
St. Louis	E.	28·4	96	e 6 12	0	e 11 6	0	e 14·8	17·9
Chicago		28·6	88	6 21	+ 7	10 58	−12	14·3	—
Ann Arbor		30·9	85	—	—	—	—	19·2	—
Toronto		33·2	80	—	—	—	—	i 17·8	18·4
Ottawa		34·9	75	—	—	e 12 40	−14	e 16·8	18·7
Ithaca		35·6	80	—	—	e 16 48	?L	e 18·8	—
Honolulu	E.	36·2	234	—	—	—	—	e 16·8	18·7
	N.	36·2	234	—	—	—	—	e 16·7	18·0
Georgetown	E.	37·0	85	—	—	18 34	?L	e 19·8	20·2
	N.	37·0	85	e 15 7	?	18 27	?L	e 19·8	20·2
Washington		37·0	85	—	—	—	—	e 16·6	—
Cheltenham	E.	37·2	85	—	—	—	—	e 18·9	20·2
	N.	37·2	85	—	—	—	—	e 17·2	20·4
Northfield		37·4	75	—	—	—	—	e 18·3	—
Edinburgh		66·2	31	—	—	—	—	35·3	—
Eskdalemuir		66·6	31	—	—	e 19 44	− 1	41·3	—
Stonyhurst		68·0	32	—	—	—	—	—	39·3
Oxford		70·2	33	—	—	i 20 33	+ 5	—	41·1
De Bilt		72·0	28	—	—	e 20 50	0	e 36·3	44·2
Hamburg		72·2	26	e 11 40	+ 9	—	—	e 40·3	—
Uccle		72·9	30	—	—	—	—	e 32·3	—
Paris		74·0	32	e 11 56	+14	—	—	38·3	41·3
Strasbourg		75·9	29	12 4	+10	—	—	e 40·3	45·3
Moncalieri		80·0	37	—	—	—	—	e 42·3	48·4
La Paz		83·3	125	e 12 46	+ 8	—	—	63·3	67·8
Rocca di Papa		83·6	29	i 11 48	−52	—	—	—	—
Helwan		99·8	19	60 18	?L	—	—	(60·3)	—

Additional readings and notes: Victoria, all readings have been increased by 2m. Ann Arbor LN = +19·1m. Reading given as 22h. Toronto L = +32·7m. Ottawa eEV = +15m.13s. Cheltenham eE = +19m.36s., eN = +19m.40s. De Bilt MN = +43·7m. Helwan PN = +64m.18s.

May 28d. Readings also at 2h., 10h., and 16h. (La Paz).

May 29d. Readings at 11h. (La Paz), 12h. (Victoria and Helwan), 21h. (Tokyo, Manila, and Moncalieri).

May 30d. Readings at 4h. (Zi-ka-wei and near Manila), 5h. (De Bilt), 7h. (Helwan), 10h. (La Paz), 14h. (near Riverview), 15h. (Helwan), 18h. (Manila, La Paz, Taihoku, and Helwan), 20h. (near Tokyo), 22h. (La Paz and near Athens).

May 31d. Readings at 1h. (near Athens), 5h. (near Tacubaya), 6h. (near Mizusawa), 9h. (La Paz (2)), 11h. (Manila), 21h. (Riverview, Melbourne, Christchurch, and near Tokyo), 22h. (Manila and Christchurch).

June 1d. 19h. 35m. 38s. Epicentre 54°·0N. 156°·0E. (as on 1914 Mar. 18d.).
A = −·537, B = +·239, C = +·809; D = +·407, E = +·914;
G = −·739, H = +·329, K = −·588.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	18·0	220	4 36	+19	7 57	+17	—	—
Tokyo	21·6	218	e 5 3	+ 3	—	—	—	—
Manila	48·0	228	e 8 22	−32	—	—	—	—
Hamburg	68·8	340	e 11 10	0	i 20 13	+ 1	e 32·4	—
Eskdalemuir	69·4	348	—	—	i 20 15	− 4	—	—
De Bilt	71·2	341	—	—	i 20 40	0	e 33·4	—
Uccle	72·5	341	—	—	e 20 22	−34	—	51·4
Batavia	72·8	232	—	—	e 20 53	− 7	—	21·2
Strasbourg	74·0	338	e 11 43	+ 1	(e 21 12)	− 2	e 21·2	—
Tortosa	82·9	341	12 24	−11	22 44	−12	—	—
Helwan	83·5	314	23 22	?S	(23 22)	+19	—	—

Additional readings: Mizusawa gives also PN = +4m.32s. De Bilt e = +21m.20s.

June 1d. Readings also at 1h. (La Paz), 8h. (Riverview, Manila, and Melbourne), 9h. (Cape Town, Perth, and De Bilt), 12h. (Manila), 13h. (De Bilt), 14h. (near Balboa Heights), 16h. (Manila and Rocca di Papa), 17h. (La Paz), 19h. (La Paz and Budapest), 22h. (Zi-ka-wei).

