The International Seismological Summary for 1922 July, August, September.

FORMERLY THE BULLETIN OF THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

The present number of the Summary deals with 89 epicentres, 31 of which are new and 58 repetitions from old epicentres. Corresponding figures are, since the beginning of the Summary in its International form :—

	New.				Old.			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
1918	36	44	43	35	44	38	67	53
1919	20	27	31	22	34	41	91	33
1920	24	27	31	27	47	48	49	42
1921	31	29	26	18	30	36	36	47
1922	32	38	31		36	51	58	

The cases of assumed abnormal focal depth are :—

Date.			Epicentre.		Depth below normal.
	d.	h.	°	°	
July	10	9	15·2S.	61·0W.	+·050
Aug.	3	9	18·5S.	168·5E.	+·020
Aug.	14	11	52·0N.	131·5E.	+·010
Sept.	4	17	9·0S.	66·0W.	+·080
Sept.	22	21	25·2N.	46·6W.	+·045

All these cases have been scrutinised with some care, and it seems clear that unless some of the evidence is defective to an extent which we have no warrant to assume, or some alternative hypothesis of a novel kind is invented, the focal depth must be considerable in all cases but that of August 14. On July 10, September 4, and September 22 the evidence of La Paz is practically vital, but the observations at that observatory have shown themselves worthy of confidence.

There were three shocks from apparently the same epicentre 36°·0N. 28°·0E. on Aug. 11d. 8h. 19·6m., 13d. 0h. 19·8m., 13d. 12h. 46·0m., for which direct comparisons are given as a test of the identity of focus.

For the North Formosa shocks of September 1 and September 14 an interesting note furnished by the Taihoku Observatory has been reproduced.

The work of collation still suffers from the delay in communicating results, although the effects of the war should now be almost negligible.

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

H. H. TURNER.

University Observatory, Oxford,
1926 March 24.

In correcting the proof the following approximate solutions were found for two cases previously relegated to the Notes :—

July 14d. 3h. 28m. 20s. Epicentre 2°·0S. 128°·5E. (as on 1921 May 20d.).

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

	Δ	Az.	P.	O−C.	L.	M.
	°	°	m. s.	s.	m.	m.
Manila	18·2	336	e 4 30	+11	—	—
Batavia	22·0	258	i 5 2	− 3	—	—
Zi-ka-wei	33·9	352	e 6 55	− 8	—	—
Adelaide	34·3	165	—	—	—	16·9
Riverview	38·2	148	—	—	e 19·4	—
De Bilt	111·4	326	—	—	e 59·7	—
Uccle	112·4	325	—	—	—	58·7

Additional readings : Batavia e = +2m.32s. Adelaide M = +22·0m.
De Bilt eLN = +61·7m.

July 14d. 21h. 10m. 22s. Epicentre 23°·3N. 122°·0E. (as on 1921 July 2d.).

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	e 0 51	+23	—	—	1·4	2·0
Hong Kong	7·3	264	1 43	−18	—	—	—	5·1
Zi-ka-wei	7·9	356	e 3 48	?S	(e 3 48)	+14	—	5·8
Manila	8·8	186	e 2 8	− 5	—	—	—	—
De Bilt	86·7	326	—	—	—	—	e 47·6	48·8
Uccle	87·8	325	—	—	—	—	e 46·6	—
Eskdalemuir	88·6	331	—	—	—	—	46·6	—

Additional reading : De Bilt eLN = +46·6m.

1922 JULY, AUGUST, & SEPTEMBER.

July 1d. 8h. 5m. 10s. Epicentre 37°·5N. 19°·7E. (as on 1922 June 29d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·2	81	e 0 51	+ 1	(e 1 27)	− 1	e 1·4	2·6
Rocca di Papa	6·8	311	e 3 58	?L	—	—	(e 4·0)	5·3
Belgrade	7·3	4	e 2 15	+24	e 4 10	?L	(e 4·2)	5·2
Zagreb	8·8	341	e 1 50	−23	—	—	e 4·8	6·2

Zagreb gives also MNW = +6·3m.

July 1d. Readings also at 0h. (Florence), 2h. (Manila and near Tokyo), 11h. (near Oaxaca), 12h. (near Vera Cruz and Tacubaya), 16h. (Coimbra), 17h. (Nagasaki and near Zurich), 19h. (Zagreb), 20h. (Manila), 23h. (Port au Prince).

July 2d. 8h. 26m. 30s. Epicentre 35°·0N. 142°·0E.

A = −·646, B = +·504, C = +·574; D = +·616, E = +·788; G = −·452, H = +·353, K = −·819.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	2·0	290	0 35	+ 4	e 1 0	+ 5	1·5	2·0
Mizusawa	4·2	351	1 8	+ 3	1 54	− 1	—	—
Nagoya	4·2	274	0 51	−14	—	—	—	—
Osaka	5·4	268	2 8	?S	(2 8)	−20	3·3	5·5
Kobe	5·7	268	2 29	?S	(2 29)	− 7	4·5	6·1
Zi-ka-wei	17·7	264	e 3 38	−35	e 7 44	+11	—	11·7
Zagreb	85·6	326	—	—	e 23 54	+28	—	—

Additional readings: Tokyo gives also MN = +2·5m. Mizusawa PN = +1m.6s. Osaka MN = +4·6m.

July 2d. 13h. 29m. 48s. Epicentre 23°·3N. 122°·0E. (as on 1921 April 2d.).

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	0 25	− 3	(0 44)	− 7	0·7	0·9
Hong Kong	7·3	264	1 34	−17	—	—	4·2	4·5
Zi-ka-wei	7·9	356	e 2 0	0	e 3 34	0	—	4·8
Manila	8·8	186	e 2 16	+ 3	—	—	4·6	4·9
Colombo	43·7	256	15 12	?S	(15 12)	+14	(27·7)	—

Additional readings: Zi-ka-wei gives also MZ = +5·4m. Manila MN = +4·6m. Colombo readings are given as P and S.

1922. July 2d. 13h. 35m. 48s. Epicentre **54°·0N 160°·5W.**

A = −·554, B = −·196, C = +·809; D = −·334, E = +·943; G = −·763, H = −·270, K = −·588.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	E.	14·5	68	e 3 33	0	9 25	?	e 11·6	11·9
Victoria		23·7	88	4 24	−61	(i 9 49)	+11	i 10·1	12·2
	Z.	23·7	88	5 18	− 7	(9 52)	+14	9·9	12·1
Berkeley		30·5	105	i 6 36	+ 3	11 42	− 1	i 14·8	—
Lick	E.	31·3	105	—	—	e 11 52	− 4	e 15·0	15·9
Honolulu		32·7	175	6 57	+ 3	12 7	−12	15·2	18·0
Tucson		41·1	100	e 7 5	−59	14 11	−11	23·2	—
Mizusawa		41·4	273	7 54	−12	14 6	−21	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo		44·6	271	e 9 11	+41	e 15 45	+35	e 22·2	—
Osaka		47·8	273	8 50	− 3	15 46	− 5	21·8	25·1
Kobe		48·0	273	8 4	−50	—	—	21·7	24·8
Chicago		48·1	74	i 8 51	− 4	15 43	−12	22·9	29·7
St. Louis		48·7	78	i 9 0	+ 2	i 16 0	− 2	e 20·1	28·2
Ann Arbor		49·9	70	9 12	+ 6	16 12	− 6	e 24·2	—
Toronto		51·4	66	10 36	+80	i 16 48	+12	i 28·7	31·7
Nagasaki		52·4	276	9 22	0	—	—	—	—
Ithaca		53·8	65	e 9 36	+ 4	16 53	−13	e 28·2	—
Northfield		54·6	61	e 14 27	?PR_1	—	—	e 29·2	—
Georgetown	E.	55·9	69	e 9 57	+12	16 35	−58	e 24·2	—
	N.	55·9	69	e 9 46	+ 1	16 33	−60	e 30·6	—
Washington		55·9	69	10 37	+52	18 30	+57	27·5	—
Zi-ka-wei		58·5	280	e 10 5	+ 3	e 18 10	+ 5	e 25·1	30·2
Tai-hoku		63·0	276	—	—	e 19 4	+ 3	27·2	—
Upsala		66·1	1	10 56	+ 4	19 38	0	e 29·6	44·5
Dyce	N.	67·4	12	10 52	− 8	20 12	+17	33·2	68·7
Apia		68·5	191	—	—	—	—	31·2	—
Edinburgh		68·5	13	e 11 38?	+30	20 16	+ 8	29·2	41·0
Eskdalemuir		69·1	13	i 11 13	+ 1	20 22	+ 7	33·2	40·1
Hong Kong		69·4	279	20 18	?S	(20 18)	− 1	—	41·4
Stonyhurst		70·6	13	11 42	+21	20 42	+ 9	36·2?	42·9
Bidston		71·0	13	12 22	+59	21 37	+59	—	44·2
Konigsberg		71·1	0	i 11 23	− 1	20 35	− 4	e 32·0	35·2
		71·1	0	—	—	20 37	− 2	—	40·2
Manila		71·5	270	e 11 48	+21	—	—	35·4	36·3
Hamburg		72·2	6	i 11 31	0	e 20 57	+ 5	e 32·2	51·2
Oxford		72·8	13	11 43	+ 8	21 8	+ 8	—	42·0
Kew		73·1	13	22 12	?S	(22 12)	+69	—	57·2
De Bilt		73·2	8	11 42	+ 5	21 6	+ 2	e 36·2	52·4
Uccle		74·4	9	11 45	0	21 0	−19	e 37·2	53·2
Lemberg		76·1	356	e 12 0	+ 4	e 20 54	−44	e 35·3	38·4
Paris		76·2	11	i 11 59	+ 3	i 21 42	+ 3	33·2	38·2
Strasbourg		76·9	7	i 11 59	− 1	i 21 49	+ 1	e 35·2	47·5
Vienna		77·7	2	e 12 2	− 3	i 21 58	+ 1	e 35·2	53·0
Zurich		78·2	8	e 12 6	− 2	e 22 4	+ 2	—	—
Besançon		78·2	9	e 11 55	−13	22 15?	+13	36·2	—
Innsbruck		78·5	7	i 12 10	0	e 21 42	−24	e 34·7	55·8
Zagreb		80·1	2	12 21	+ 1	i 22 21	− 3	e 33·2	58·7
Padova		80·4	7	12 15	− 6	22 37	+ 9	—	—
Moncalieri		80·5	10	11 30	−52	22 1	−28	35·2	54·7
Belgrade		81·2	359	i 12 23	− 3	i 21 48	−49	e 36·9	46·9
Simla	E.	81·4	315	12 24	− 3	22 0	−39	40·5	43·0
	N.	81·4	315	12 6	−21	21 48	−51	44·4	51·3
Tiflis		81·8	343	e 12 48	+19	e 23 0	+16	e 32·8	—
Florence		82·0	8	12 27	− 3	—	—	—	44·2
Marseilles		82·0	11	12 27	− 3	22 54	+ 8	38·2	49·2
Coimbra	E.	82·8	22	12 34	− 1	22 53	− 2	34·4	46·0
	N.	82·8	22	—	—	—	—	e 37·4	44·4
Calcutta		83·4	301	12 39	+ 1	27 33	?SR_1	42·0	48·6
Barcelona		83·4	13	12 37	− 1	e 22 57	− 4	e 40·7	48·7
Tortosa	N.	83·8	15	i 12 41	0	i 23 3	− 4	37·3	51·9
Rocca di Papa	E.	84·1	6	i 12 39	− 4	e 23 0	− 9	e 47·0	62·2
	N.	84·1	6	—	—	—	—	e 46·1	60·2
Pompeii		85·1	5	e 12 45	− 4	—	—	—	—
Rio Tinto		85·5	21	24 12	?S	(24 12)	+47	—	55·2
Granada		86·6	20	i 12 54	− 3	i 23 31	− 6	48·5	60·0
San Fernando		86·9	21	12 51	− 7	23 36	− 4	—	55·4
Algiers		88·1	13	12 58	− 8	23 41	−12	39·2	51·2
Bombay		94·0	311	16 46	?	28 44	?	—	56·8
Helwan		95·5	350	e 13 52	+ 6	—	—	51·2	59·2
Batavia		96·6	270	e 17 57	?	i 26 12	+50	e 48·0	—
Riverview		97·2	220	e 11 41	?	24 12	−76	e 42·8	—
Kodaikanal		99·4	302	23 24	?	—	—	60·4	63·9
Colombo		101·0	300	—	—	59 12	?L	63·5	64·2
Melbourne		103·1	222	—	—	—	—	e 55·2	68·0
La Paz		104·6	100	e 14 52	+20	27 2	+24	47·5	65·8

Additional readings and notes: Sitka gives also e = +7m.35s. Victoria iS is given as iL. Honolulu PN = +6m.46s., SR_1 = +14m.1s., T_0 = 13h.35m.47s. Tucson ePR_1E = +9m.38s., ePR_1N = +9m.12s., SR_1E = +17m.43s., SR_1N = +17m.32s., LN = +21·2m. Mizusawa PN = +7m.53s. Osaka MN = +24·4m. Kobe MN = +24·4m. Toronto iSR_1 = +20m.54s., i = +27m.36s. Ithaca ePR_1 = +11m.42s., eN = +20m.42s. Georgetown LE = +32·2m., LN = +35·2m. Zi-ka-wei

Notes continued on next page.

MZ = +30·6m. Upsala MN = +44·3m. Eskdalemuir PR_2 = +15m.44s., SR_1 = +25m.34s. Bidston readings have been diminished by 1h. Manila MN = +35·7m. Hamburg eSN = +20m.52s., SR_1 = +26m.12s., SR_2 = +29m.12s. De Bilt eSR_1 = +26m.0s., MN = +45·5m. Uccle SR_1 = +26m.5s., SR_2 = +30m.39s., MN = +39·6m. Paris MN = +45·2m. Strasbourg SR_1 = +26m.52s., SR_2 = +31m.12s., MN = +54·6m. Vienna e = +18m.12s., i = +22m.18s. Zagreb iSNW = +22m.24s., MNW = +56·3m. Padova PR_1 = +13m.10s., SR_1 = +22m.54s. Moncalieri MN = +54·2m. Belgrade PR_1 = +12m.32s., PR_2 = +13m.17s., SR_1 = +22m.24s., L = +44·7m. Simla SE and SN diminished by 10m. Tiflis e = +16m.0s., e = +28m.18s. Calcutta PE = +12m.7s. Rocca di Papa eLN = +41·7m. Granada MN = +59·0m. San Fernando MN = +64·9m. La Paz (S) = +24m.57s., L = +54·7m.

July 2d. 20h. 6m. 48s. Epicentre 37°·0N. 20°·5E. (as on 1921 Oct. 25d.).

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

The epicentre of July 1d. will not suit.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	2·8	69	0 40	− 4	(1 19)	+ 2	1·3	2·6
Rocca di Papa	7·6	311	e 3 36	?S	(e 3 36)	+10	—	—
Belgrade	7·8	0	e 1 59	+ 1	i 3 30	− 1	—	4·9
Zagreb	9·4	341	e 2 12	−10	—	—	e 4·7	6·1
Uccle	18·0	325	—	—	—	—	e 9·9	—

Additional readings: Athens gives also MN = +2·0m. Rocca di Papa iPE = +4m.0s., iPN = +4m.5s. Zagreb MNW = +7·9m.

July 2d. 21h. 23m. 48s. Epicentre 30°·0N. 90°·0W. (as on 1917 July 4d.).

A = ·000, B = −·866, C = +·500; D = −1·000, E = ·000; G = ·000, H = −·500, K = −·866.

Very doubtful. The above is the only previously adopted origin in the neighbourhood.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Chicago	11·9	9	—	—	—	—	e 6·6	—
Ann Arbor	13·3	20	3 18	+ 1	5 54	+ 3	6·7	—
Georgetown	13·9	47	e 3 36	+11	5 57	− 9	—	—
Washington	13·9	47	—	—	e 5 5	−61	—	—
Cheltenham	13·9	48	e 4 48	+83	—	—	—	5·8
Ithaca	16·5	37	e 3 52	− 7	—	—	—	—

Ithaca gives also P = +3m.22s.