June 2d. 7h. 6m. 20s. Epicentre 11°·0S. 97°·0E.
A = −·120, B = +·974, C = −·191; D = +·993, E = +·122;
G = +·023, H = −·189, K = −·982.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia		10·8	64	e 2 58	+17	e 5 7	+17	—	8·1
Colombo		24·8	316	—	—	—	—	10·7	16·7
Perth		27·2	143	18 40	?L	—	—	(18·7)	—
Kodaikanal		28·8	317	11 16	?S	(11 16)	+ 3	13·9	15·2
Manila		34·9	44	7 3	− 9	12 45	− 9	17·0	22·5
Taihoku		43·2	34	—	—	—	—	e 18·7	—
Melbourne		50·4	131	—	—	—	—	—	43·7
Riverview		54·3	126	—	—	e 29 4	?L	e 32·5	39·0
Rocca di Papa	E.	93·1	312	i 13 26	− 7	i 24 34	−12	—	—
	N.	93·1	312	i 14 4	+31	i 24 20	−26	—	—
Hamburg		97·1	324	e 13 53	− 2	e 24 45	−42	e 49·7	—
De Bilt		99·8	322	—	—	25 11	−43	e 51·7	66·6
Eskdalemuir		104·9	325	—	—	e 25 54	−47	48·7	—
La Paz		148·8	208	78 5	?L	—	—	(78·1)	—

Additional readings: Colombo gives also P = 7h.4m.0s. Manila PR_1E = +7m.53s., PR_2N = +7m.57s., PR_1E = +8m.54s., PR_2N = +8m.35s., SR_1E = +14m.50s., SR_1N = +14m.33s., SR_2E = +15m.44s., SR_2N = +15m.11s., MN = +22·7m. Riverview MN = +39·5m. De Bilt MN = +66·0m.

June 2d. Readings also at 2h. (La Paz), 6h. (Rocca di Papa and Zi-ka-wei), 12h. and 16h. (La Paz), 19h. (near Athens (2)).

June 3d. Readings at 3h. (Kobe), 4h. (Manila and Batavia), 6h. (near Tokyo), 12h. (Mizusawa and near Tokyo).

June 4d. Readings at 1h. (Chicago, Ann Arbor, Georgetown, Ottawa, Victoria, and Toronto), 2h. (De Bilt), 4h. (Melbourne and Riverview), 5h. (Helwan), 6h. (near Rocca di Papa), 13h. (Helwan), 14h. (near Mizusawa), 16h. (Batavia, Manila, and Lemberg), 17h. (Uccle, De Bilt, and Helwan), 19h. (near Simla).

June 5d. Readings at 1h. (Riverview), 2h. (Rocca di Papa), 3h. (Taihoku), 8h. (La Paz), 10h. (Manila and Helwan), 11h. (La Paz (2)), 18h. (Riverview and Melbourne), 19h. (Stonyhurst, Eskdalemuir, Kew, Helwan, and De Bilt), 20h. (near Tokyo), 23h. (Melbourne).

June 6d. 0h. 9m. 15s. Epicentre 6°·0N. 83°·0W. (as on 1920 Sept. 24d.).

$A = +\cdot121$, $B = -\cdot987$, $C = +\cdot104$; $D = -\cdot993$, $E = -\cdot122$; $G = +\cdot013$, $H = -\cdot104$, $K = -\cdot994$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights	E.	4·5	49	1 29	+19	2 3	− 1	2·2	2·2
	N.	4·5	49	1 21	+11	1 57	− 7	2·1	2·1
La Paz		26·8	147	5 56	0	10 33	− 4	13·8	17·5
De Bilt	E.	84·2	40	—	—	—	—	e 42·8	43·6

No additional readings.

June 6d. Readings also at 10h. (Helwan), 16h. (Tortosa), 23h. (Christchurch).

June 7d. Readings at 0h. (La Paz), 4h. (Manila and Batavia), 8h. (Tortosa), 9h (La Paz), 11h. (Strasbourg), 14h. (Manila), 15h. (Helwan and near Mizusawa), 16h. (Manila), 19h. (La Paz).

June 8d. Readings at 4h. (La Paz), 5h. (Helwan and De Bilt), 8h. and 14h. (Helwan), 15h. (near Batavia), 17h. (La Paz).

June 9d. 10h. 34m. 50s. Epicentre 5°·6N. 126°·3E. (as on 1918 Feb. 27d.).

$A = -\cdot589$, $B = +\cdot802$, $C = +\cdot098$; $D = +\cdot806$, $E = +\cdot592$; $G = -\cdot058$, $H = +\cdot079$, $K = -\cdot995$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	10·4	330	e 2 38	+ 2	—	—	4·2	5·8
Batavia	22·8	239	5 15	0	1 9 19	− 2	e 12·2	—
Zi-ka-wei	25·9	350	e 5 44	− 3	e 10 16	− 4	—	—
Helwan	91·5	300	45 10	?L	—	—	(45·2)	—
La Paz	162·2	129	20 24	[+15]	—	—	21·2	—

Additional readings: Manila gives also MN = +6·5m. Helwan PN = +43m.10s.

June 9d. Readings also at 1h. (near Tokyo and Mizusawa), 2h. (near Tokyo), 10h. (La Paz), 21h. and 22h. (near Tokyo), 23h. (near Oaxaca).

June 10d. 1h. 10m. 30s. Epicentre 39°·3N. 21°·0E. (as on May 26d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	2·6	120	0 41	0	(1 5)	− 7	1·1	1·2
Belgrade	5·5	356	e 2 2	+37	e 3 56	?L	(e 3·9)	4·0
Rocca di Papa	6·8	294	—	—	e 2 42	−23	e 6·0	7·6
Helwan	12·7	135	10 30	?L	—	—	(10·5)	—
Hamburg	16·1	336	—	—	—	—	e 10·5	—
De Bilt	16·8	325	—	—	—	—	e 10·8	11·3

Helwan gives also PN = +9m.30s.

June 10d. Readings also at 2h. (Manila), 3h. (La Paz), 11h. (Nagasaki), 12h. (La Paz and Helwan), 17h. (Manila), 18h. (near Tacubaya, Oaxaca, and Vera Cruz), 19h. (Manila).

June 11d. Readings at 1h. and 2h. (La Paz), 5h. (Helwan), 11h. (Nagasaki), 19h. (Manila).

June 12d. Readings at 0h. (near Nagasaki), 1h. (near Port au Prince), 2h. (La Paz), 3h. (near Berkeley and Lick), 19h. (Tokyo and La Paz), 23h. (Batavia and Riverview).

June 13d. Readings at 3h. (Vera Cruz and near Tacubaya), 6h. (Manila), 7h. (La Paz), 12h. (Taihoku), 15h. (Helwan), 16h. (Manila (2) and Wellington), 17h. (Budapest, Belgrade, and near Athens), 21h. (Pompeii and Rocca di Papa).

June 14d. 1h. 41m. 55s. Epicentre 48°·0N. 35°·0E.

A = +·548, B = +·384, C = +·743; D = +·574, E = −·819;
G = +·609, H = +·426, K = −·669.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Lemberg	7·4	288	—	—	—	—	e 6·0	7·6
Budapest	10·7	273	e 1 5	?	—	—	—	6·1
Vienna	12·4	278	—	—	—	—	e 6·1	7·6
Pola	14·8	266	e 6 21	?S	(e 6 21)	− 6	e 6·9	—
Hamburg	16·7	299	e 4 5	+ 4	—	—	—	—
Rocca di Papa	16·9	257	—	—	—	—	e 5·7	—
Strasbourg	18·1	282	e 4 7	−11	—	—	9·1	—
Helwan	18·4	190	7 5	?S	(7 5)	−44	(10·1)	—
De Bilt	19·5	293	—	—	8 24	+11	10·3	11·4
Uccle	20·0	290	e 4 41	0	e 8 23	0	e 10·4	11·5
Paris	21·4	284	—	—	—	—	e 10·9	11·1
Oxford	23·4	293	—	—	—	—	—	14·8
Stonyhurst	24·0	298	14 23	?L	—	—	(14·4)	—
Edinburgh	24·5	303	—	—	10 5	+11	—	—

Additional readings: Rocca di Papa gives also eL = +12·8m. De Bilt eN = +3m.57s. Belgrade (Δ = 10°·5 Az. = 258°·0) gives eP = 1h.37m.45s., eS = 1h.43m.3s., eL = 1h.44m.56s., M = 1h.45m.59s. Apparently the time is in error.

June 14d. 4h. 47m. 0s. Epicentre 37°·5N. 142°·5E. (as on 1918 Aug. 25d.).

A = −·630, B = +·483, C = +·609.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	2·0	327	0 32	+ 1	0 58	+ 3	—	—
Mito	2·0	236	0 26	− 5	(0 40)	−15	0·7	1·0
Tokyo	2·9	231	0 41	− 4	1 8	−12	1·5	2·6
Numadu	3·3	244	e 0 58	+ 6	—	—	1·7	—
Hakodate	4·5	343	2 19	?L	2 48	?	3·1	3·4
Osaka	6·3	248	2 23	+47	(2 23)	−29	3·3	4·1

Additional readings: Tokyo gives also MN = +2·7m. Hakodate MN = +3·6m.

June 14d. 8h. 44m. 38s. Epicentre 37°·8N. 117°·3E.

A = −·362, B = +·702, C = +·613; D = +·889, E = +·459;
G = −·281, H = +·545, K = −·790.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo		18·3	90	e 4 16	− 5	—	—	—	—
Mizusawa	E.	18·6	79	4 25	+ 1	7 53	0	—	—
Manila		23·5	171	e 5 24	+ 1	—	—	—	—
Victoria		78·4	36	—	—	—	—	36·9	40·5
Toronto		97·2	12	—	—	—	—	—	40·3
La Paz		158·2	14	1 19 59	[− 7]	—	—	—	—

Mizusawa gives also PN = +4m.22s.

June 14d. Readings also at 0h. (Batavia), 1h. (Athens), 6h. and 7h. (near Batavia), 19h. (Manila), 21h. (Athens and near La Paz (3)).

June 15d. Readings at 9h. (Manila), 16h. (near Mostar), 17h. (Vera Cruz (2) and Tacubaya (4)), 18h. (Vera Cruz and Tacubaya), 19h. (Chicago, Ottawa, Georgetown, and near Tacubaya and Vera Cruz), 20h. (La Paz), 21h. (near Puebla), 22h. (Vera Cruz and near Tacubaya), 23h. (Vera Cruz).

June 16d. 9h. 4m. 52s. Epicentre 65°·0S. 0°·0 (as on 1917 July 15d.).

A = +·423, B = ·000, C = −·906; D = ·000, E = −1·000;
G = −·906, H = ·000, K = −·423.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz	65·9	283	e 10 52	+ 2	e 19 35	− 1	30·7	33·4
Helwan	97·9	27	29 8	?S	(29 8)	?SR_1	—	—
Uccle	115·8	4	—	—	e 30 14	+118	e 55·1	62·1
Manila	116·0	113	—	—	e 26 8	−130	—	—
Kew	116·5	0	—	—	—	—	—	53·1
De Bilt	117·1	3	—	—	—	—	e 57·1	62·6
Eskdalemuir	120·3	358	—	—	—	—	58·1	—

Additional readings: Helwan gives also PN = +31m.8s.(?SR_1N). De Bilt MN = +64·4m.