July 2d. Readings also at 0h. (Florence), 3h. (near Hokoto), 8h. (Pompeii, Zi-ka-wei, and near Tokyo), 10h. (Taihoku), 12h. (Kobe), 14h. (La Paz), 15h. (Batavia and Cape Town), 16h. (Sydney and Adelaide), 21h. (near Tokyo).

July 3d. 5h. 29m. 16s. Epicentre 8°·5S. 67°·0E.

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Colombo		20·0	40	4 44	+ 3	8 44	+21	10·3	11·5
Kodaikanal		21·4	29	8 56	?S	(8 56)	+ 3	11·2	12·0
Bombay		28·0	12	10 47	?S	(10 47)	−12	—	—
Batavia		39·5	90	i 7 44	− 7	—	—	—	—
Simla	E.	40·8	13	14 8	?S	(14 8)	−10	e 18·4	—
	N.	40·8	13	13 38	?S	(13 38)	−40	e 18·5	—
Capetown		51·2	232	26 44	?L	—	—	(26·7)	—
Helwan		51·5	322	9 11	− 6	16 29	− 9	—	42·7
Tiflis		54·2	343	e 8 50	−44	—	—	e 21·7	—

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hong Kong		55·5	58	17 42	?S	(17 42)	+14	—	32·2
Manila		58·3	68	e 10 23	+22	—	—	—	—
Taihoku		62·8	57	—	—	—	—	e 31·7	—
Zi-ka-wei	Z.	65·4	50	10 58	+11	e 18 50	−40	—	38·4
Rocca di Papa		70·6	323	i 11 23	+ 2	—	—	—	—
Zagreb		70·9	327	i 11 23	+ 1	i 20 38	+ 1	42·7	—
Vienna	Z.	72·1	330	i 11 30	− 1	—	—	—	—
Moncalieri		75·4	323	10 35	−76	20 49	−41	30·8	—
Strasbourg	Z.	77·1	327	12 0	− 2	21 47	− 3	e 34·7	—
Hamburg		78·4	331	e 12 8	− 1	e 22 2	− 3	e 42·7	49·7
Tortosa	N.	78·4	318	12 12	+ 3	e 22 7	+ 2	e 46·7	—
Upsala		78·8	338	e 12 11	− 1	e 22 5	− 5	e 35·1	—
Uccle		80·0	327	e 12 17	− 2	e 22 19	− 4	—	—
Granada		80·0	312	i 12 25	+ 6	e 22 38	+15	—	—
De Bilt		80·2	329	—	—	22 26	+ 1	e 39·7	—
Kew		83·0	325	—	—	—	—	—	61·7
Coimbra		84·7	312	e 22 58	?S	(e 22 58)	−18	e 44·0	—
Stonyhurst		85·1	327	e 23 14	?S	(e 23 14)	− 6	—	56·2
Bidston		85·3	327	—	—	—	—	—	56·7
Eskdalemuir		86·1	329	—	—	e 23 19	−12	43·7	—

Additional readings and notes: Batavia gives also i = +8m.29s. Tiflis e = +10m.26s., +12m.26s., and +18m.50s. De Bilt eLN = +41·7m. Coimbra eLN = +45·0m.

July 3d. 8h. 21m. 45s. Epicentre 37°·5N. 19°·7E. (as on 1d.).

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·2	81	e 1 4	+14	—	—	e 1·7	2·4
Rocca di Papa	6·8	311	e 3 39	?L	—	—	(e 3·6)	—
Belgrade	7·3	4	e 1 35	−16	e 3 19	+ 1	—	3·6
Zagreb	8·8	341	e 2 15	+ 2	—	—	—	5·4
Hamburg	17·4	340	—	—	—	—	e 9·2	—

Additional readings: Athens gives also MN = +2·2m. Rocca di Papa iPN = +4m.27s., iPE = +4m.39s. Zagreb MNW = +8·4m.

July 3d. Readings also at 2h. (Port au Prince, Zi-ka-wei, and near Tokyo), 6h. (Cipolletti), 9h. (near Belgrade), 10h. (Simla), 12h. (Zi-ka-wei), 13h. (Batavia, Manila, Zi-ka-wei, and near La Paz), 15h. (Tiflis), 20h. (near Taihoku), 21h. (near La Paz).

July 4d. Readings at 5h. (Riverview and Wellington), 13h. (Toronto and Tacubaya), 19h. (Athens).

July 5d. 18h. 35m. 36s. Epicentre 54°·0N. 160°·5W. (as on July 2d.).

A = −·554, B = −·196, C = +·809; D = −·334, E = +·943; G = −·763, H = −·270, K = −·588.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Berkeley	Z.	30·5	105	—	—	—	—	e 15·0	—
Honolulu		32·7	175	—	—	—	—	e 15·2	17·8
Chicago		48·1	74	—	—	e 15 44	−11	28·2	—
Bidston		71·0	13	28 24	?	32 29	?L	(32·5)	44·4
De Bilt		73·2	8	—	—	e 21 6	+ 2	e 36·4	43·6
Uccle		74·4	9	e 11 46	+ 1	e 21 24	+ 5	e 38·4	—
Strasbourg		76·9	7	12 0	0	—	—	44·4	—
Vienna	Z.	77·7	2	i 12 5	0	—	—	—	—
Zagreb		80·1	2	e 12 21	+ 1	e 22 24	0	e 36·4	58·4
Tiflis		81·8	343	—	—	—	—	e 47·4	—
Coimbra	N.	82·8	22	66 30	?	—	—	—	—
Rocca di Papa	E.	84·1	6	e 12 42	− 1	23 12	+ 3	—	—
	N.	84·1	6	i 12 36	− 7	23 6	− 3	—	—

Additional readings: Honolulu gives also eN = +15m.24s. De Bilt MN = +45·4m.

July 5d. 20h. 20m. 0s. Epicentre 38°·5N. 144°·5E. (as on 1917 June 14d.).

$A = -\cdot637$, $B = +\cdot455$, $C = +\cdot623$; $D = +\cdot581$, $E = +\cdot814$; $G = -\cdot507$, $H = +\cdot361$, $K = -\cdot783$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa E.	2·7	283	0 33	− 9	—	—	—	—
Tokyo	4·7	235	i 1 20	+ 7	1 49	−20	2·3	2·4
Nagoya	6·9	243	1 42	− 3	(2 52)	−15	2·9	3·6
Osaka	8·2	245	2 8	+ 4	(3 30)	−12	3·5	4·6
Kobe	8·4	246	2 3	− 4	2 41	?	3·3	4·0
Zi-ka-wei	20·2	256	e 4 31	−12	e 7 58	−29	—	—
Hong Kong	30·5	244	11 0	?S	(11 0)	−43	—	—
Apia	66·4	133	35 33	?L	—	—	(35·6)	36·0
Upsala	72·4	335	e 11 34	+ 2	e 21 3	+ 8	e 38·1	45·8
Riverview	72·6	175	—	—	—	—	e 41·4	—
Konigsberg	75·1	330	i 11 50	0	—	—	e 38·7	47·0
Hamburg	79·9	335	i 12 18	0	—	—	e 41·0	49·0
Edinburgh	81·6	342	—	—	—	—	e 45·0	—
Vienna Z.	81·8	329	i 12 28	− 1	e 23 0	+16	—	48·0
Eskdalemuir	82·2	342	—	—	—	—	48·0	—
Belgrade	82·7	324	e 16 33	?PR_1	—	—	33·8	—
De Bilt	82·7	336	—	—	22 48	− 6	e 39·0	47·3
Stonyhurst	83·3	341	—	—	—	—	—	54·0
Bidston	83·9	341	13 44	+63	24 0	+52	—	55·0
Zagreb	83·9	327	12 39	− 2	—	—	e 43·0	53·4
Uccle	84·1	336	e 12 38	− 5	e 23 42	+33	e 39·0	52·0
Kew	84·9	340	—	—	—	—	—	55·0
Strasbourg	84·9	333	12 44	− 3	23 37	+19	45·0	—
Oxford	85·0	340	—	—	i 23 9	−10	43·0	53·5
Rocca di Papa	88·5	324	i 13 2	− 6	e 23 36	−22	55·6	—
Coimbra	97·4	340	—	—	—	—	e 49·0	—
La Paz	143·9	62	19 58	[+11]	—	—	—	—

Additional readings: Mizusawa gives also PN = +34s. Osaka MN = +4·3m. Kobe MN = +4·4m. Upsala MN = +45·0m. Hamburg MN = +44·0m. Belgrade e = +17m.6s. and +18m.52s., eL = +20·5m., L = +21·5m. De Bilt MN = +51·0m. Zagreb MNW = +46·0m. Rocca di Papa PR_1 = +16m.30s., eSN = +23m.24s., L = +58·2m.

July 5d. Readings also at 5h. (Merida and Colombo), 6h. (Batavia), 14h. (Manila and Batavia), 17h. (Vienna), 18h. (near Tokyo).

July 6d. Readings at 2h. (Apia), 3h. (near La Paz), 5h. (Mizusawa), 7h. (Apia), 13h. and 14h. (near Mizusawa), 18h. (near La Paz), 23h. (Riverview).

July 7d. Readings at 1h. (near Colima), 7h. (Colombo), 14h. (La Paz), 16h. (Rio Tinto and near Zurich), 17h. (Nagoya (2), near Mizusawa (2), and near Tokyo (3)), 19h. (near Tokyo and near Mizusawa), 20h. (Pompeii and Rocca di Papa), 21h. (Rocca di Papa (2)).

July 8d. Readings at 2h. (near Osaka, Mizusawa (2), and Tokyo (2)), 3h. (Rocca di Papa), 4h. (Malaga and near Granada), 9h. (near Mizusawa), 12h. (La Paz), 14h. and 15h. (near Mizusawa), 18h. (near Tacubaya), 21h. (Manila).

July 9d. Readings at 3h. (near Batavia), 9h. (Taihoku, Zi-ka-wei, Manila, and Hong Kong), 12h. (Zagreb), 14h. (near Tacubaya), 16h. (near Zurich and near Rocca di Papa), 17h. (Stonyhurst).

July 10d. 9h. 37m. 57s. Epicentre 15°·2S. 61°·0W. (as on 1919 Sept. 16d.).

$A = +\cdot468$, $B = -\cdot844$, $C = -\cdot262$; $D = -\cdot875$, $E = -\cdot485$; $G = -\cdot127$, $H = +\cdot229$, $K = -\cdot965$.

A depth of focus 0·050 is assumed on the evidence of La Paz. Without that the other observations could be satisfied by moving the epicentre some 8° or 9° north.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz		−0·3	7·0	258	i 1 51	+ 9	—	—	3·1	3·2
Andalgala	N.	−1·1	13·3	201	2 57	− 5	—	—	4·4	4·6
Pilar		−1·4	16·7	188	—	—	—	—	4·7	11·2
Mendoza		−2·4	18·9	200	2 15	−104	—	—	2·4	3·0
Cipolletti		−2·6	24·6	193	—	—	(9 3)	− 2	9·0	10·0
Tacubaya	E.	−4·9	51·1	313	8 26	−15	15 56	+25	—	—
	N.	−4·9	51·1	313	8 24	−17	15 1	−30	—	—
Washington		−5·3	56·1	347	—	—	e 17 3	+34	—	—
Ithaca		−5·5	59·4	350	e 9 37	+ 5	e 17 17	+ 9	—	—
Northfield		−5·5	60·3	351	—	—	e 18 3	−76	—	—
Chicago		−5·6	62·0	340	9 48	0	17 35	− 4	—	—
Ottawa		−5·6	62·1	350	9 56	+ 7	17 53	+13	25·6	—
Coimbra		−6·0	73·9	40	11 15	+12	20 21	+20	29·0	—
Granada		−6·0	75·1	45	i 11 14	+ 2	i 20 32	+17	e 33·0	38·6
Algiers		−6·2	79·6	48	11 41	+ 3	21 3	− 4	—	—
Tortosa		−6·2	79·8	43	11 41	+ 1	21 13	+ 4	e 33·0	34·5
Bidston		−6·4	84·5	31	13 58?	+110	18 3	?PR_1	—	28·0
Kew		−6·4	84·9	33	—	—	—	—	—	22·0
Paris		−6·4	85·1	37	(e 12 3)	− 8	—	—	e 12·0	—
Eskdalemuir		−6·4	85·5	30	e 12 13	− 1	i 21 45	−28	—	—
Zurich		−6·5	88·0	40	12 21	− 7	21 59	−42	—	—
Strasbourg		−6·5	88·0	40	12 22	− 6	22 0	−41	e 35·0	—
De Bilt		−6·5	88·3	35	—	—	i 22 2	−42	e 36·0	—
Rocca di Papa		−6·5	88·4	47	i 12 21	− 9	—	—	—	12·6
Padova		−6·5	89·3	42	—	—	22 11	−44	—	—
Hamburg		−6·5	91·4	35	e 17 3	?PR_1	i 22 19	−59	47·0	—
Zagreb		−6·5	92·1	43	e 12 51	0	i 22 22	−64	52·0	—
Manila		—	178·0	252	e 24 40	?PR_1	—	—	—	—

Additional readings and notes: Andalgala readings have been increased by 12 min. Ithaca gives also e = +12m.4s. Chicago $SR_1 = +21$m.6s. Ottawa i = +18m.48s., eE = +21m.23s., T_0 = 9h.38m.0s. Eskdalemuir eZ = +14m.21s. and +15m.55s.

July 10d. Readings also at 3h. (Tiflis and Rocca di Papa), 8h. (Taihoku), 9h. Malaga and near Granada), 13h. (Malaga and near Granada).

July 11d. 14h. 13m. 0s. Epicentre 22°·3N. 143°·2E. (as on 1920 Jan. 12d.).

$A = -\cdot741$, $B = +\cdot554$, $C = +\cdot380$; $D = +\cdot599$, $E = +\cdot801$; $G = -\cdot304$, $H = +\cdot227$, $K = -\cdot925$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	13·7	348	e 4 3	+41	—	—	e 6·8	7·0
Nagoya	14·0	338	2 52	−34	—	—	—	—
Osaka	14·1	333	3 27	0	—	—	—	6·8
Kobe	14·2	332	3 31	+ 2	—	—	—	6·4
Nagasaki	15·8	314	3 50	+ 1	—	—	—	6·6
Mizusawa	16·9	355	4 4	0	(7 8)	− 8	—	—
Manila	22·5	254	e 5 0	−11	—	—	9·8	—
Batavia	45·6	236	i 7 47	−50	—	—	—	—
Konigsberg	88·6	331	—	—	23 1	− 58	47·4	—
Hamburg	94·0	334	—	—	e 23 0	−116	45·0	—
Zagreb	96·8	326	—	—	i 23 44	−100	49·0	—
De Bilt	97·0	336	—	—	e 23 47	− 99	e 48·0	54·7
Eskdalemuir	97·3	342	—	—	e 23 48	−101	e 39·0	—
Uccle	98·4	335	—	—	e 23 54	−106	e 49·0	—
Strasbourg	98·7	330	—	—	—	—	e 51·0	—
Kew	99·5	340	—	—	—	—	—	24·0
La Paz	149·9	85	19 46	[−10]	—	—	—	—

Additional readings: Kobe gives also MN = +4·5m. Mizusawa S is given as the P of a subsequent shock close to Mizusawa, for which S − P = 11s. Zi-ka-wei (Δ = 21°·3), gives simply 14h. De Bilt MN = +55·6m. Eskdalemuir e = +26m.2s., eS? = +31m.17s.

July 11d. Readings also at 21h. (Algiers).