June 16d. Readings also at 14h. (near Mostar).

June 17d. 8h. 10m. 0s. I
10h. 19m. 30s. II } Epicentre 30°·0N. 114°·0W.

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.
I Tucson	E.	3·5	50	0 56	+ 1	1 36	− 1	1·8	2·4
I	N.	3·5	50	—	—	1 41	+ 4	1·8	2·1
II	E.	3·5	50	e 1 17	+22	—	—	1·8	1·9
II	N.	3·5	50	0 49	− 6	—	—	1·6	1·8
I Berkeley	E.	10·5	321	e 2 41	+ 4	—	—	i 5·0	6·8
I	N.	10·5	321	e 3 1	+24	—	—	i 5·0	6·2
II	N.	10·5	321	e 2 44	+ 7	—	—	—	4·5
I Victoria		19·7	342	—	—	—	—	9·2	10·6
II		19·7	342	—	—	—	—	9·0	—
I Chicago		24·2	54	12 5	?L	—	—	(12·1)	—
II		24·2	54	e 6 30	+60	—	—	—	—
II Toronto		30·6	52	—	—	(11 24)	−20	11·4	11·6
I Georgetown	E.	31·5	63	—	—	e 16 0	?L	19·6	—
II	N.	31·5	63	—	—	e 15 28	?L	e 18·0	—
I Washington		31·5	63	—	—	—	—	e 15·8	—
II		31·5	63	—	—	—	—	e 15·3	—
I Ithaca		32·4	58	—	—	—	—	e 16·0	—
I Ottawa		33·5	52	e 15 12	?L	—	—	19·4	—
II		33·5	52	i 16 21	?L	—	—	18·9	—
I Honolulu	E.	40·4	268	—	—	—	—	e 17·8	20·9
I	N.	40·4	268	—	—	—	—	e 17·6	18·8
I De Bilt		82·2	33	—	—	—	—	e 44·0	48·4

Additional readings: I Berkeley iN = +3m.45s. II Berkeley eE = +3m.11s.
I Georgetown eN = +15m.55s. II Georgetown eE = +15m.30s.
I Ottawa i = +16m.44s. II Ottawa eE = +16m.30s.

June 17d. Readings also at 19h. (near Algiers), 23h. (Helwan).

June 18d. Readings at 1h. (near Manila), 3h. (La Paz), 8h. (near Manila), 15h. (Kodaikanal and near Batavia), 23h. (near La Paz, Mizusawa, and near Tokyo).

June 19d. Readings at 0h. (near Colombo), 2h. (Rocca di Papa and Uccle), 4h. and 9h. (near Batavia), 12h. and 16h. (near Tokyo), 19h. (Taihoku), 23h. (La Paz).

June 20d. Readings at 0h. (Helwan, Uccle, De Bilt, and La Paz), 2h. (Kodaikanal), 13h. (Manila), 18h. (La Paz), 19h. (La Paz and Rio Tinto).

June 21d. Readings at 3h. (Edinburgh and near Mizusawa), 4h. (Colombo, Melbourne, and Taihoku), 7h. (near Rocca di Papa), 8h. (Tokyo), 10h. (Kodaikanal), 11h. (near Tokyo), 12h. and 13h. (Kodaikanal), 17h. (La Paz), 23h. (Nagasaki).

June 22d. 11h. 23m. 16s. Epicentre 43°·0N. 142°·5E.

A = −·580, B = +·445, C = +·682; D = +·609, E = +·793;
G = −·541, H = +·415, K = −·731.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hakodate		1·8	226	−0 1	−29	—	—	0·5	0·6
Ootomari		3·7	3	1 0	+ 2	—	—	1·4	—
Mizusawa	E.	4·0	195	1 0	− 2	1 47	− 3	—	—
Mito		6·8	194	1 39	− 5	(2 56)	− 9	2·9	—
Tyosi		7·4	190	1 54	+ 2	(3 10)	−11	3·2	4·3

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	7·6	197	1 36	−19	2 20	−66	3·6	4·8
Osaka	10·0	215	3 31	+61	—	—	5·2	6·2
Zi-ka-wei	20·5	242	e 4 47	0	e 8 35	+ 1	—	—
Hamburg	75·2	333	e 11 44	− 6	—	—	e 36·7	—
Eskdalemuir	77·4	341	12 3	0	e 21 52	− 1	40·7	—
Uccle	79·4	335	—	—	e 22 8	− 8	39·7	50·7
Strasbourg	80·2	331	e 12 13	− 7	—	—	45·7	—
Helwan	83·6	306	22 44	?S	(22 44)	−21	—	—

Additional readings and notes : Mizusawa gives also PN = +1m.2s. Osaka MN = +6·4m. Eskdalemuir eS has been corrected by +10m. Helwan PN = +23m.44s.

June 22d. Readings also at 6h. and 7h. (2) (La Paz), 17h. (Taihoku and La Paz), 18h. and 19h. (Rio Tinto).