July 12d. 5h. 11m. 46s. Epicentre 35°·0N. 24°·0E. (as on 1920 Sept. 6d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	2·9	356	0 51	+ 6	(i 1 17)	− 3	i 1·3	1·4
Pompeii	9·4	310	e 3 4	+42	—	—	—	—
Belgrade	10·2	346	e 2 30	− 3	e 4 37	+ 2	—	5·3
Rocca di Papa	11·1	311	e 2 50	+ 4	(e 4 38)	−19	—	5·5
Zagreb	12·5	332	e 2 44	−22	—	—	—	6·0
Strasbourg	18·1	324	—	—	e 8 14	+32	—	—
Uccle	21·2	324	—	—	—	—	e 10·2	—
De Bilt	21·7	328	—	—	—	—	e 10·5	11·4
Eskdalemuir	27·6	326	—	—	—	—	13·2	—

Additional readings and notes: Athens PN = +52s., iPE = +53s., MN = +1·9m. Belgrade eP = +3m.59s. Rocca di Papa eNE = +2m.56s., eE = +3m.38s. S is given as PR_1. Zagreb MNW = +7·1m.

July 12d. Readings also at 4h. (Kobe, Nagasaki, and Osaka), 5h. (near Tacubaya), 6h. (Hamburg and Rocca di Papa), 9h. (near Tokyo), 11h. (Rocca di Papa and Pompeii), 19h. (Manila).

July 13d. 1h. 22m. 46s. Epicentre 43°·2S. 148°·5E.

A = −·622, B = +·381, C = −·685; D = +·522, E = +·853; G = +·584, H = −·358, K = −·729.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Melbourne	6·0	332	1 32	0	2 44	0	3·5	4·3
Riverview	9·5	13	—	—	—	—	e 3·9	—
Sydney	9·5	13	2 20	− 3	(4 2)	−14	4·0	4·9
Adelaide	11·3	314	e 3 14	+25	e 5 14	+12	—	8·2
Christchurch	17·5	99	7 38	?S	(7 38)	+ 9	11·3	12·2
De Bilt E.	154·1	303	—	—	—	—	e 88·2	—
Uccle	154·7	300	—	—	—	—	—	84·2
Eskdalemuir	158·2	313	—	—	—	—	82·2	—
Stonyhurst	158·2	310	—	—	—	—	—	96·2

Additional readings and notes: Christchurch readings have been increased by 10m. De Bilt gives also eLN = +86·2m.

July 13d. 4h. 58m. 0s. Epicentre 6°·3N. 123°·2E. (as on 1922 June 24d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	8·6	346	e 2 6	− 4	5 56	?L	7·6	8·2
Taihoku	18·8	355	4 30	+ 3	7 51	− 7	10·4	—
Batavia	20·6	233	5 9	+21	i 9 7	+31	e 23·4	—
Zi-ka-wei	25·0	356	e 5 15	−23	e 9 30	−33	—	14·7
Kobe	30·5	21	6 25	− 8	—	—	14·5	17·5
Osaka	30·6	21	6 45	+11	—	—	—	19·6
Tokyo	33·1	25	i 7 5	+ 8	(e 13 1)	+35	e 13·0	17·4
Colombo	43·0	273	10 0	?	14 48	0	19·0	31·0
Adelaide	43·8	161	—	—	i 14 48	−11	e 22·0?	26·4?
Kodaikanal	45·5	278	14 24	?S	(14 24)	−57	27·2	31·4
Riverview	48·1	148	e 11 27	?PR_1	e 15 48	− 7	e 26·7	—
Simla N.	49·7	309	—	—	e 16 0	−15	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis		77·2	313	e 12 18	+16	e 22 6	+15	e 37·0	45·2
Honolulu		77·3	70	—	—	e 21 0	−52	—	—
Helwan		88·4	300	e 13 5	− 2	24 0	+ 4	—	62·0
Konigsberg		92·1	327	23 57	?S	(23 57)	−39	51·3	—
Vienna		96·3	321	e 17 36	?PR_1	—	—	—	54·0
Zagreb		97·2	318	e 17 54	?PR_1	—	—	e 48·0	55·0
Hamburg		98·2	326	—	—	e 25 0	−38	e 50·0	54·0
Rocca di Papa		100·8	314	e 15 18	+64	e 25 42	−21	e 48·5	—
Strasbourg		101·5	321	e 19 0	?PR_1	—	—	e 56·0	—
De Bilt	E.	101·6	325	—	—	e 24 6	−125	e 49·0	57·2
	N.	101·6	325	—	—	e 25 49	−22	—	53·6
Dyce	N.	102·6	334	—	—	e 25 26	−54	50·9	57·3
Uccle		102·6	325	—	—	e 25 18	−62	e 48·0	57·2
Besançon		103·2	321	—	—	—	—	56·0	—
Edinburgh		103·8	332	—	—	—	—	54·0	—
Eskdalemuir		104·2	331	—	—	e 25 30	−65	49·0	58·4
Paris		104·5	323	—	—	e 32 4	?SR_1	e 52·0	60·0
Stonyhurst		104·6	330	e 31 30	?SR_1	42 30	?	57·5	66·0
Kew		104·8	328	—	—	—	—	—	68·0
Bidston		105·2	330	—	—	35 35?	?SR_1	—	52·7
Oxford		105·2	328	—	—	i 25 38	−66	52·1	64·9
Tortosa	N.	109·5	317	—	—	—	—	e 53·0	60·1
Granada		114·1	315	—	—	—	—	e 57·0	68·5
Coimbra		115·9	320	e 13 35	−110	26 30	−107	e 52·5	—
Chicago		124·3	27	—	—	e 27 0	−141	77·3	—
Ottawa		125·6	15	e 20 55	?PR_1	—	—	60·0	—
La Paz		165·0	134	16 27	?	—	—	(60·6)	—

Additional readings and notes: Manila gives also MN = +8·5m. Zi-ka-wei PSN = +9m.49s., PSE = +9m.54s., MN = +14·8m. Kobe MN = +16·6m. Osaka MN = +20·0m. Adelaide iSR_1 = +18m.48s. Riverview eS = +19m.28s. Simla eN = +14m.6s. Rocca di Papa ePE = +16m.57s., iPN = +17m.29s., eS = +32m.15s. Dyce iN = +28m.16s. Eskdalemuir e? = +33m.45s., e = +38m.30s., MN = +57·9m. Paris MN = +58·0m. La Paz readings are given as P of separate shocks.

July 13d. Readings also at 3h. (Pompeii and near Rocca di Papa), 9h. (La Paz), 10h. (Colombo, Manila, Zi-ka-wei, Batavia, and Simla), 11h. (De Bilt and La Paz), 13h. (Manila), 17h. (De Bilt), 20h. (La Paz), 21h. (Taihoku, De Bilt, Manila, Zi-ka-wei, Hong Kong, Eskdalemuir, and Uccle).

July 14d. 9h. 19m. 24s. Epicentre 38°·0N. 128°·0E.

A = −·485, B = +·621, C = +·616; D = +·788, E = +·616; G = −·379, H = +·485, K = −·788.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kobe		6·6	118	1 41	0	—	—	3·6	5·7
Osaka		6·9	117	2 3	+18	—	—	3·6	4·5
Nagoya		7·7	110	1 53	− 4	—	—	3·5	3·6
Tokyo		9·7	101	i 2 24	− 2	—	—	i 2·9	3·3
Mizusawa	E.	10·3	80	2 34	0	4 34	− 3	—	—
	N.	10·3	80	2 31	− 3	4 35	− 2	—	—
Manila		24·2	197	e 7 6	?	—	—	—	—

Additional readings: Kobe gives also MN = +4·6m. Osaka MN = +4·0m. Tokyo MN = +3·2m.

2a P106. July 14d. Readings also at 2h. (Batavia), 3h. (Batavia, Manila, Zi-ka-wei, Adelaide, Riverview, and near Christchurch), 4h. (De Bilt and Uccle), 5h. (De Bilt and Uccle), 11h. (near Tokyo and Mizusawa), 15h. (Nagasaki), 18h. (near Rocca di Papa).

July 15d. Readings at 3h. (Osaka, Kobe, and Taihoku), 6h. (La Paz), 15h. (La Paz and near Tacubaya), 17h. (Taihoku), 20h. (Riverview and near Christchurch).

July 16d. Readings at 2h. (Bidston), 8h. (La Paz), 11h. (Paris), 19h. (Oaxaca), 20h. (near Mizusawa), 23h. (Manila).

July 17d. Readings at 0h. (near Granada), 4h. (Christchurch, Melbourne, Tortosa, and Manila), 5h. (near La Paz), 13h. (near Tokyo), 19h. (La Paz), 21h. (Zi-ka-wei and near Manila).

July 18d. Readings at 3h. (Colombo and Moncalieri), 4h. (Merida), 7h. (near Algiers), 8h. (Bidston), 9h. (Christchurch, Riverview, Adelaide, and Colombo), 18h. (Batavia), 22h. (Batavia and Manila).

July 19d. 12h. 54m. 50s. Epicentre 25°·5N. 120°·0E.

A = −·451, B = +·782, C = +·431; D = +·866, E = +·500; G = −·215, H = +·373, K = −·903.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	E.	1·5	109	0 18	− 5	—	—	0·5	0·5
Hokoto		2·0	206	0 34	+ 3	—	—	1·1	1·4
Zi-ka-wei		5·8	12	e 1 38	+ 8	e 3 7	?L	(e 3·1)	4·0
Hong Kong		6·2	240	1 40	+ 5	—	—	—	4·7
Manila		11·0	175	e 2 27	−17	—	—	4·6	—
Nagasaki		11·2	47	2 58	+11	—	—	—	—
Tokyo		19·8	54	e 3 22	−77	—	—	—	—
Batavia		34·2	204	e 7 4	− 3	i 12 52	+ 9	—	—
Colombo		42·6	251	18 10	?SR_1	—	—	—	—
Hamburg		80·6	326	—	—	e 21 10	−80	45·2	53·2
Zagreb		81·0	317	—	—	e 23 10	+35	45·2	—
De Bilt		83·9	326	—	—	—	—	e 43·2	49·1
Dyce	N.	84·1	333	—	—	—	—	45·2	—
Strasbourg		84·5	322	—	—	—	—	e 46·2	—
Uccle		85·0	326	—	—	—	—	e 43·2	48·2
Edinburgh		85·4	332	—	—	—	—	e 44·2	56·2
Eskdalemuir		85·8	332	—	—	e 23 30	+ 2	42·2	47·2
Moncalieri		86·4	320	—	—	e 23 33	− 1	47·7	—
Stonyhurst		86·5	330	e 45 40	?L	—	—	(e 45·7)	51·7
Kew		86·9	328	—	—	—	—	—	56·2
Bidston		87·0	330	—	—	—	—	—	59·0
Paris		87·2	324	—	—	e 47 10	?	e 55·2	57·2
Oxford		87·3	328	—	—	i 23 20	−24	43·7	48·7
Coimbra		98·6	323	e 21 28	?	e 30 28	?	e 53·2	—
La Paz		168·2	42	20 16	[+ 2]	—	—	—	—

Additional readings: Zi-ka-wei MN = +4·3m., MZ = +5·0m. Hamburg e = +37m.10s. Moncalieri S? = +30m.37s.

July 19d. Readings also at 9h. (Colombo), 12h., 13h. (2), and 15h. (Taihoku), 16h. (Zi-ka-wei and near Manila), 17h. (Taihoku and Nagasaki), 20h. (Taihoku (2)), 21h. (Taihoku and La Paz).

July 20d. Readings at 1h. (near Taihoku), 8h. (Sydney, Riverview, La Paz, Taihoku (2), Zi-ka-wei, Manila, and Batavia), 10h., 11h., 12h., and 16h. (Taihoku), 17h. (La Paz), 18h. (Algiers and Rocca di Papa), 20h. (Taihoku (2) and La Paz).

July 21d. Readings at 0h. (Taihoku, Wellington, and Manila), 1h. (Taihoku), 3h. (La Paz and near Rocca di Papa), 6h. (Manila), 8h. (Taihoku (2)), 12h. (Taihoku), 17h. (near Tacubaya), 18h. (Dyce), 20h. (Zi-ka-wei), 21h. (near Tacubaya), 22h. (Zi-ka-wei and near Tacubaya), 23h. (Taihoku (2) and near Mizusawa).

July 22d. 13h. 17m. 0s. Epicentre 55°·0N. 38°·0E. (as on 1921 Oct. 2d.).

A = +·452, B = +·353, C = +·819; D = +·616, E = −·788; G = +·646, H = +·504, K = −·574.

	Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Belgrade	15·1	235	e 4 10	+30	(6 0)	−34	6·0	—
Hamburg	16·3	277	—	—	—	—	e 7·0	14·0
Zagreb	16·6	246	e 4 54	+54	e 7 6	− 3	—	8·7
Strasbourg	19·6	264	e 3 55	−41	—	—	e 11·0	—
De Bilt	19·6	275	—	—	—	—	e 12·0	—
Uccle	20·5	271	—	—	e 8 24	−10	e 11·7	—
Moncalieri	21·7	255	—	—	e 8 21	−38	10·9	—
Eskdalemuir	23·2	288	—	—	—	—	10·0	—
Algiers	29·9	247	11 34	?S	(11 34)	+ 2	—	—

Additional readings: Belgrade gives also e = +5m.25s., L = +7·0m. De Bilt e = +9m.0s. Zante (Δ = 21°·7, Az. = 225°) gives simply 13h.13m.

July 22d. 16h. 26m. 46s. Epicentre 35°·0N. 22°·5E. (as on 1922 June 5d.).

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

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Athens		3·1	18	1 0	+11	i 1 51	+25	2·1	2·5
Pompeii		8·5	315	e 3 32	?S	(e 3 32)	−18	—	—
Helwan		9·1	122	2 15	− 3	3 45	−21	—	9·7
Belgrade		9·9	352	e 2 11	−18	—	—	i 5·7	6·9
Rocca di Papa		10·2	314	i 2 34	+ 1	e 4 32	− 3	—	11·2
Zagreb		11·9	337	e 2 56	− 2	i 5 15	− 2	e 6·3	9·0
Padova		13·1	325	3 26	+12	8 50	?L	(8·8)	12·2
Vienna	Z.	14·0	343	e 3 33	+ 7	i 6 29	+21	—	9·7
Lemberg		14·8	4	e 1 44	?	—	—	e 7·5	8·9
Moncalieri		15·0	316	e 3 47	+ 8	6 43	+11	9·3	14·4
Algiers		15·8	282	3 51	+ 2	7 0	+10	9·2	13·7
Zurich		16·1	324	e 3 56	+ 3	e 7 5	+ 8	—	—
Barcelona		17·2	298	e 4 9	+ 2	e 7 40	+18	e 9·3	—
Besançon		17·3	320	e 4 37	+28	7 52?	+27	13·2	—
Strasbourg		17·4	326	4 10	0	7 25	− 2	e 10·2	13·0
Tortosa		18·2	295	4 23	+ 4	7 48	+ 4	8·7	—
Tiflis		18·7	62	e 5 32	+67	e 9 8	+73	—	12·5
Konigsberg	E.	19·9	357	i 4 38	− 2	8 13	− 8	—	12·7
	N.	19·9	357	—	—	8 19	− 2	—	15·2
Paris		20·2	320	4 44	+ 1	8 29	+ 2	12·2	15·2
Hamburg		20·5	339	e 4 41	− 6	e 8 43	+ 9	e 12·2	14·4
Uccle		20·5	326	e 4 46	− 1	e 8 27	− 7	e 11·2	—
De Bilt		21·1	329	4 57	+ 3	8 53	+ 7	11·7	15·1
Granada		21·1	284	i 4 51	− 3	i 9 4	+18	i 13·7	18·4
Kew		23·2	322	—	—	—	—	—	19·2
Rio Tinto		23·5	285	10 14	?L	—	—	(10·2)	23·2
Oxford		23·8	322	5 22	− 4	9 41	+ 1	—	16·0
Coimbra		24·9	291	e 5 23	−14	i 10 5	+ 4	e 13·9	—
Upsala		25·0	354	5 32	− 6	10 0	− 3	e 14·8	17·8
Bidston		25·7	324	6 1	+16	11 24	+68	—	17·3
Eskdalemuir		26·9	328	e 5 53	− 4	10 27	−12	14·2	15·9
Edinburgh		27·2	328	—	—	e 10 14	−31	—	19·4
Dyce	N.	27·7	331	—	—	e 10 43	−11	15·6	17·6
Cape Town		69·0	184	38 14	?L	—	—	(38·2)	—

Additional readings and notes: Athens gives also MN = +2·6m., T_e = 16h.26m.43s. Belgrade PR_1 = +4m.18s., iSR_1 = +5m.17s Vienna $PR_1Z?$ = +4m.26s., S? = +8m.22s., $SR_1?$ = +8m.57s. Lemberg readings have been diminished by 1h. Moncalieri MN = +11·4m. Strasbourg ePEN = +4m.14s., MN = +11·1m. Tiflis MN = +12·2m. Konigsberg P is for Z component; the other readings are as entered. De Bilt MN = +12·6m. Coimbra SN = +10m.19s., T_e = 16h.26m.15s. Upsala MN = +18·8m. Bidston alternative P = +8m.6s. Dyce iN = +11m.23s.

July 22d. Readings also at 3h. (Zi-ka-wei), 4h. (Manila, Colombo (2), Zi-ka-wei, and De Bilt), 8h. (La Paz), 12h. (Apia), 19h. (La Paz), 20h. (near Rocca di Papa and Pompeii).

July 23d. Readings at 4h. (near Granada), 7h. (near Rocca di Papa (2) and near Batavia), 8h. (Zi-ka-wei), 12h. and 15h. (Taihoku), 17h. (La Paz), 19h. (Tiflis), 20h. (Apia).

July 24d. Readings at 0h. (Coimbra and De Bilt), 1h. (Eskdalemuir), 6h. (Taihoku (2)), 12h. (La Paz), 13h. (Hong Kong and Taihoku), 16h. (Taihoku), 18h. (Algiers), 19h. (near Mizusawa).

July 25d. Readings at 3h. (Puebla and Colombo), 4h. and 7h. (Taihoku), 9h. (Batavia), 10h. (Bidston, Ottawa, and near Merida and Tacubaya), 13h. (Manila), 15h. (Taihoku), 16h. (near Zurich).

July 26d. 6h. 31m. 0s. Epicentre 50°·0N. 50°·0W.

$A = +\cdot413$, $B = -\cdot492$, $C = +\cdot766$; $D = -\cdot766$, $E = -\cdot643$; $G = +\cdot492$, $H = -\cdot587$, $K = -\cdot643$.

Very rough.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ottawa	17·8	265	e 4 14	− 1	e 7 37	+ 1	e 9·1	—
Washington	22·1	250	—	—	—	—	e 13·0	—
Chicago	27·1	267	—	—	e 11 15	+32	—	—
Eskdalemuir	28·3	61	—	—	—	—	13·0	—
Bidston	28·7	65	—	—	—	—	16·0	—
De Bilt	33·9	65	—	—	—	—	e 17·0	19·3

No additional readings.

July 26d. Readings also at 0h. (Malaga (2) and Granada (2)), 4h. (Melbourne and Wellington), 8h. (Taihoku and Adelaide), 10h. (Zi-ka-wei and Batavia (2)), 11h. (Zi-ka-wei), 16h. (La Paz), 20h. (Zante), 22h. (near Manila and near Tokyo).

July 27d. 3h. 0m. 54s. Epicentre 35°·5N. 2°·5W.

$A = +\cdot813$, $B = -\cdot036$, $C = +\cdot581$; $D = -\cdot044$, $E = -\cdot999$; $G = +\cdot580$, $H = -\cdot025$, $K = -\cdot814$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Almeria	1·4	1	—	—	0 40	+ 1	—	—
Granada	1·9	332	1 0 25	− 4	—	—	—	—
Malaga	2·0	308	—	—	—	—	1·0	—
Alicante	3·2	30	1 10	+20	—	—	—	—
Tortosa	5·8	24	1 30	0	2 39	0	2·8	3·8
Coimbra	6·6	318	e 2 39	?S	3 21	?L	(3·4)	3·6

Coimbra gives also MN = +3·7m., T_o = 3h.2m.18s.

July 27d. Readings also at 2h. (Tiflis and Vienna), 5h. (Merida, Vera Cruz, Taihoku, and Oaxaca), 9h. (Lick), 10h. (Vera Cruz), 13h. (Apia), 15h. and 16h. (La Paz), 22h. (Taihoku), 23h. (Simla and Tacubaya).

July 28d. 8h. 0m. 0s. Epicentre 28°·5S. 71°·5W.

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Andalgala	N.	4·7	80	1 48	+35	—	—	2·2	2·5
Mendoza		5·2	150	0 18	−62	—	—	0·9	2·4
Pilar		7·3	117	1 54	+ 3	(2 42)	−36	2·7	4·0
Cipolletti		10·8	166	4 48	?S	(4 48)	− 2	5·2	6·0
La Paz		12·4	15	3 6	+ 1	5 31	+ 2	6·4	8·1
Chacareta	E.	12·7	122	2 54	−15	—	—	4·0	4·2
	N.	12·7	122	2 54	−15	—	—	4·6	4·7
Coimbra		90·2	43	e 23 0	?	33 35	?	46·0	—
Eskdalemuir		102·0	33	—	—	—	—	50·0	—
Uccle		103·6	39	—	—	—	—	e 53·0	—
Strasbourg		104·4	43	—	—	—	—	e 50·0	—
De Bilt		104·6	38	—	—	e 29 48	+190	e 55·0	64·0

Additional readings: Andalgala gives also LE = +1·6m., ME = +2·9m., readings all increased by 3m. Pilar MN = +3·6m. Cipolletti readings diminished by 4m. La Paz MN = +7·8m. De Bilt eLN = +57·0m.

July 28d. 23h. 43m. 0s. Epicentre 32°·5N. 42°·0W. (as on 1920 Sept. 17d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Coimbra		27·9	64	—	—	10 51	− 6	12·4	13·0
Tortosa	N.	34·4	63	—	—	—	— e 14·0		16·6
Bidston		34·7	42	7 2	− 9	14 45	+114	(15·8)	18·0
Eskdalemuir		35·3	39	—	—	e 13 4	+ 4	14·8	—
Edinburgh		35·6	39	—	—	—	—	e 17·0	—
Dyce	N.	36·7	35	—	—	—	—	15·0	—
Uccle		38·3	48	—	—	e 13 44	+ 2	e 16·5	—
De Bilt		39·1	46	—	—	e 13 58	+ 5	e 16·9	18·2
Strasbourg		40·2	51	—	—	e 14 21	+11	e 18·0	—
Hamburg		42·2	43	—	—	—	—	e 19·0	20·0
Rocca di Papa		43·8	61	—	—	—	—	e 20·0	25·0

Additional readings: Coimbra gives also eE = +6m.50s., eN = +7m.50s., LN = +11·5m. Bidston alternative P = +7m.50s., the reading for L is recorded as an alternative S. Dyce iN = +21m.0s. (?iL).

July 28d. Readings also at 7h. (Batavia, Manila, and Zi-ka-wei), 8h. (La Paz), 9h. (near Tokyo), 11h. (Tokyo, Zi-ka-wei, and near Mizusawa), 12h. Uccle), 15h. (Zi-ka-wei), 16h. (La Paz), 18h. (Manila and Zi-ka-wei), 19h. (Colombo and De Bilt), 21h. (Taihoku), 22h. (Zagreb, Rocca di Papa, and Pompeii).

July 29d. Readings at 3h. (near Tokyo), 9h. (La Paz, Mendoza, Pilar, and Cipolletti), 10h. (Strasbourg), 13h. (Zi-ka-wei, Manila, and Batavia), 19h. (Nagasaki (2)), 20h. (Dehra Dun, Simla, Upsala, De Bilt, Honolulu, Zagreb, Hamburg, Rocca di Papa, Apia, and Vienna).

July 30d. Readings at 6h. (La Paz), 9h. and 11h. (Taihoku). 16h. (Nagasaki (2) and Zi-ka-wei), 23h. (La Paz).

July 31d. Readings at 2h. (near Merida and near Tortosa), 8h. (Batavia), 22h. (Taihoku).

Aug. 1d. Readings at 0h. (Rocca di Papa and La Paz), 1h. (De Bilt and Strasbourg), 3h. (Taihoku), 6h. (Adelaide), 8h. (Zi-ka-wei), 12h. (Zi-ka-wei and near Mizusawa), 13h. and 14h. (Taihoku), 15h. (Taihoku and Moncalieri), 19h. (Taihoku), 21h. (Rocca di Papa), 22h. (near Tacubaya).

Aug. 2d. 6h. 10m. 45s. Epicentre 35°·5N. 2°·5W. (as on 1922 July 27d.).

A = +·813, B = −·036, C = +·581.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Granada	1·9	332	0 29	0	i 0 57	+ 4	i 1·1	1·4
Malaga	2·0	308	0 24	− 7	—	—	—	—
San Fernando	3·1	288	0 27	−22	—	—	—	0·7
De Bilt E.	17·4	16	—	—	—	—	e 10·0	—

Granada gives also MN = +1·2m.

Aug. 2d. 21h. 13m. 0s. Epicentre 43°·8N. 11°·2E. (Florence).
(as on 1922 April 7d.).

A = +·708, B = +·140, C = +·692; D = +·194, E = −·981;
G = +·679, H = +·134, K = −·722.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	0·0	—	0 0	0	—	—	—	0·2
Padova	1·7	17	0 21	− 5	0 38	−10	0·7	—
Rocca di Papa	2·3	152	—	—	—	—	1·5	2·7
Moncalieri	2·8	295	e 0 50	+ 6	1 20	+ 3	—	—
Zagreb	4·0	58	e 1 14	+12	—	—	e 2·1	2·7
Zurich	4·0	332	e 0 48	−14	1 48	− 2	—	—

Zagreb gives also MNW = +2·3m.

Aug. 2d. Readings also at 1h. (Hong Kong, Lick, Zi-ka-wei, and Manila), 2h. (De Bilt, Uccle, and Bidston), 6h. (near Balboa Heights), 7h. (Dyce), 8h. (Kingston), 10h. (Algiers), 15h. (near Vera Cruz and Tacubaya).

Aug. 3d. 9h. 41m. 20s. Epicentre 18°·5S. 168°·5E.

A = −·929, B = +·189, C = −·317; D = +·199, E = +·980;
G = +·311, H = −·063, K = −·948.

A focal depth of 0·020 below normal is assumed. The evidence for this is slight, but consistent; it is impossible to satisfy the observations at Melbourne, Batavia, and Zi-ka-wei without this assumption, to which 4 of the 6 antipodal stations lend fair support, though Pompeii and Granada are discordant.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Sydney	−0·9	21·8	222	9 40	?S	(9 40)	+58	12·2	12·9
Riverview	−0·9	21·8	222	e 5 1	+ 9	e 9 16	+34	e 10·9	—
Melbourne	−1·3	28·2	221	5 10	−47	10 22	−17	12·7	16·7
Adelaide	−1·4	31·2	233	—	—	e 11 40	+ 9	e 17·1	18·7
Honolulu N.	−2·2	51·6	42	—	—	—	—	e 23·7	—
Batavia	−2·4	61·2	274	10 12	+ 8	18 16	+ 7	—	—
Zi-ka-wei	−2·5	67·1	320	e 10 40	+ 2	—	—	—	—
Colombo	−2·8	90·9	277	63 40	?L	—	—	(63·7)	66·7
De Bilt	—	144·0	341	e 22 46	?PR_1	—	—	e 67·7	82·8
Zagreb	—	144·5	326	19 35	[−12]	—	—	—	25·7
Bidston	—	144·5	350	—	—	—	—	—	85·7
Uccle	—	145·3	341	—	—	—	—	66·7	—
Strasbourg	—	146·1	337	e 19 40	[−10]	e 22 57	?PR_1	e 73·7	84·7
Zurich	—	146·8	334	e 19 37	[−14]	—	—	—	—
Pompeii	—	148·5	320	e 20 10	[+16]	—	—	—	—
Rocca di Papa	—	148·9	322	e 19 40	[−14]	—	—	—	—
Moncalieri	—	149·0	333	e 19 35	[−19]	—	—	—	—
Granada	—	160·1	341	20 29	[+21]	—	—	20·8	21·1

Additional readings and notes: Sydney P has been increased by 10m. Rocca di Papa gives also iP = +19m.46s. and +20m.10s. De Bilt eLN = +66·7m.

Aug. 3d. Readings also at 0h. (Moncalieri), 5h. (Mizusawa and near Athens), 8h. (Tiflis), 17h. (Zagreb and near Athens), 19h. (Algiers), 21h. (Zagreb (2), near Athens, and near Padova and Zurich).

Aug. 4d. Readings at 0h. (Colombo), 5h. (near Tacubaya), 9h. (Colombo), 10h. (De Bilt, Moncalieri, Rocca di Papa, Pompeii, and Strasbourg), 12h. (Zagreb), 14h. (Chicago, La Paz, and near Batavia), 18h. (Coimbra).

Aug. 5d. Readings at 2h. (near Osaka), 3h. (Coimbra), 4h. (Kew, De Bilt, Eskdalemuir, Strasbourg, Colombo, Zagreb, and Uccle), 6h. (near Batavia), 7h. (Colombo), 8h. (near Rocca di Papa), 10h. (Manila), 15h. (Taihoku), 16h. (Honolulu), 17h. (Taihoku), 23h. (La Paz).

Aug. 6d. 0h. 56m. 15s. Epicentre 35°·5N. 142°·0E.

$A = -\cdot642$, $B = +\cdot501$, $C = +\cdot581$; $D = +\cdot616$, $E = +\cdot788$; $G = -\cdot458$, $H = +\cdot358$, $K = -\cdot814$.

There are large discordances from this solution; possibly there were two shocks, but no means of reconciliation was found.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo		1·9	276	−0 12	−41	0 13	−40	e 1·0	1·6
Mizusawa	E.	3·7	350	1 40	?S	(1 40)	− 2	(3·1)	—
	N.	3·7	350	1 37	?S	(1 37)	− 5	(3·2)	—
Osaka		5·4	263	1 23	0	—	—	3·7	5·1
Kobe		5·7	263	1 40	+12	2 30	− 6	3·8	5·4
Nagasaki		10·5	258	e 0 32	−125	—	—	—	7·3
Zi-ka-wei		17·7	262	—	—	e 7 26	− 7	—	12·9
Hong Kong		27·6	249	7 8?	+64	—	—	16·4	—
Manila		28·2	227	e 6 32	+22	—	—	12·8	—
Honolulu	E.	53·7	89	—	—	e 23 54	?	e 25·0	26·2
	N.	53·7	89	—	—	e 23 47	?	e 24·8	26·2
Tiflis		72·0	310	—	—	—	—	e 40·8	48·8
Konigsberg	N.	76·7	331	—	—	—	—	e 41·6	46·5
Hamburg		81·8	335	—	—	—	—	e 45·8	—
Dyce	N.	82·5	343	i 13 34	+61	i 24 34	+102	47·1	53·1
Vienna		83·2	329	—	—	—	—	e 49·0	58·8
Edinburgh		84·0	342	—	—	e 23 15	+ 7	—	57·8
Eskdalemuir		84·4	342	e 11 45	−59	e 22 20	−52	41·8	56·8
De Bilt		84·7	336	—	—	e 23 17	+ 1	e 45·8	55·8
Zagreb		85·2	326	e 11 45	−64	—	—	e 47·8	56·8
Uccle		86·0	336	—	—	e 23 15	−15	e 45·8	—
Bidston		86·1	340	15 10	?	24 25	+54	—	59·8
Strasbourg		86·7	332	e 13 0	+ 3	e 23 35	− 3	23·8	—
Kew		87·0	339	—	—	—	—	—	53·8
Oxford		87·0	339	—	—	—	—	—	58·2
Paris		88·4	336	—	—	—	—	e 49·8	60·8
Rocca di Papa		89·9	325	—	—	—	—	e 55·2	60·2
Tortosa	N.	95·9	333	—	—	—	—	e 53·8	57·9
Coimbra		99·5	339	—	—	—	—	54·8	—
La Paz		147·1	63	20 0	[+ 9]	—	—	—	—

Additional readings: Osaka gives also MN = +5·5m. Kobe MN = +4·9m. Zi-ka-wei MN = +11·9m. Hong Kong P is doubtful. Tiflis MN = +49·8m. Eskdalemuir MN = +54·8m. De Bilt MN = +52·2m. Zagreb MNW = +50·8m. Rocca di Papa L = +59·0m. Tortosa readings are diminished by 1h. Coimbra e = +45m.5s.