June 23d. 10h. 34m. 18s. I } Epicentre 28°·0N. 130°·0E.
18h. 21m. 15s. II }

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Nagasaki	4·7	359	1 14	+ 1	(2 10)	+ 1	2·2	—
II		4·7	359	1 29	+16	(2 35)	+26	2·6	3·3
I	Osaka	8·1	33	3 47	?L	—	—	(3·8)	7·2
II		8·1	33	2 44	+41	—	—	5·3	6·9
I	Zi-ka-wei	8·1	295	e 2 8	+ 5	—	—	—	4·3
II		8·1	295	e 2 0	− 3	e 3 40	0	—	6·5
I	Taihoku	8·1	250	e 1 51	−12	—	—	—	—
II		8·1	250	e 2 12	+ 9	—	—	4·4	—
II	Tokyo	11·2	45	e 3 17	+30	e 4 32	−27	e 6·4	7·7
II	Mizusawa N.	14·4	37	3 43	+11	6 33	+15	—	—
I	Manila	15·9	214	—	—	—	—	e 6·7	—
II		15·9	214	e 4 5	+14	—	—	7·2	—
II	Ootomari	21·1	25	5 1	+ 7	—	—	10·0	14·0
II	Budapest	82·4	320	—	—	—	—	53·8	—
II	Helwan	83·2	300	48 45	?L	—	—	(48·8)	—
II	Vienna	83·4	323	—	—	—	—	e 48·8	55·8
II	Hamburg	83·4	329	—	—	—	—	e 43·8	47·8
I	De Bilt	86·6	329	—	—	—	—	e 47·7	50·2
II		86·6	329	—	—	e 23 20	−17	e 44·8	50·8
II	Strasbourg	87·7	325	—	—	—	—	e 46·8	48·6
I	Uccle	87·8	329	—	—	—	—	—	48·7
II		87·8	329	—	—	e 33 45	?	e 45·8	49·8
II	Rocca di Papa	89·4	319	i 28 9	?SR_1	—	—	e 48·2	50·8
II	Besançon	89·5	324	—	—	—	—	47·8	—
II	Oxford	89·6	331	—	—	—	—	47·7	51·4
II	Moncalieri	90·2	323	—	—	e 28 7	?SR_1	40·8	—
II	Tortosa	96·8	324	e 30 45	?SR_1	—	—	50·8	55·5
II	Coimbra E.	101·6	328	e 20 40	?	—	—	51·8	56·7
II	N.	101·6	328	e 16 40	?	30 10	?SR_1	—	56·0

Additional readings and notes : II Nagasaki gives also MN = +3·4m. II Osaka MN = +7·2m. I Zi-ka-wei MN = +3·9m. II Zi-ka-wei MN = +4·2m. II Mizusawa PE = +3m.44s. II Helwan PN = +47m.45s. (?LN). II Hamburg MN = +48·6m. II De Bilt MN = +50·9m. II Rocca di Papa iP has been corrected by +1h.

June 23d. Readings also at 1h. (Zi-ka-wei (2)), 2h. (Uccle, Zi-ka-wei (2), and De Bilt), 6h. (near Zi-ka-wei), 7h. (De Bilt), 11h. and 13h. (Zi-ka-wei), 14h. (Uccle, De Bilt, Zi-ka-wei, and Manila), 15h. (Manila, Zi-ka-wei, and La Paz), 16h. (De Bilt).

June 24d. Readings at 0h. (Manila), 4h. (Zi-ka-wei), 6h. (La Paz), 11h. and 19h. (Zi-ka-wei), 21h. (near Taihoku).

June 25d. 2h. 5m. 36s. Epicentre 49°·0N. 124°·0W. (as on 1919 Oct. 10d.).

A = −·367, B = −·544, C = +·755; D = −·829, E = +·559;
G = −·422, H = −·626, K = −·656.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria		0·8	141	—	—	—	—	−0·1	1·8
Berkeley		11·2	173	—	—	e 3 58	−61	e 5·4	9·3
Lick	E.	12·1	171	—	—	—	—	e 5·6	8·6
Chicago		26·3	92	10 39	?S	(10 39)	+11	(16·1)	—
Toronto		30·8	82	—	—	e 11 24	−24	e 18·4	21·7
Ottawa		32·5	78	—	—	e 12 18	+ 2	e 18·0	—
Ithaca		33·2	82	—	—	e 19 12	?	22·8	—
Georgetown		34·7	89	—	—	e 10 16	−155	e 19·6	—
Washington		34·7	89	—	—	—	—	e 20·2	—
Cheltenham	E.	34·9	89	—	—	—	—	i 19·9	23·1
Honolulu	N.	38·6	236	10 16	?PR_1	13 53	+ 7	14·7	17·8
Edinburgh		64·1	33	—	—	—	—	31·4	37·4
Eskdalemuir		64·6	32	—	—	e 19 14	− 6	30·4	—
Oxford		68·1	35	—	—	—	—	36·8	40·8
Kew		68·7	35	—	—	—	—	—	39·4
De Bilt	E.	70·1	29	—	—	e 20 19	− 8	e 33·4	38·1
Uccle		70·9	31	—	—	e 20 24	−13	e 32·4	—
Paris		71·9	34	—	—	—	—	e 40·4	—
Moncalieri		77·0	32	—	—	e 21 53	+ 4	40·0	—
Tortosa		77·8	40	—	—	—	—	e 42·4	47·5

Additional readings: Toronto gives also eL = +20·8m. Ottawa L = +31·9m. Georgetown eLN = +19·4m., LE = +23·1m., LN = +22·4m. Cheltenham eE = +22m.55s., eN = +23m.3s., MN = +23·6m. Honolulu ME = +17·1m. Eskdalemuir eE = +26m.40s. De Bilt eLN = +35·4m.

June 25d. 15h. 31m. 6s. Epicentre 37°·5N. 134°·5E.

A = −·556, B = +·566, C = +·609; D = +·713, E = +·701;
G = −·427, H = +·434, K = −·793.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Osaka		2·9	165	0 48	+ 3	(1 22)	+ 2	1·4	1·8
Tokyo		4·8	113	e 2 22	?L	—	—	(e 2·4)	2·7
Mizusawa	E.	5·4	71	1 23	0	2 29	+ 1	—	—
Manila		25·9	211	e 12 4	?S	(e 12 4)	+104	15·3	—
Batavia	E.	50·7	217	—	—	i 15 45	−42	—	—

Additional readings: Mizusawa gives also SN = +2m.30s. Batavia i = +14m.13s., iE = +15m. 42s.

June 25d. Readings also at 4h. (Helwan), 7h. (De Bilt and Taihoku), 11h. (Vienna, Rocca di Papa, De Bilt, Edinburgh, Hamburg, Helwan, Uccle, and Pompeii), 12h. (Kodaikanal and Eskdalemuir), 14h. (near Kobe), 15h. (Helwan and near Mizusawa), 20h. (La Paz and Rio Tinto).

June 26d. 3h. 40m. 38s. Epicentre 39°·3N. 21°·0E. (as on June 10d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		2·6	120	1 6	+25	1 40	+28	1·8	2·0
Mostar		4·7	331	i 1 11	− 2	i 2 17	+ 8	—	3·0
Sarajevo		4·9	339	e 1 44	+28	2 39	+25	—	3·6
Pompeii	E.	5·2	288	1 29	+ 9	2 51	?L	(2·8)	3·9
Sinj		5·5	326	1 47	+22	2 37	+ 6	—	3·3
Belgrade		5·5	356	1 29	+ 4	3 10	?L	(3·2)	3·6
Rocca di Papa		6·8	294	i 1 44	0	3 38	+33	—	4·5
Pola		7·6	319	e 1 56	+ 1	(e 3 12)	−14	3·2	5·2
Budapest		8·3	351	e 1 31	−35	e 4 45	?L	(4·8)	—
Florence		8·5	305	2 19	+10	—	—	—	6·5
Padova		9·1	315	2 21	+ 3	—	—	—	5·0

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Vienna	9·4	341	2 20	− 2	4 25	+12	i 5·4	6·6
Lemberg	10·7	11	—	—	e 4 46	− 2	e 5·7	6·5
Moncalieri	11·3	305	e 3 5	+16	5 42	+40	7·2	8·9
Zurich	12·1	316	e 2 54	− 6	e 5 15	− 6	—	—
Helwan	12·7	135	7 22	?L	—	—	(7·4)	—
Strasbourg	13·3	319	e 3 9	− 8	e 5 44	− 7	e 6·7	8·0
Besançon	13·4	311	5 25	?S	(5 25)	−28	(8·2)	10·4
Algiers	14·3	266	e 3 35	+ 5	e 6 23	+ 8	10·9	—
Tortosa	15·7	283	3 45	− 3	—	—	9·2	11·0
Hamburg	16·1	336	e 3 56	+ 3	—	—	8·4	11·6
Paris	16·2	312	e 3 57	+ 2	e 7 4	+ 4	9·4	9·4
Uccle	16·4	320	e 3 58	+ 1	e 6 58	− 6	8·6	10·5
De Bilt	16·8	325	4 10	+ 8	7 19	+ 6	8·4	11·7
Kew	19·1	315	—	—	—	—	—	15·4
Oxford	19·8	316	4 38	− 1	8 17	− 2	11·2	13·8
Coimbra	22·5	281	5 12	+ 1	9 13	− 2	e 12·2	14·3
Eskdalemuir	22·7	323	—	—	i 9 13	− 6	13·4	—
Edinburgh	23·0	324	—	—	9 22	− 3	—	17·9
Taihoku	81·9	64	14 58	?PR_1	—	—	—	—

Additional readings and notes: Athens gives also P = +1m.10s., MN = +2·4m., T_0 = 3h.40m.59s. Rocca di Papa PR_1 = +2m.10s. Pola MN = +4·7m. Budapest readings are given as at 2h. Florence P = +2m.12s.?, S = +7m.22s.? Vienna eLN = +5·1m. Helwan PN = +8m.22s. Hamburg MNZ = +11·5m. De Bilt MN = +11·2m.

June 26d. Readings also at 2h. (Melbourne), 6h. (Taihoku), 10h. (Helwan and La Paz), 11h. (La Paz), 16h. (near Mizusawa (2) and Tokyo).

June 27d. Readings at 3h. (Helwan), 9h. (Taihoku), 22h. (near Mizusawa).

1921. June 28d. 13h. 58m. 48s. Epicentre 37°·0S. 175°·0E.

A = −·795, B = +·070, C = −·602; D = +·087, E = +·996; G = +·600, H = −·052, K = −·799.