Aug. 6d. 6h. 1m. 20s. Epicentre 34°·0S. 73°·0W. (as on 1922 May 21d.).

$A = +\cdot242$, $B = -\cdot793$, $C = -\cdot559$; $D = -\cdot956$, $E = -\cdot292$; $G = -\cdot163$, $H = +\cdot535$, $K = -\cdot829$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mendoza	4·1	74	2 16	?S	(2 16)	+23	3·5	3·8
Cipolletti	6·3	143	(0 40)	−56	—	—	0·7	0·9
Pilar	8·0	76	2.10	+ 9	—	—	3·3	4·0
Andalgala	8·6	43	2 10	0	(4 4)	+11	4·9	5·9
Chacareta E.	12·1	97	3 34	+34	—	—	4·8	5·1
La Paz	18·0	15	e 4 13	− 4	i 7 38	− 2	9·6	11·8
Eskdalemuir	107·3	34	—	—	—	—	40·7	—
Uccle	108·6	41	—	—	—	—	—	58·7
De Bilt	109·7	41	—	—	—	—	e 45·7	47·6

Additional readings and notes: Pilar gives also MN = +3·6m. Andalgala MN = +6·1m., S is given as PN, and all readings are increased by 4m. Chacareta PN = +3m.28s.

Aug. 6d. Readings also at 1h. (La Paz and Zi-ka-wei), 20h. (Apia).

1922. Aug. 7d. 12h. 22m. 20s. Epicentre 1°·0N. 147°·0E.
(as on 1919 April 22d.).

$A = -\cdot839$, $B = +\cdot545$, $C = +\cdot017$; $D = +\cdot545$, $E = +\cdot839$; $G = -\cdot015$, $H = +\cdot010$, $K = -1\cdot000$.

There may have been a second shock about 2 minutes later, recorded at Manila, Sydney, and Tokyo.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	29·1	300	e 8 52	+153	—	—	—	—
Riverview	35·0	174	e 6 46	−27	—	—	e 13·5	—
Sydney	35·0	174	10 10	+177	14 34	?SR_1	18·0	21·4
Osaka	35·2	345	7 24	+ 9	—	—	—	15·8
Tokyo	35·4	350	e 9 42	+145	—	—	—	—
Adelaide	36·8	191	—	—	i 12 40	−41	e 18·8	20·5
Hong Kong	38·4	307	7 44	+ 3	(13 50)	+ 6	13·8	—
Zi-ka-wei	38·7	325	e 7 48	+ 4	e 13 58	+10	—	21·5
Melbourne	38·8	183	—	—	e 8 40?	?PR_1	17·1	28·6
Batavia	40·7	262	9 24	?PR_1	—	—	—	—
Perth	44·2	219	8 46	+19	14 57	− 8	24·1	25·0
Honolulu E.	57·3	68	18 5	?S	(18 5)	+15	29·3	31·0
N.	57·3	68	18 30	?S	(18 30)	+40	28·2	31·7
Colombo	67·2	276	26 10	?L	—	—	(26·2)	30·2
Hamburg	114·8	334	e 17 40	?	—	—	62·7	—
Zagreb	116·1	324	e 20 10	?PR_1	—	—	67·7	—
De Bilt	118·0	335	e 23 40	?	e 30 16	+102	e 62·7	—
Eskdalemuir	118·7	341	20 40	?PR_1	e 30 26	+106	62·7	—
Strasbourg	119·2	330	e 20 40	?PR_1	—	—	e 68·0	—
Uccle	119·2	334	—	—	—	—	—	62·7
Rocca di Papa	120·6	320	20 40	?PR_1	—	—	e 77·2	—

Additional readings: Osaka gives also MN = +16·0m. Melbourne SR_1 = +12m.46s. Perth PR_1 = +10m.22s., SR_1 = +17m.36s. Honolulu PR_1N = +19m.50s., SN = +24m.20s., SR_1E = +26m.35s., SR_1N = +26m.18s., T_0 = 12h.33m.28s. Eskdalemuir e = +23m.16s. and +26m.6s. Rocca di Papa PV = +22m.4s.

Aug. 7d. Readings also at 0h. (Manila), 1h. (La Paz and Wellington), 3h. (Tiflis), 7h. (Rocca di Papa and Zagreb), 8h. (Hamburg, Strasbourg, and De Bilt), 10h. (Zante, Rocca di Papa, and Zagreb), 13h. (near Tacubaya and near La Paz), 21h. (Batavia).

Aug. 8d. 3h. 49m. 6s. Epicentre 37°·5N. 23°·0E.

A = +·730, B = +·310, C = +·609; D = +·391, E = −·921; G = +·560, H = +·238, K = −·793.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	0·7	51	i 0 13	+ 2	—	—	0·3	0·4
Mostar	7·0	328	e 0 44	−62	i 2 56	−14	—	3·5
Pompeii	7·3	299	e 2 9	+18	4 34	?L	(4·6)	—
Belgrade	7·5	347	e 1 58	+ 4	e 4 7	?L	(e 4·1)	5·2
Rocca di Papa	9·0	302	i 2 24	+ 8	5 30	?L	(5·5)	6·9
Zagreb N.E.	9·8	330	2 31	+ 4	i 4 58	?L	(i 5·0)	6·9
N.W.	9·8	330	2 29	+ 2	i 5 1	?L	(i 5·0)	6·7
Helwan	10·3	135	—	—	i 4 20	−17	—	4·9
Florence	10·9	309	2 25	−18	—	—	—	5·8
Padova	11·5	317	2 24	−28	7 40	?L	(7·7)	9·8
Vienna	11·5	338	e 2 57	+ 5	e 5 9	+ 2	—	10·9
Lemberg	12·3	3	e 3 24	+21	—	—	e 8·5	8·9
Innsbruck	13·0	323	—	—	—	—	e 10·9	—
Zurich E.	14·5	318	e 3 31	− 2	i 6 34	+14	—	—
N.	14·5	318	e 3 38	+ 5	e 6 35	+15	—	—
Strasbourg	15·6	320	3 54	+ 7	e 6 38	− 8	e 8·9	9·8
Besançon	15·8	313	e 3 57	+ 8	7 6	+16	9·9	—
Algiers	15·9	273	e 4 1	+10	7 7	+14	—	15·9
Tiflis	17·2	69	e 3 54	−13	e 7 11	−11	e 9·5	11·3
Konigsberg	17·4	355	i 4 9	− 1	e 7 21	− 6	e 9·9	11·2
Tortosa	17·7	286	4 21	+ 8	7 50	+17	9·7	12·9
Hamburg	18·5	335	i 4 23	0	e 8 6	−15	e 10·7	15·0
Paris	18·6	314	e 4 29	+ 5	e 7 5	−48	10·9	—
Uccle	18·8	321	e 4 28	+ 1	e 8 0	+ 2	10·1	—
De Bilt	19·2	325	4 37	+ 6	8 12	+ 6	10·4	13·4
Granada	21·1	277	e 5 5	+11	9 1	+15	e 13·9	17·7
Kew	21·5	318	—	—	—	—	—	15·9
Oxford	22·2	318	i 5 5	− 2	i 9 9	0	12·4	15·2
Upsala	22·6	354	e 5 6	− 6	e 9 17	0	13·0	14·2
West Bromwich	23·0	319	e 5 12	− 5	9 22	− 3	—	15·5
Stonyhurst	23·9	321	—	—	9 42	0	13·9	16·9
Bidston	24·0	320	6 27	+59	10 44	+60	—	17·2
Coimbra	24·5	286	5 33	0	9 55	+ 1	e 14·2	—
Eskdalemuir	25·1	324	5 36	− 3	10 4	− 1	12·7	16·9
Edinburgh	25·4	325	5 36	− 6	10 12	+ 1	—	18·1
Dyce N.	25·7	328	5 33	−12	9 13	−63	—	15·0

Additional readings: Mostar gives also iP = +1m.37s. Belgrade iP = +2m.23s., MN = +5·8m. Zagreb eNW = +3m.19s., eNE = +3m.37s. Padova MN = +8·8m. Vienna S is given as e simply. Also iS? = +7m.2s., iSR, ? = +7m.58s. Zurich iN = +3m.43s. Strasbourg MN = +11·8m. Tiflis MN = +12·9m. Konigsberg SN = +7m.28s., PS = +7m.36s., MN = +12·0m. Hamburg MN = +13·8m. De Bilt MN = +13·1m., T_o = 3h.49m.15s. Granada 1 = +5m.47s. and +5m.59s. Upsala MN = +15·4m. Coimbra eLN = +13·4m., T_o = 3h.49m.10s.

Aug. 8d. Readings also at 2h. (near Athens), 6h. (Tacubaya), 7h., 8h., and 10h. (near Athens), 11h. (La Paz and near Athens), 12h. (Coimbra), 14h. (Zi-ka-wei, Calcutta, and near Athens), 15h. (De Bilt and near Athens), 21h. (near Osaka), 22h. (Barcelona and near Tortosa).

Aug. 9d. Readings at 0h. (Tiflis), 1h. (near Tacubaya), 3h. (Colombo and Batavia), 6h. (Manila, Batavia, and Zi-ka-wei), 9h. (near Tokyo and near Padova, Innsbruck, and Zurich), 10h. (Zurich and near Tacubaya (2)), 16h. (La Paz), 17h. (Ottawa), 19h. and 21h. (Athens).

Aug. 10d. Readings at 0h. (Athens), 6h. (La Paz and Eskdalemuir), 9h. (Athens), 10h. (near Tacubaya), 11h. (Athens, Batavia (2), and near Manila), 14h. (Tiflis), 16h. (Athens), 17h. (Athens and near Mizusawa), 20h. (near Manila), 23h. (Athens).

1922. Aug. 11d. 8h. 19m. 36s. Epicentre 36°·0N. 28°·0E.

(as on 1921 Jan. 27d.).

A = +·714, B = +·380, C = +·588; D = +·470, E = −·883;
G = +·519, H = +·276, K = −·809.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		3·9	302	e 1 3	+ 2	2 7	+20	2·2	2·4
Helwan		6·7	154	1 37	− 5	i 2 47	−15	—	11·5
Belgrade		10·5	329	e 2 32	− 5	i 4 23	−20	—	7·6
Mostar		10·7	316	e 2 51	+11	(e 4 15)	−33	(e 6·6)	8·1
Pompeii		11·6	298	e 3 0	+ 7	5 30	+21	7·4	8·9
Rocca di Papa	E.	13·2	301	e 3 6	−10	5 42	− 7	i 7·1	—
	N.	13·2	301	e 3 0	−16	—	—	i 7·4	10·2
Zagreb	N.E.	13·3	321	3 19	+ 2	i 6 3	+12	—	8·0
	N.W.	13·3	321	—	—	i 6 6	+15	—	8·9
Lemberg		14·1	350	e 3 48	+21	e 6 42	+32	e 8·1	9·7
Florence		15·0	306	3 24	−15	6 29	− 3	—	9·7
Vienna		15·0	329	i 3 45	+ 6	i 6 48	+16	—	9·9
Padova		15·4	312	3 44	0	6 54	+13	—	11·9
Innsbruck		16·7	318	i 4 4	+ 3	e 7 16	+ 5	8·7	9·7
Zurich	E.	18·3	314	4 20	− 1	7 47	0	—	—
Marseilles		18·8	300	4 24	− 3	i 8 3	+ 5	9·9	10·7
Strasbourg		19·4	317	4 34	0	8 15	+ 5	e 10·4	11·6
Konigsberg	Z.	19·5	347	4 38	+ 3	8 32	+19	e 9·7	13·2
Besançon		19·8	312	e 4 43	+ 4	8 23	+ 4	10·4	—
Algiers		20·0	280	i 4 36	− 5	8 9	−14	9·4	12·9
Barcelona		20·8	293	i 4 45	− 6	i 8 35	− 5	e 10·5	—
Puy de Dome		21·2	306	5 4	+ 9	9 4	+16	11·9	—
Hamburg		21·6	330	e 4 59	− 1	e 8 59	+ 2	11·6	15·9
Tortosa	N.	22·0	291	4 54	−11	8 54	−11	9·6	14·0
Uccle		22·5	318	e 5 6	− 5	i 9 10	− 5	10·4	12·3
Paris		22·6	313	e 5 8	− 4	i 9 14	− 3	12·0	12·4
De Bilt		22·8	322	5 11	− 4	9 23	+ 2	10·0	15·7
Upsala		24·8	348	5 32	− 4	9 57	− 2	e 12·8	16·7
Granada		25·3	282	i 5 45	+ 4	i 10 4	− 5	i 14·8	19·6
Kew		25·3	316	10 24	?S	(10 24)	+15	—	16·4
Oxford		26·1	317	5 40	− 9	10 13	−11	12·6	16·7
West Bromwich		26·8	318	6 9	+13	10 19	−18	—	17·4
San Fernando		27·5	281	6 12	+ 9	10 24	−26	—	20·2
Rio Tinto		27·6	284	12 24	?L	—	—	(12·4)	22·4
Stonyhurst		27·6	320	6 42	+38	10 42	−10	15·5	16·1
Bidston		27·8	319	7 44	+98	11 29	+34	—	18·2
Bergen		28·4	336	8 24	?	—	—	17·4	—
Eskdalemuir		28·7	322	5 54	−21	10 48	−24	13·4	16·5
Coimbra	E.	28·8	290	e 6 12	− 4	i 10 52	−21	e 17·6	18·2
	N.	28·8	290	—	—	—	—	15·1	19·0
Edinburgh		29·0	323	e 6 57	+39	11 32	+15	—	17·7
Dyce	N.	29·2	326	5 50	−30	10 15	−65	14·3	20·6
Simla	E.	40·8	81	e 14 12	?S	(e 14 12)	− 6	—	—
Kodaikanal		51·5	107	16 36	?S	(16 36)	− 2	27·8	39·1
Colombo		55·5	109	12 54	?PR_1	22 54	?SR_1	32·9	38·4
Johannesburg		62·2	180	—	—	—	—	32·4	—
Capetown		70·5	188	32 24	?L	37 24	?	(32·4)	38·9
Ottawa		73·6	315	e 11 42	+ 2	i 21 20	+11	e 34·4	—
Zi-ka-wei		74·7	62	e 12 0	+13	—	—	—	74·7
Ithaca		75·7	312	—	—	i 21 35	+ 1	e 38·4	—
Toronto		76·6	315	—	—	—	—	e 39·1	44·6
Georgetown		78·1	310	e 11 51	−17	i 22 16	+15	—	—
Washington		78·1	310	—	—	23 8	+67	38·4	—
Ann Arbor		80·0	316	e 11 12	−67	i 22 18	− 5	38·4	—
Chicago		82·1	318	12 55	+24	22 41	− 6	36·9	—
Manila		83·8	77	—	—	e 21 24	−103	—	—
Batavia		84·7	102	—	—	e 23 1	− 15	—	—
Victoria		91·8	341	—	—	—	—	47·9	55·8
La Paz		104·5	260	e 22 35	?	24 41	−117	54·9	58·7
Mendoza		113·3	244	59 54	?L	—	—	66·3	72·9
Cipolletti		115·9	239	64 12	?L	—	—	70·8	71·8

Additional readings: Athens gives also i = +1m.7s. and +1m.19s. Belgrade iP = +3m.58s. Mostar eS is given as a second eP, and eL as eS. Zagreb iNE = +3m.50s. and +5m.15s., iNW = +3m.51s. and +5m.19s. Vienna PN = +3m.46s., iSEN = +8m.30s., iS is given as i simply. Konigsberg PN = +4m.40s., PE = +4m.43s., iZ = +5m.18s., ME = +12·6m., MN = +14·2m. Hamburg MNZ = +15·1m. Uccle MN = +13·3m. De Bilt MN = +13·4m. Upsala MN = +17·4m. San Fernando MN = +17·7m. Bergen P has been increased by 10m. Coimbra iE = +11m.16s., iN = +13m.14s., T_o = 8h.19m.55s. Simla ePN = +14m.24s. (O−C = +6s.). Colombo S = +25m.54s., L = +35·9m. La Paz first two readings given as eP? and P?.