Very rough determination. Neither of the suggested origins (Riverview 39°·8S., 177°·4E., and Apia 40°·0S., 178°·0E.) suit the observations.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington		4·3	182	i 0 48	−19	—	—	—	1·2
Christchurch		6·7	195	1 12	−30	2 0	−62	—	4·2
Riverview		19·6	272	i 4 41	+ 5	i 8 33	+18	e 10·1	13·0
Sydney		19·6	272	(4 30)	− 6	(8 36)	+21	8·6	9·5
Melbourne		23·8	259	(5 18)	− 8	(8 0)	?	8·0	11·0
Apia		26·0	30	i 5 43	− 5	10 10	−12	12·6	—
Adelaide		29·3	263	e 6 12	− 9	i 11 12	−10	e 12·2	13·1
Perth		48·2	259	8 53	− 2	15 41	−15	—	—
Honolulu	N.	63·7	29	e 10 35	− 1	e 19 82	+23	—	—
Batavia		68·8	278	11 7	− 3	i 20 9	− 3	e 34·4	37·3
Manila		72·4	306	e 11 34	+ 2	(20 56)	+ 1	20·9	21·1
Tokyo		79·8	332	e 11 32	−46	—	—	—	—
Mizusawa	E.	82·2	335	12 28	+ 3	15 44	?PR_1	—	—
	N.	82·2	335	12 23	− 8	15 28	?PR_1	—	—
Berkeley		94·6	45	—	—	e 24 16	−46	—	—
Colombo		98·2	273	26 12	?S	(26 12)	+34	—	28·2
La Paz		100·1	120	14 8	− 3	i 24 35	−82	47·8	57·1
Victoria		101·5	37	17 45	?PR_1	26 7	− 3	36·9	51·7
Kodaikanal		102·1	275	26 6	?S	(26 6)	−10	62·0	68·1
Chicago		118·6	58	19 50	?PR_1	29 47	+68	55·9	—
Georgetown	E.	124·8	66	—	—	—	—	e 71·2	—
Toronto		124·9	59	—	—	e 38 12	?SR_1	55·2	—
Ottawa		127·9	58	e 18 57	[−17]	—	—	56·2	—
Helwan		149·0	270	21 12	?PR_1	(26 12)	?	—	—
Budapest		159·5	308	e 24 12	?PR_1	—	—	—	—
Hamburg		160·5	333	e 19 53	[−15]	—	—	e 76·2	83·2

Continued on next page.

	Δ	Az.	P.	O−C.	S	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Vienna	160·8	313	i 19 53	[−16]	e 35 12	?	e 55·2	93·2
Edinburgh	161·1	357	e 20 48	[+39]	—	—	—	52·0
Eskdalemuir	161·7	357	19 53	[−16]	—	—	—	81·9
Stonyhurst	163·1	355	20 24	[+14]	—	—	—	47·2
De Bilt	163·3	338	e 20 57	[+47]	—	—	e 70·2	88·0
Pompeii E.	164·4	290	20 12	[+ 1]	26 12	?PR_1	—	—
Uccle	164·7	337	e 20 5	[− 7]	e 35 6	?	—	—
Oxford	165·0	351	—	—	i 34 12	—	—	89·7
Strasbourg	165·2	325	21 4	[+52]	e 24 52	?PR_1	e 78·2	—
Kew	165·2	348	—	—	—	—	—	59·2
Rocca di Papa	165·5	295	e 19 42	[−30]	—	—	—	50·5
Paris	167·0	338	i 20 0	[−13]	—	—	73·2	81·2
Besançon	167·0	325	19 52?	[−21]	—	—	—	—
Moncalieri	167·6	314	19 50	[−24]	29 0	?	53·5	—
Barcelona	172·9	311	—	—	31 21	?	—	45·2
Algiers	173·5	271	20 5	[−11]	29 49	?	e 42·2	93·2
Tortosa	174·3	314	20 3	[−13]	31 32	?	54·9	93·3
Coimbra	175·9	38	21 39	[+82]	32 33	?	e 76·2	—
Rio Tinto	178·6	59	25 12	?PR_1	—	—	(82·2)	105·2
Granada	178·8	279	21 13	[+56]	i 33 28	?	—	—

Additional readings and notes: Christchurch gives also $PR_1 = +1$m.36s. Riverview i = +4m.46s., +4m.53s., and +4m.56s., $PR_1 = +5$m.7s., $PR_2 = +5$m.23s., $PR_3 = +5$m.35s., $PR_4 = +5$m.44s., PS = +8m.50s., $SR_1 = +9$m.16s., $SR_2 = +9$m.34s., MZ = +13·2m., MN = +14·6m., $T_o = +13$h.58m.29s. Epicentre 39°·8S., 177°·4E. Melbourne P = +0m.30s., $SR_1 = +5$m.54s. Adelaide i = +6m.42s., +7m.12s., +7m.42s., +10m.48s., i = +14m.6s., +15m.12s., and +16m.24s. Batavia i = +12m.20s. and +20m.54s. Manila S = +17m.10s., MN = +21·0m. La Paz i = +18m.6s., $T_o =$ 14h.0m.26s. Georgetown eLN = +71·8m., both these readings increased by 1h. Toronto e = +41m.12s., L = +66·0m. Ottawa iNV = +21m.1s., iV = +22m.1s., eL? = +30·9m. Budapest gives its readings as at 4h. instead of 14h. Hamburg iZ = +20m.43s., MN = +86·2m. Vienna iZ = +20m.44s. and +24m.33s. Eskdalemuir iZ = +20m.46s. = eN, PR_1? = +24m.27s. De Bilt ePR_1 = +24m.43s., MN = +94·6m. Uccle $PR_1 = +24$m.47s. Rocca di Papa iE = +20m.0s. (O−C. = −12s.), ePV = +20m.16s., P = +20m.6s. Paris $PR_1 = +25$m.1s. Coimbra eL = +46m.12s.(?SR_1), $T_o =$14h.7m.30s.

June 28d. Readings also at 12h. (Helwan), 17h. and 22h. (La Paz).