Aug. 11d. 13h. 38m. 0s. Epicentre 55°·0N. 167°·0E.

A = −·559, B = +·129, C = +·819; D = +·225, E = +·974; G = −·798, H = +·184, K = −·574.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		17·3	251	4 17	+ 8	—	—	9·2	10·4
Mizusawa	E.	23·5	238	5 23	0	9 36	+ 1	—	—
Tokyo		26·9	235	e 4 0	−117	(e 10 44)	+ 5	e 10·7	—
Kobe		29·9	241	e 9 57	?S	(9 57)	−95	—	15·6
Sitka	E.	31·3	63	—	—	—	—	e 17·4	11·6
	N.	31·3	63	—	—	—	—	e 18·2	19·4
Zi-ka-wei		39·9	254	e 7 38	−16	—	—	—	26·1
Victoria		41·9	69	14 14	?S	(14 14)	−20	21·2	24·2
Honolulu	E.	42·6	129	—	—	14 45	+ 2	17·9	19·5
Berkeley	E.	49·2	80	—	—	—	—	e 25·0	—
Hong Kong		50·8	250	16 30	?S	(16 30)	+ 1	—	—
Manila		53·7	240	e 10 0	+29	—	—	—	—
Upsala		62·6	344	e 10 25	− 4	e 18 50	− 6	e 35·7	39·0
Chicago		64·4	54	18 40	?S	(18 40)	−38	35·0	—
Simla	N.	64·8	289	—	—	—	—	e 33·4	—
Ann Arbor		65·7	50	—	—	i 19 42	+ 9	35·0	—
Ottawa		66·5	44	—	—	e 19 45	+ 1	41·0	—
Toronto		66·5	47	19 42	?S	(19 42)	− 2	e 35·3	38·5
Konigsberg		66·8	340	—	—	(e 19 49)	+ 1	e 19·8	39·0
Dyce	N.	67·4	355	10 51	− 9	19 6	−49	31·1	—
Ithaca		68·7	46	19 37	?S	(19 37)	−33	36·0	—
Edinburgh		68·8	355	—	—	i 20 18	+ 6	—	—
Eskdalemuir		69·4	355	e 11 16	+ 3	20 19	0	32·5	38·1
Hamburg		69·8	347	e 12 0	+44	i 20 30	+ 6	e 36·0	53·0
Bidston		71·3	354	12 20	− 5	21 40	+58	—	45·0
Georgetown	E.	71·4	48	—	—	—	—	39·7	—
Tiflis		71·6	319	—	—	e 20 30	−15	e 34·3	42·5
De Bilt	E.	71·8	349	—	—	20 51	+ 3	e 33·0	58·2
	N.	71·8	349	e 11 30	+ 2	20 50	+ 2	e 38·0	59·5
Oxford		72·8	354	11 40	+ 5	i 21 0	0	40·0	57·5
Kew		73·0	354	—	—	—	—	—	70·0
Uccle		73·2	350	e 11 30	− 7	e 21 3	− 1	e 37·0	41·0
Vienna		73·8	340	i 11 50	+ 9	21 16	+ 4	e 43·0	51·0
Strasbourg		75·0	347	e 12 0	+11	—	—	37·0	—
Paris		75·4	351	e 12 21	+30	e 21 29	− 1	e 39·0	49·0
Zagreb		76·3	340	e 12 0	+ 3	21 40	− 1	e 34·0	47·0
Batavia		78·7	241	−0 13	?	—	—	—	—
Rocca di Papa		80·8	341	12 18	− 6	22 24	− 9	e 47·9	58·1
Pompeii		81·4	340	e 13 46	+79	—	—	—	—
Kodaikanal		81·4	275	45 18	?L	—	—	(45·3)	—
Colombo		82·7	272	47 30	?L	—	—	(47·5)	53·0
Tortosa	N.	83·5	350	12 47	+ 8	22 55	− 8	e 40·0	57·2
Coimbra		84·8	357	—	—	e 28 0	?SR_1	e 42·0	—
Algiers		87·2	348	e 12 54	− 6	23 34	− 9	—	60·0
Granada		87·5	354	13 38	+36	23 50	+ 3	e 48·0	51·7
Riverview		89·9	192	—	—	e 37 19	?	e 43·1	—

Additional readings and notes: Mizusawa gives also PN = +5m.22s. Kobe MN = +15·1m. Victoria S = +17m.43s. Honolulu LN = +18·0m., MN = +19·6m. Berkeley eE = +20m.0s., eN = +21m.42s. Chicago S? = +25m.33s. Simla eE = +27m.24s. Ann Arbor iN = +19m.0s. Toronto S = +27m.30s., eL = +42·5m., and +48·8m. Ithaca eN = +21m.5s., S?N = +28m.25s. Eskdalemuir e = +25m.0s., MN = +36·5m. Hamburg MN = +31·0m. Bidston S = +18m.28s. Georgetown eE = +18m.0s., eN = +18m.29s., LN = +43·6m. Tiflis e = +15m.0s., + +16m.24s., +21m.24s., and +25m.6s., MN = +49·9m. Zagreb MNW = +45·6m. Rocca di Papa iL = +52·1m.

Aug. 11d. Readings also at 3h. (Taihoku), 6h. (Mendoza), 8h. (near Athens), 9h. (Riverview, near Tokyo, and Mizusawa), 10h. (De Bilt, Vienna, Strasbourg, Rocca di Papa, Hamburg, Zagreb, and near Athens), 11h. (Tiflis, De Bilt, and Uccle), 17h. (near Athens), 19h. (Manila and Batavia), 21h. (Lick), 22h. (Granada).

Aug. 12d. Readings at 0h. (Granada), 10h. (near Tacubaya (2)), 12h. (near Athens and near Nagasaki), 14h. (Athens), 19h. (Zagreb and near Belgrade), 20h. (Rocca di Papa), 22h. (La Paz).

1922. Aug. 13d. 0h. 9m. 50s. Epicentre 36°·0N. 28°·0E.

(as on Aug. 11d.; but see Note at end).

A = +·714, B = +·380, C = +·588; D = +·470, E = −·883;
G = +·519, H = +·276, K = −·809.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		3·9	302	e 1 6	+ 5	i 1 54	+ 7	—	4·3
Helwan		6·7	154	i 1 38	− 4	i 2 49	−13	—	9·2
Belgrade		10·5	329	i 2 42	+ 5	i 4 45	+ 2	—	7·0
Mostar		10·7	316	i 2 36	− 4	5 5	+17	—	7·6
Pompeii		11·6	298	e 2 55	+ 2	4 0	?	6·2	12·2
Rocca di Papa		13·2	301	e 3 10	− 6	i 5 40	− 9	—	5·9
Zagreb	N.E.	13·3	321	e 3 22	+ 5	i 5 57	+ 6	—	8·1
	N.W.	13·3	321	e 3 17	0	i 5 52	+ 1	—	10·0
Lemberg		14·1	350	e 3 43	+16	e 6 38	+28	e 8·1	9·7
Florence		15·0	306	3 40	+ 1	6 17	−15	—	10·7
Vienna		15·0	329	i 3 40	+ 1	i 6 33	+ 1	i 8·0	—
Padova		15·4	312	3 48	+ 4	(6 17)	−24	(7·5)	9·0
Innsbruck		16·7	318	i 4 5	+ 4	i 7 17	+ 6	e 9·0	9·8
Zurich		18·3	314	e 4 21	0	i 7 42	− 5	10·0	—
Marseilles		18·8	300	4 29	+ 2	i 7 52	− 6	9·7	10·2
Strasbourg		19·4	317	4 31	− 3	e 8 6	− 4	9·8	11·6
Konigsberg		19·5	347	4 35	0	8 16	+ 3	e 10·0	12·1
Besançon		19·8	312	e 4 35	− 4	i 8 17	− 2	11·2	—
Algiers		20·0	280	i 4 36	− 5	8 8	−15	9·7	13·7
Barcelona		20·8	293	4 46	− 5	i 8 38	− 2	e 10·4	12·8
Hamburg		21·6	330	e 4 57	− 3	e 8 46	−11	e 11·6	13·2
Tortosa	N.	22·0	291	4 54	−11	i 8 46	−19	9·6	14·1
Uccle		22·5	318	e 4 59	−12	i 9 8	− 7	i 10·2	17·2
Paris		22·6	313	e 5 9	− 3	i 9 9	− 8	e 11·7	15·2
De Bilt		22·8	322	e 5 9	− 6	9 17	− 4	10·1	15·7
Upsala		24·8	348	i 5 29	− 7	i 9 55	− 4	e 13·3	17·1
Kew		25·3	316	9 10	?S	(9 10)	−59	—	15·2
Granada		25·3	282	i 5 37	− 4	i 10 3	− 6	15·7	19·5
Oxford		26·1	317	5 39	−10	10 12	−12	13·2	16·7
San Fernando		27·5	281	5 55	− 8	11 52	+62	—	20·9
Rio Tinto		27·6	284	11 10	?S	(11 10)	+18	—	23·2
Stonyhurst		27·6	320	6 4	0	11 16	+24	15·7	16·4
Bergen		28·4	336	e 6 10	− 2	—	—	—	—
Eskdalemuir		28·7	322	e 6 7	− 8	i 10 47	−25	13·2	23·2
Coimbra	E.	28·8	290	—	—	i 11 18	+ 5	e 16·2	18·2
	N.	28·8	290	6 11	+ 5	10 53	−20	14·7	18·9
Edinburgh		29·0	323	6 13	− 5	11 1	−16	12·2	17·0
Dyce		29·2	326	e 5 47	−33	10 56	−24	13·0	15·8
Simla	E.	40·8	81	7 40	−21	13 46	−32	22·7	—
	N.	40·8	81	10 34	?PR_1	—	—	24·2	—
Dehra Dun		41·8	82	7 10	−59	—	—	—	—
Azores		42·4	288	14 22	?S	(14 22)	−18	—	29·9
Bombay		42·8	100	7 25	−52	—	—	—	—
Kodaikanal		51·5	107	15 16	?S	(15 16)	−82	31·5	38·7
Calcutta	E.	53·4	87	9 16	−13	16 52	− 9	25·5	—
	N.	53·4	87	9 14	−15	16 45	−16	—	—
Colombo		55·5	109	10 10	+27	26 52?	?L	35·5	39·2
Johannesburg		62·2	180	—	—	—	—	31·2	33·9
Capetown		70·5	188	—	—	20 14	−18	38·1	38·8
Northfield		72·4	314	—	—	20 44	−11	38·2	—
Ottawa		73·6	315	11 40	0	21 10	+ 1	35·2	—
Hong Kong		74·1	75	—	—	21 25	+10	—	—
Ithaca		75·7	312	—	—	e 21 33	− 1	e 36·2	—
Toronto		76·6	315	—	—	21 16	−28	e 34·1	47·9
Georgetown		78·1	310	11 26	−42	i 22 5	+ 4	e 35·5	—
Washington		78·1	310	—	—	23 0	+59	e 38·2	—
Taihoku		78·2	69	—	—	e 22 10	+ 8	—	—
Ann Arbor		80·0	316	12 10	− 9	i 22 4	−19	48·5	—
Kobe	E.	82·0	52	—	—	—	—	—	52·2
Chicago		82·1	318	12 47	+16	22 43	− 4	35·2	—
Osaka		82·2	52	11 39	−52	—	—	—	25·4
Manila		83·8	77	e 12 50	+ 9	23 16	+ 9	42·2	45·8
Tokyo		84·3	50	12 30	−14	(e 22 25)	−46	e 22·4	25·5
Batavia		84·7	102	e 12 35	−11	i 22 57	−19	e 65·2	—
Sitka	E.	85·9	351	—	—	—	—	e 42·2	45·3
	N.	85·9	351	—	—	—	—	e 43·0	53·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria		91·8	341	25 24	?S	(25 24)	+51	e 47·7	54·8
Lick	E.	101·2	336	—	—	—	—	e 58·5	—
Berkeley	E.	101·2	337	—	—	e 38 52	?	e 53·2	57·0
La Paz		104·5	260	18 26	?PR_1	28 48	+130	47·5	56·0
Perth		106·6	118	—	—	—	—	54·4	—
Andalgala	E.	109·1	248	—	—	—	—	59·8	63·3
	N.	109·1	248	30 10	?	—	—	53·5	64·9
Pilar		109·4	243	34 40	?	—	—	56·6	76·1
Mendoza		113·3	244	30 22	?	—	—	60·6	75·7
Cipolletti		115·9	239	39 58	?	—	—	59·4	73·1
Honolulu	N.	122·4	6	—	—	—	—	e 55·2	73·4
Adelaide		124·7	110	—	—	e 27 10?	−134	i 74·0	83·7
Melbourne		130·5	111	—	—	e 31 10	?	e 73·0	84·8
Riverview		134·0	103	—	—	e 41 25	?SR_1	e 60·7	—

Additional readings: Athens gives also i = +1m.13s., iP = +1m.17s, i = +1m.30s., MN = +2·5m., T_0 = 0h.9m.56s. Belgrade iP = +3m.38s., MN = +9·3m. Mostar iP = +2m.46s. Rocca di Papa e = +3m.4s., i = +3m.16s. Zagreb iNE = +4m.4s. and +4m.29s., iNW = +4m.32s. Vienna gives very many i readings, also iSEZ = +6m.38s., iLN = +7·9m., iLZ = +9·6m. Padova PR_1 = +5m.17s., SR_1 = +7m.17s. Zurich i = +5m.6s. Strasbourg PN = +4m.34s. (O−C = 0s.), MN = +12·2m., MZ = +12·7m. Konigsberg iEN = +5m.37s., SZ = +8m.18s., MN = +13·1m., MZ = +13·2m. Algiers MN = +15·7m. Barcelona PR_1 = +5m.14s., MN = +12·0m. Hamburg MN = +15·4m., MZ = +15·0m. Uccle iP = +5m.5s., MN = +13·3m. Paris MN = +12·2m. De Bilt i = +5m.19s., MN = +13·4m. Upsala MN = +17·2m. Granada MN = +18·4m. San Fernando MN = +17·7m. Rio Tinto readings are given as for 12d.0h. Eskdalemuir MN = +14·4m. Coimbra iN = +13m.13s., T_0 = 0h.10m.5s. Johannesburg readings given as for 12d. Ithaca eS? = +22m.34s. Toronto e = +13m.34s. and +16m.10s., eL = +47·3m., +77·4m., and +94·0m. Georgetown LEN = +38·2m. Ann Arbor L = +38·2m. Kobe MN = +51·6m. Manila MN = +46·6m. Tokyo MN = +24·6m. Batavia i = +14m.14s. and +19m.52s. Sitka eLN = +52·1m. Victoria L = +39·9m., eL = +51·9m. Pilar MN = +66·7m. Mendoza readings diminished by 4h. Honolulu eE = +52m.10s. Adelaide gives also a large number of e readings.

Comparison of August 13d.0h. and August 11d.8h.

So many stations record both these shocks that a direct comparison is interesting. Omitting large residuals, and retaining only good determinations of P and S on both occasions, differences in the sense August 13—August 11 are as below:—

Δ	Az.	P.	S.	Δ	Az.	P.	S.	Δ	Az.	P.	S.
°	°	s.	s.	°	°	s.	s.	°	°	s.	s.
20°0	280	0	− 1	19·8	312	−8	− 6	13·3	321	0	−11
25·3	282	− 8	− 1	22·6	313	+1	− 5	28·7	322	+13	− 1
28·8	290	+ 9	+14	18·3	314	+1	− 5	22·8	322	− 2	− 6
22·0	291	0	−13	73·6	315	−2	−10	10·5	329	+10	+22
20·8	293	+ 1	+ 3	26·1	317	−1	− 1	15·0	329	− 5	−15
18·8	300	+ 5	−11	19·4	317	−3	− 9	21·6	330	− 2	−13
13·2	301	+ 7	− 2	16·7	318	+5	+ 1	19·5	347	− 3	−16
3·9	302	+ 3	−13	22·5	318	−7	− 2	24·8	348	− 3	− 2
15·0	306	+16	−12	82·1	318	−8	+ 2	14·1	350	− 5	− 4
18·6	294	+ 4	− 4	33·5	316	−2	− 4	18·9	333	0	− 5

The P differences are nearly zero in the mean, but the S differences are consistently negative. Let us suppose that this indicates a change in epicentre. The mean Δ is 23° and S−P = −5s. Hence we should have (taking August 11 as the standard) for August 13

$$\delta\Delta = -0°{\cdot}6 \qquad \delta P = -7s. \qquad \delta S = -12s.$$

the displacement being in azimuth 315° or NW. If the epicentre is thus adjusted the residuals for P will all be increased by 7s., and being zero before will now be +7: those for S (−5s. before) will be increased by +12s., and become +7s. as for P. This 7 sec. must be thrown on the T_0 either of Aug. 11 or Aug. 13. But on re-examination of the residuals for correction to T_0 in both cases the adopted determination was found closely correct. It seems therefore more probable that the differences are accidental. The mean numerical difference for P is ±4·7s., and for S ±7·4s.

COMPARISON OF AUG. 13d.0h. AND AUG. 13d.12h.

Making a similar direct comparison for the 2 earthquakes on Aug. 13, the means of 18 accordant determinations are for 12h. −0h.: $\delta P = +4{\cdot}6$s., $\delta S = +5{\cdot}2$s. Here no sensible change in epicentre is indicated, but suspicion is thrown on the T_0. On recalculating that for Aug. 13d. 12h. a correction of +2·5s. was found which would reduce the above discordances by one half. Hence the T_0 for Aug. 13d.12h. should probably be 12h.46s.3s. at least. But as regards the epicentres for the three shocks, they seem to be closely the same, within a small fraction of 1°.

Aug. 13d. 12h. 46m. 0s. Epicentre 36°·0N. 28°·0E. (as at 0h.).

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·9	302	e 1 8	+ 7	1 56	+ 9	2·1	2·3
Helwan	6·7	154	1 44	+ 2	2 50	− 12	—	5·8
Belgrade	10·5	329	i 2 40	+ 3	i 4 49	+ 6	—	6·5
Rocca di Papa	13·2	301	i 3 12	− 4	e 7 24	?L	e 9·2	12·6
Zagreb N.E.	13·3	321	e 3 27	+10	i 6 6	+15	—	8·1
N.W.	13·3	321	e 3 21	+ 4	—	—	—	10·0
Lemberg	14·1	350	3 54	+27	e 6 54	+44	e 9·3	9·7
Tiflis	14·2	61	e 4 0	+31	e 7 0	+47	—	11·6
Vienna	15·0	329	3 41	+ 2	6 39	+ 7	e 7·5	11·0
Florence	15·0	306	5 35	?	8 0	?L	(8·0)	9·7
Padova	15·4	312	4 0	+16	(7 7)	+26	—	10·0
Innsbruck	16·7	318	i 4 5	+ 4	e 7 15	+ 4	e 9·6	9·9
Zurich	18·3	314	e 4 21	0	e 7 48	+ 1	—	—
Marseilles	18·8	300	4 33	+ 6	8 0	+ 2	10·0	11·0
Strasbourg	19·4	317	4 35	+ 1	8 9	− 1	e 9·0	14·7
Konigsberg	19·5	347	i 3 40	−55	8 19	+ 6	e 11·0	14·2
Besançon	19·8	312	e 4 34?	− 5	8 18	− 1	11·0	—
Algiers	20·0	280	4 36	− 5	8 13	−10	—	17·0
Barcelona	20·8	293	e 4 54	+ 3	e 8 37	− 3	e 10·8	16·3
Hamburg	21·6	330	e 4 59	− 1	—	—	e 10·5	13·4
Tortosa	22·0	291	5 0	− 5	8 58	− 7	—	16·3
Uccle	22·5	318	e 5 7	− 4	9 13	− 2	e 11·5	13·2
Paris	22·6	313	e 5 13	+ 1	e 9 15	− 2	e 13·0	—
De Bilt	22·8	322	e 5 59	+44	9 20	− 1	9·9	15·8
Upsala	24·8	348	e 5 32	− 4	e 10 1	+ 2	e 13·5	16·8
Kew	25·3	316	10 0	?S	(10 0)	− 9	—	15·0
Granada	25·3	282	5 49	+ 8	10 3	− 6	—	—
Oxford	26·1	317	5 49	0	10 24	0	15·0	16·7
Stonyhurst	27·6	320	e 3 30	?	5 0	?P	—	16·5
Bidston	27·8	319	—	—	—	—	14·0	—
Eskdalemuir	28·7	322	e 7 0	+45	e 10 55	−17	14·0	16·6
Coimbra	28·8	290	—	—	—	—	15·0	21·5
Edinburgh	29·0	323	—	—	e 11 31	+14	—	21·5
Dyce N.	29·2	326	i 7 35	+75	i 11 5	−15	13·2	16·0
Kodaikanal	51·5	107	29 36	?L	—	—	(29·6)	—
Colombo	55·5	109	27 0	?L	33 0	?	(27·0)	38·0
Cape Town	70·5	188	39 10	?L	—	—	(39·2)	—

Additional readings: Athens gives also MN = +2·5m. Belgrade iP = +3m.25s. Rocca di Papa eP = +3m.42s. Zagreb iNE = +4m.20s. Tiflis S is given as e, also MN = +13·5m. Strasbourg MN = +11·7m. Hamburg MN = +14·3m., MZ = +16·6m. De Bilt P is given as e, also MN = +13·4m. Upsala MN = +17·4m. Coimbra MN = +20·0m. Dyce readings all given as i simply, also i = +12m.0s. Colombo L = +35·5m.

Aug. 13d. Readings also at 1h. (Zi-ka-wei and near Tacubaya), 2h. (Uccle), 3h. (Eskdalemuir, Rocca di Papa, Vienna, and near Athens (2)), 8h. (near Athens), 11h. (Tiflis), 17h. (near Athens), 19h. (near Port au Prince), 22h. (La Paz).

Aug. 14d. 11h. 41m. 8s. Epicentre 52°·0N. 131°·5E.

$A = -\cdot408$, $B = +\cdot461$, $C = +\cdot788$; $D = +\cdot749$, $E = +\cdot663$; $G = -\cdot522$, $H = +\cdot590$, $K = -\cdot616$.

A depth of focus 0·010 is assumed; but see note at end.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		−0·1	9·0	122	2 25	+10	(4 3)	+ 2	4·0	4·1
Mizusawa	E.	−0·2	14·5	149	3 27	− 3	6 10	− 5	—	—
	N.	−0·2	14·5	149	3 26	− 4	6 8	− 7	—	—
Nagoya		−0·3	17·3	165	4 6	+ 1	—	—	—	—
Tokyo		−0·3	17·4	157	4 4	− 2	(e 7 8)	−12	e 7·1	8·4
Zi-ka-wei		−0·4	22·1	204	e 5 47	+46	e 10 19	+80	—	—
Taihoku		−0·6	28·0	199	—	—	—	—	e 20·2	—
Manila		−0·8	38·4	196	e 7 45	+10	(13 54)	+22	13·9	—
Upsala		−1·1	56·2	326	9 38	− 2	i 17 21	− 1	—	—
Tiflis		−1·1	56·6	297	e 9 58	+15	e 18 52	+84	—	27·2
Konigsberg		−1·2	58·8	321	i 10 0	+ 4	18 5	+11	—	25·9
Honolulu		−1·2	61·4	92	—	—	e 14 32	?PR_1	—	—
Batavia		−1·2	61·9	209	i 10 30	+13	i 19 3	+31	—	—
Hamburg		−1·2	63·7	325	i 10 26	− 3	—	—	53·9	—
Vienna		−1·2	65·6	320	i 10 44	+ 3	19 28	+10	—	37·9
Eskdalemuir		−1·2	66·3	335	i 10 28	−18	e 18 58	−28	—	—
De Bilt		−1·2	67·0	328	10 42	− 8	19 21	−14	—	—
Zagreb		−1·3	67·6	318	10 56	+ 2	19 53	+12	36·9	—
Uccle		−1·3	67·9	328	e 10 46	− 9	e 19 30	−15	--	—
Innsbruck		−1·3	68·3	323	i 10 54	− 4	—	—	—	—
Strasbourg		−1·3	68·6	325	i 10 52	− 8	e 19 52	− 2	e 28·9	—
Padova		−1·3	69·7	320	11 7	0	20 1	− 6	—	—
Pompeii		−1·3	72·3	316	e 10 44	−39	20 52	+14	—	—
Rocca di Papa		−1·3	72·4	317	i 11 19	− 5	i 20 37	− 2	e 61·1	—
Tortosa		−1·3	77·9	325	11 43	−16	21 26	−18	—	—
La Paz		—	141·2	31	18 24	[−77]	—	—	—	—

Additional readings and notes: Taihoku reading has been increased by 1h. Tiflis gives also e = +21m.16s. Konigsberg iZ = +11m.47s. Vienna PS = +20m.6s., e = +22m.35s. Eskdalemuir i = +13m.12s., eE = +22m.8s. De Bilt ePR_1 = +13m.21s., eE = +19m.54s. and +22m.37s. Uccle eSR_1 = +22m.46s. Padova PR_1 = +12m.0s., SR_1 = +20m.21s.; all readings are diminished by 2h. The solution cannot be regarded as satisfactory, but it is difficult to suggest an alternative. The La Paz observation suggests a very deep focus, which is not supported by other observations. Possibly it is not [P] at all, but P: the residual according to adopted tables would then be +69s., but an error of 1 minute is also possible. The assumed focal depth of ·010 is supported chiefly by the observations in azimuths near 320°, those near azimuths 200° being rather the worse for the hypothesis. If we omit the correction for focal depth, all the stations, except the Japanese, suggest moving the epicentre further north, say to 54°·0N. 130°·5E., but this would throw out the Japanese observations.

Aug. 14d. Readings also at 3h. and 5h. (near Athens), 6h. (Colombo), 10h. (near Athens), 13h. (Taihoku), 15h. (near Mizusawa), 17h. (near Athens (2)), 20h. (Bergen), 21h. (Eskdalemuir, De Bilt, Strasbourg, Uccle, and near Tokyo), 23h. (Taihoku (2) and Athens).

Aug. 15d. 14h. 53m. 12s. Epicentre 37°·5N. 23°·0E. (as on Aug. 8d.).

$A = +\cdot730$, $B = +\cdot310$, $C = +\cdot609$; $D = +\cdot391$, $E = -\cdot921$; $G = +\cdot560$, $H = +\cdot238$, $K = -\cdot793$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	0·7	51	i 0 26	+17	—	—	i 0·6	3·6
Pompeii	7·3	299	i 1 59	+ 8	3 34	+16	4·8	—
Belgrade	7·5	347	e 1 57	+ 3	i 4 9	?L	(i 4·2)	6·1
Rocca di Papa	9·0	302	i 2 20	+ 4	(e 3 48)	−15	—	4·4
Zagreb	9·8	330	2 27	0	—	—	—	5·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Florence		10·9	309	4 40	?S	(4 40)	−12	—	4·8
Padova		11·5	317	2 48	− 4	(7 57)	?L	8·0	9·6
Vienna		11·5	338	2 52	0	—	—	e 7·0	8·8
Innsbruck		13·0	323	i 3 12	− 1	—	—	—	—
Zurich		14·5	318	e 3 30	− 3	e 6 19	− 1	—	—
Strasbourg		15·6	320	e 3 46	− 1	e 7 59	?L	8·8	—
Algiers		15·9	273	e 3 53	+ 2	6 48	− 5	—	—
Hamburg		18·5	335	e 4 17	− 6	—	—	—	12·8
Uccle		18·8	321	e 4 22	− 5	e 8 1	+ 3	—	—
De Bilt		19·2	325	e 4 31	0	e 8 6	0	—	—
Upsala		22·6	354	e 4 59	−13	i 9 9	− 8	—	—
Eskdalemuir	E.	25·1	324	—	—	e 9 48	−17	—	—

Padova gives also $PR_1 = +2$m.54s.

Aug. 15d. Readings also at 2h. (near Calcutta), 3h. (near Athens), 4h. (Colombo), 6h. (Taihoku), 12h. (near Nagasaki), 23h. (Lick).

Aug. 16d. 9h. 41m. 30s. Epicentre 37°·5N. 23°·0E. (as on Aug. 15d.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	N.	0·7	51	e 0 13	+ 2	—	—	i 0·9	1·5
Pompeii		7·3	299	e 2 27	+36	—	—	—	—
Belgrade		7·5	347	e 1 53	− 1	e 1 59	−85	—	2·7
Rocca di Papa		9·0	302	—	—	i 3 48	−15	—	3·9
Zagreb		9·8	330	e 2 30	+ 3	—	—	—	5·5
Hamburg		18·5	335	—	—	—	—	e 9·5	—
De Bilt		19·2	325	—	—	e 7 3	−63	—	—

Additional readings and notes: Athens gives also e = +34s., ME = +1·0m. Belgrade ePN (alternative) = +33s. All these readings are reduced by 10m. Zante (Δ = 3°·3) gives a reading at 9h.35m.

1922. Aug. 16d. 15h. 56m. 25s. Epicentre 52°·5N. 157°·5E.

(as on 1922 Mar. 6d.).