June 29d. 11h. 37m. 50s. Epicentre 43°·0N. 44°·0E.

A = +·526, B = +·508, C = +·682; D = +·695, E = −·719; G = +·491, H = +·474, K = −·731.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Lemberg	15·3	303	i 6 41	?S	(i 6 41)	+ 2	(e 9·5)	10·2
Helwan	16·6	222	7 10	?S	(7 10)	+ 1	(10·2)	—
Belgrade	17·0	284	4 9	+ 4	9 22	?L	e 11·5	11·9
Budapest	18·0	293	—	—	e 9 49	?L	e 11·7	—
Vienna	19·9	295	4 42	+ 2	i 8 23	+ 2	i 11·0	12·2
Pola	21·6	285	e 8 25	?S	(e 8 25)	−32	e 12·5	18·1
Rocca di Papa	23·0	278	e 5 16	− 1	9 22	− 3	16·0	16·2
Hamburg	24·7	307	e 5 33	− 2	e 9 48	− 9	e 13·0	14·6
Zurich	25·1	292	e 5 37	− 2	—	—	—	—
Strasbourg	25·6	295	e 5 40	− 4	e 10 10	− 4	e 13·7	—
Moncalieri	26·0	287	e 6 26	+38	10 19	− 3	e 13·7	—
Besançon	26·9	292	14 45	?L	—	—	(14·8)	17·2
De Bilt E.	27·4	303	e 6 0	− 2	e 10 46	− 2	14·6	16·9
N.	27·4	303	—	—	—	—	13·8	16·8
Uccle	27·8	300	e 6 3	− 3	e 10 52	− 3	e 13·2	—
Paris	29·1	296	—	—	—	—	e 15·7	20·2
Edinburgh	32·5	310	—	—	—	—	e 14·2	24·2
Eskdalemuir	32·5	309	—	—	e 10 53	−83	15·7	21·2
Coimbra	38·7	284	e 6 30	−74	—	—	e 21·2	—

Additional readings: Pola gives also MN = +16·6m. Rocca di Papa e = +5m.28s. Hamburg MZ = +14·3m., MN = +17·3m. Paris MN = +15·2m.

June 29d. Readings also at 4h. (Manila), 6h., 15h., and 16h. (La Paz), 18h. (Manila), 20h. (near Pompeii and Rocca di Papa), 23h. (Stonyhurst, Edinburgh, De Bilt, and near Port au Prince).

June 30d. 2h. 10m. 3s. Epicentre 61°·5N. 33°·5W.

$A = +·398$, $B = -·263$, $C = +·879$; $D = -·552$, $E = -·834$; $G = +·733$, $H = -·485$, $K = -·477$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Dyce N.	16·4	91	—	—	—	—	—	9·0
Edinburgh	16·5	96	4 7	+ 8	7 21	+14	8·6	10·8
Eskdalemuir	16·8	98	4 6	+ 4	7 21	+ 8	8·4	10·2
Stonyhurst	18·0	100	e 4 27	+10	—	—	—	10·8
Oxford	19·9	104	i 4 37	− 3	—	—	9·4	14·2
Kew	20·6	104	—	—	—	—	—	12·0
De Bilt	22·7	97	5 17	+ 4	9 25	+ 6	11·0	14·1
Uccle	23·2	100	e 5 14	− 5	9 25	− 4	11·0	13·3
Paris	23·7	106	e 5 20	− 5	e 9 36	− 2	12·0	14·0
Hamburg	24·1	89	i 5 35	+ 6	e 10 1	+15	e 14·2	17·8
Coimbra	26·2	133	5 31	−19	9 49	−37	11·7	12·1
Strasbourg	26·3	100	5 49	− 2	e 10 30	+ 2	e 14·6	15·4
Besançon	26·3	104	5 56	+ 5	10 24	− 4	14·0	—
Moncalieri	28·9	106	e 6 14	− 3	11 17	+ 2	14·2	—
Ottawa	29·1	256	6 19	0	11 16	− 3	e 14·4	—
Tortosa	29·1	119	6 5	−14	10 45	−34	14·0	18·9
Vienna	30·6	92	e 6 30	− 4	e 10 45	−59	e 15·2	20·8
Granada	30·6	129	7 27	+53	i 16 52	?L	(i 16·9)	—
Pola	31·9	99	e 14 57?	?L	—	—	(e 15·0?)	—
Toronto	32·1	258	5 51	−57	10 39	−91	i 18·4	18·8
Budapest	32·5	91	—	—	—	—	e 16·0	20·0
Rocca di Papa	33·7	104	—	—	(e 12 15)	−21	19·8	23·0
Chicago	37·5	264	7 39	+ 5	13 27	− 4	18·4	—
Helwan	52·1	96	16 57	?S	(16 57)	+12	(32·0)	—

Additional readings: De Bilt gives also MN = +15·0m. Epicentre 54°·5N. 32°·5W. Uccle MN = +12·9m. Hamburg MN = +16·4m., MZ = +15·8m. Readings all given as on 29d. Coimbra MN = +13·0m., T_o = 2h.8m.1s. Ottawa eLN = +15·4m., LE = +21·4m., T_o = 2h.10m.8s. Rocca di Papa gives S as eL.

June 30d. Readings also at 3h. (Simla), 8h. (Moncalieri, Strasbourg, Paris, Uccle, and De Bilt), 13h. (near Mizusawa), 14h. (near Athens), 16h. (Coimbra), 23h. (near Rocca di Papa).

TABLE.

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

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