A = −·562, B = +·233, C = +·793; D = +·383, E = +·924;
G = −·733, H = +·304, K = −·609.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		11·2	244	3 29	+42	—	—	5·9	8·4
Mizusawa	E.	17·5	227	4 25	+14	—	—	—	—
Tokyo		21·0	224	5 6	+13	(e 9 5)	+21	e 9·1	9·5
Nagoya		22·6	228	4 42	−30	—	—	—	—
Osaka		23·7	230	5 16	− 9	(9 48)	+10	9·8	10·1
Kobe		23·9	230	(5 8)	−19	5 8	?P	7·9	9·9
Nagasaki		28·0	236	6 9	+ 1	10 50	− 9	13·7	—
Zi-ka-wei		33·7	245	e 6 56	− 6	e 12 28	− 8	—	21·8
Taihoku		38·5	239	—	—	e 12 54	−51	—	—
Hong Kong		44·6	244	8 26	− 4	—	—	22·7	27·6
Honolulu	E.	46·1	116	—	—	14 53	−36	21·7	20·9
Manila		47·7	232	e 8 52	0	(16 0)	+10	16·0	—
Victoria		48·0	61	9 22	+28	(15 1)	−53	i 15·1	23·4
Berkeley	E.	55·3	71	9 35	− 6	17 5	−20	e 26·0	—
Calcutta	E.	59·7	270	13 44	?PR_1	23 44	?SR_1	33·9	39·8
Simla	E.	60·1	283	18 35	?S	(18 35)	+11	36·7	37·4
	N.	60·1	283	18 29	?S	(18 29)	+ 5	37·9	38·4
Upsala		63·1	339	i 10 34	+ 1	i 19 3	+ 1	e 32·7	40·7
Konigsberg		66·9	335	i 10 56	− 1	19 48	− 1	e 34·6	47·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis		69·3	314	e 11 35	+22	e 20 41	+23	e 30·2	47·7
Chicago		70·2	46	11 2	−16	20 5	−23	34·6	—
Lemberg		70·3	330	e 11 23	+ 4	e 20 41	+11	e 39·0	46·2
Edinburgh		70·4	350	—	—	i 20 38	+ 7	29·6	52·1
Hamburg		70·5	341	i 11 22	+ 2	e 20 25	− 7	e 34·6	38·6
Eskdalemuir		71·0	350	i 11 21	− 2	20 33	− 5	34·6	44·5
Ann Arbor		71·5	43	11 5	−22	20 23	−21	40·5	—
Bombay		71·9	278	16 56	?PR_1	—	—	—	—
Ottawa		72·0	37	11 16	−14	20 29	−21	32·6	—
Toronto		72·1	40	e 11 23	− 8	e 19 47	−64	e 36·6	41·2
Stonyhurst		72·3	348	—	—	—	—	—	48·9
Batavia		72·6	233	i 11 36	+ 2	i 21 6	+ 9	e 38·7	—
De Bilt	E.	72·8	343	11 35	0	20 58	− 2	e 36·6	42·3
	N.	72·8	343	—	—	—	—	e 35·6	50·0
Vienna	E.	73·9	334	i 11 42	+ 1	i 20 57	−16	e 35·1	—
		73·9	334	e 11 41	0	i 21 12	− 1	—	42·9
Oxford		74·2	348	i 11 49?	+ 6	i 21 20	+ 4	32·6	54·0
Uccle		74·2	344	11 40	− 3	21 12	− 4	e 36·6	42·8
Ithaca		74·3	39	—	—	—	—	36·6	—
Strasbourg		75·7	340	i 8 35	?	i 18 5	?	36·6	44·6
Kodaikanal		75·8	270	21 47	?S	(21 47)	+12	47·4	50·0
Belgrade		75·9	330	i 11 52	− 2	i 21 31	− 5	41·6	49·8
Innsbruck		76·1	337	i 11 54	− 2	i 21 31	− 7	e 37·6	52·4
Zagreb		76·3	333	i 11 54	− 3	21 36	− 5	e 35·6	41·6
Paris		76·5	344	e 11 53	− 5	e 21 35	− 8	e 34·6	43·6
Zurich		76·6	339	11 55	− 4	21 38	− 6	—	—
Colombo		76·9	266	12 35	+35	22 53	+65	50·6	54·6
Georgetown		77·0	40	i 11 48	−13	e 21 48	− 1	39·0	—
Besançon		77·4	340	—	—	—	—	e 40·6	—
Padova		77·7	336	12 2	− 3	21 51	− 6	39·6	53·6
Florence		79·4	337	8 35	?	22 25	+ 9	29·1	48·6
Rocca di Papa		80·9	334	i 12 23	− 1	i 22 29	− 5	e 29·3	56·6
Pompeii		81·4	332	13 31	+64	34 33	?	44·6	—
Barcelona		83·6	342	e 12 35	− 5	23 0	− 5	—	53·4
Tortosa	N.	84·5	344	12 35	−10	23 2	−12	38·0	52·8
Helwan		85·2	316	i 12 41	− 8	23 15	− 6	53·6	58·1
Riverview		86·5	185	e 12 55	− 1	e 23 4	−32	e 37·3	—
Coimbra	E.	86·5	350	12 48	− 8	23 26	−10	41·6	51·5
	N.	86·5	350	—	—	23 22	−14	—	57·6
Algiers		88·0	339	12 54	−11	23 49	− 3	44·1	60·1
Rio Tinto		88·6	349	48 35	?L	—	—	(48·6)	63·6
Granada		88·8	347	i 13 0	− 9	i 23 47	−14	44·6	48·2
San Fernando		89·8	348	—	—	23 41	−31	—	57·6
Melbourne		91·0	190	—	—	i 24 5	−19	—	61·1
La Paz		129·3	60	19 17	[0]	33 47	?	74·6	80·0
Cape Town		145·5	286	78 38	?L	—	—	(78·6)	—

Additional readings: Ootomari readings are increased by 2h., also MN = +7·4m. Mizusawa gives also SN = +4m.26s. Tokyo eS = +6m.53s., MN = +9·7m. Osaka MN = +10·0m. Kobe P = +3m.35s. Zi-ka-wei MN = +18·7m. Honolulu PR_1 = +9m.56s., SR_1E = +18m.28s., SR_1N = +18m.18s., L = +20·9m., MN = +21·0m., T_0 = 15h.55m.58s. Upsala PR_1 = +14m.44s., PS = +19m.43s., MN = +68·2m. Konigsberg eLN = +32·6m., MZ = +48·6m. Tiflis e = +15m.53s., [e] = +21m.23s., eL = +26·4m., MN = +47·8m. Hamburg PS = +21m.23s., SR_1 = +25m.41s., MZ = +46·3m., MN = +46·4m. Eskdalemuir SR_1 = +26m.5s. MN = +62·8m., T_0 = 15h.56m.33s. Origin 52°N. 147°E. Ann Arbor PE = +12m.23s. Toronto eL = +46·9m. and +58·7m. Batavia iN = +22m.47s. and +24m.7s. Vienna iN = +18m.40s. and +24m.34s., iE = +41m.51s. Uccle MN = +47·8m. Ithaca L = +52·6m. Zagreb MNW = +43·6m. Paris MN = +51·6m. Colombo S = +44m.35s.? Georgetown LN = +45·2m. Padova PR_1 = +12m.30s., SR_1 = +24m.5s. Florence reading has been increased by 1h. Coimbra iE = +23m.38s. Granada MN = +58·9m. San Fernando MN = +62·6m.

Aug. 16d. Readings also at 1h. (Apia), 5h. (near La Paz), 6h. (Manila, Riverview, and Melbourne), 7h. (Victoria, Toronto, De Bilt, Uccle, and near Tacubaya), 10h. (Manila), 12h. (Stonyhurst, Apia, and near Zante and Athens), 13h. (Stonyhurst (2), Wellington, and Christchurch), 14h. (Sapporo), 15h. (Colombo and Kodaikanal), 18h. (Uccle), 20h. and 22h. (near Athens).

Aug. 17d. 15h. 3m. 36s. Epicentre 36°·0N. 28°·0E. (as on Aug. 13d.).
A = +·714, B = +·380, C = +·588 ; D = +·470, E = −·883 ; G = +·519, H = +·276, K = −·809.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·9	302	e 1 5	+ 4	e 1 37	−10	e 2·1	e 2·8
Belgrade	10·5	329	e 2 50	+13	e 4 44	+ 1	e 5·8	—
Rocca di Papa	13·2	301	—	—	—	—	e 6·5	9·4
Tiflis	14·2	61	e 3 54	+25	—	—	e 9·4	—
Vienna	15·0	329	e 3 37	− 2	—	—	—	12·7
Hamburg	21·6	330	—	—	e 8 4	−53	—	16·7
De Bilt	22·8	322	—	—	—	—	e 12·4	15·4

Additional readings : Athens gives its P and S as e's, also eL = +1·2m. Tiflis e = +6m.48s. Hamburg MN = +14·5m. De Bilt MN = +13·2m.

Aug. 17d. Readings also at 0h. (Dehra Dun, Colombo, Simla, Hamburg, and De Bilt), 3h. (Algiers), 4h. (near La Paz), 6h. and 10h. (Zagreb), 13h. (La Paz), 14h. (Strasbourg), 18h. (Tiflis), 20h. (La Paz).

Aug. 18d. 5h. 12m. 15s. Epicentre 36°·5N. 122°·0W. (as on 1922 Mar. 16d.).
A = −·426, B = −·682, C = +·595 ; D = −·848, E = +·530 ; G = −·315, H = −·504, K = −·804.

An epicentre further south would suit Lick and Berkeley better, but there is not evidence enough to justify departure from the origin previously adopted.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Lick		0·9	18	i 0 9	− 5	i 0 27	+ 2	—	0·8
Berkeley		1·4	352	e 0 19	− 2	i 0 46	+ 7	—	1·4
Tucson	E.	10·1	111	—	—	e 4 26	− 6	—	5·7
	N.	10·1	111	—	—	e 4 15	−17	—	5·2
Victoria		11·9	355	—	—	—	—	4·8	7·7
Chicago		27·0	68	—	—	—	—	e 23·0	—
Toronto		32·6	65	—	—	—	—	22·2	—
Honolulu	N.	34·8	256	—	—	—	—	e 15·4	—
Ithaca		35·2	66	—	—	—	—	17·8	—
Georgetown	E.	35·3	72	—	—	—	—	17·2	—
Washington		35·3	72	—	—	—	—	e 19·0	—
Ottawa		35·5	61	—	—	—	—	e 17·8	—
Northfield		37·8	63	—	—	—	—	e 16·8	—
Eskdalemuir		74·4	32	—	—	—	—	40·8	—
Stonyhurst		75·7	33	e 33 45	?L	—	—	(e 33·8)	42·4
De Bilt		80·2	30	—	—	—	—	e 44·8	45·6

Additional readings and notes : Lick gives also iPEN = +12s., iPN = +19s., iPZ = +20s., iPEZ = +21s., iSE$_2$ = +37s., iSZ$_2$ = +39s., MN = +0·9m., MZ = +1·3m. Berkeley iPENZ = +29s., iZ = +37s., iN = +40s., iEN = +54s., iSEN = +56s., MZ = +1·3m., MN = +1·6m. Toronto reading has been increased by 30m. Stonyhurst reading has been diminished by 1hr.

Aug. 18d. 19h. 50m. 26s. Epicentre 13°·0N. 85°·4W. (as on 1922 Feb. 16d.).
A = +·078, B = −·971, C = +·225 ; D = −·997, E = −·080 : G = +·018, H = −·224, K = −·974.

The serious objection to this solution is that stations near the adopted epicentre (such as La Paz, Tacubaya, &c.) and even N. American stations give no record of the shock. But it is difficult to suggest any very different epicentre from the evidence of European stations.

		Δ	Az.	P.	O−C.	L.	M.
		°	°	m. s.	s.	m.	m.
Coimbra		71·8	51	—	—	e 57·6	—
Eskdalemuir		74·9	37	—	—	38·6	—
Uccle		79·8	41	e 12 58	+40	e 41·6	—
De Bilt		80·1	40	—	—	e 42·6	50·6
Hamburg		82·7	37	e 12 34	0	e 44·6	—
Rocca di Papa		87·3	48	e 12 58	− 3	e 42·8	57·0
Vienna		88·0	40	12 56	− 9	—	52·6
Zagreb	N.E.	88·4	43	e 13 7	0	e 44·6	53·6
	N.W.	88·4	43	e 13 9	+ 2	—	49·6
Tiflis		108·7	37	—	—	e 43·6	49·8

Additional readihgs : De Bilt gives also MN = +51·6m. Rocca di Papa e = +6m.46s.

Aug. 18d. Readings also at 0h. (Riverview), 7h. (Zagreb and Manila), 14h. and 15h. (La Paz), 17h. (Coimbra), 18h. (De Bilt), 20h. (Colombo, Perth, and Honolulu), 21h. (Florence, Uccle, De Bilt, and Victoria), 23h. (Batavia).

Aug. 19d. 23h. 18m. 8s. Epicentre 37°·5N. 23°·0E. (as on 16d.),

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	0·7	51	i 0 11	0	i 0 20	0	i 0·4	0·6
Belgrade	7·5	347	e 3 29	?S	(e 3 29)	+ 5	i 5·6	—
Rocca di Papa	9·0	58	3 58	?S	(3 58)	− 5	—	5·5
Zagreb	9·8	330	—	—	e 3 52	−31	—	5·9
De Bilt	19·2	325	—	—	—	—	e 10·9	—

Additional readings: Athens gives also MN = +0·7m. Belgrade iS = +4m.35s.

Aug. 19d. Readings also at 2h. (near Nagasaki), 3h. (La Paz), 5h. (near Osaka and Kobe), 7h. (Tiflis), 8h. (Paris), 20h. (Strasbourg and Riverview), 21h. (Zante and near Mizusawa), 23h. (Rocca di Papa).

Aug. 20d. 3h. 14m. 35s. Epicentre 22°·0N. 125°·5E. (as on 1913 Jan. 7d.).

A = −·538, B = +·755, C = +·375; D = +·814, E = +·581; G = −·218, H = +·305, K = −·927.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	4·7	310	1 18	+ 5	—	—	1·8	1·9
Manila	8·6	211	e 3 43	?S	(e 3 43)	−10	—	—
Zi-ka-wei	9·3	338	e 3 15	+55	e 4 10	0	—	—
Tokyo	18·5	39	e 4 27	+ 4	—	—	—	—
De Bilt	89·5	328	—	—	—	—	e 45·4	—

No additional readings.

Aug. 20d. 5h. 0m. 36s. Epicentre 44°·5N. 11°·5E. (as on 1922 May 25d.).

A = +·699, B = +·142, C = +·701.

Very doubtful.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Padova	0·9	−0 1	−15	0 24	− 1	1·2	1·9
Rocca di Papa	2·8	e 0 48	+ 4	—	—	—	1·4
Zagreb	3·4	e 0 48	− 5	—	—	—	2·1
Zurich	3·5	(1 1)	+ 6	1 1	?P	—	—
Besançon	4·7	1 24	+11	—	—	—	—
Strasbourg	4·8	e 1 29	+15	e 2 4	− 7	—	—
Vienna	5·0	e 1 19	+ 2	—	—	—	3·6

Additional readings: Padova gives also SR_1 = +34s. Rocca di Papa eN = +24s. Zurich eP = +22s.

Aug. 20d. Readings also at 2h. (Azores and near Tokyo), 7h. (Azores and Taihoku), 13h. (Colombo, Nagoya, and near Osaka and Kobe), 14h. (near Manila), 15h. (Azores,) 16h. (Taihoku, Athens, and Stonyhurst), 20h. (Athens, Florence, Simla, Taihoku, and Stonyhurst).

Aug. 21d. 19h. 22m. 10s. Epicentre 12°·0S. 69°·0W. (as on 1920 Oct. 7d.).

A = +·351, B = −·913, C = −·208 ; D = −·934, E = −·358 ; G = −·075, H = +·194, K = −·978.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz	4·6	169	i 1 13	+ 2	1 58	− 8	2·1	2·4
La Quiaca	10·6	163	3 50	+72	—	—	5·0	6·2
Andalgala N.	15·8	171	3 50	+ 1	—	—	4·3	5·1
Pilar E.	20·2	167	9 44	?S	(9 44)	+77	10·2	11·3
Mendoza	20·9	178	9 8	?S	(9 8)	+26	11·0	13·0
Cipolletti	27·0	178	—	—	(10 2)	−39	10·0	12·8
Eskdalemuir	86·7	31	—	—	—	—	42·8	—
Uccle	89·1	39	—	—	—	— e	47·8	—
De Bilt E.	90·0	38	—	—	—	— e	48·8	—
Hamburg	93·3	36	—	—	—	— e	66·8	—
Zagreb	95·1	45	—	—	—	— e	57·8	—
Colombo	148·8	98	85 50	?L	—	—	(85·8)	—

Additional readings: La Quiaca gives also MN = +5·7m. Pilar LN = +10·1m., MN = +10·7m. Cipolletti readings have been increased by 10m. De Bilt eLN = +49·8m.

Aug. 21d. Readings at 0h. (Azores), 2h. (Rocca di Papa), 6h. (Azores), 7h. (near Vera Cruz), 13h. (Tiflis), 17h., 19h., and 20h. (Azores), 22h. (near Mizusawa), 23h. (Azores).

Aug. 22d. Readings at 1h. (Port au Prince), 3h. (near Athens), 7h. (Taihoku and near Tokyo), 11h. (Azores), 14h. (Batavia), 15h. (Zi-ka-wei), 16h. (Strasbourg and Taihoku), 17h. (near Athens), 20h. (2) and 21h. (Batavia).

Aug. 23d. Readings at 0h. (Batavia), 4h. (Vienna, De Bilt, Konigsberg, Hamburg, Simla, Zagreb, and Edinburgh), 6h. (De Bilt), 11h. (near Tacubaya), 14h. (Colombo, Batavia, Kodaikanal, and near Tacubaya), 15h. (Manila, Hong Kong, Colombo, Simla, Kodaikanal, and Batavia), 20h. (Batavia and Azores).

Aug. 24d. 17h. 12m. 30s. Epicentre 44°·5N. 11°·5E. (as on 20d.).

	Δ	P.	O−C.	S.	O−C.	M.
	°	m. s.	s.	m. s.	s.	m.
Florence	0·7	0 15	+ 4	—	—	0·5
Padova	0·9	0 32	+18	0 45	+20	1·3
Zagreb	3·4	—	—	e 1 30	− 4	—
Zurich	3·5	e 0 51	− 4	i 1 30	− 7	—

No additional readings.

Aug. 24d. 19h. 45m. 18s. Epicentre 35°·5N. 141°·0E. (as on 1922 April 10d.).

A = −·633, B = +·512, C = +·581.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	1·1	i 0 17	0	i 0 24	− 7	—	0·4
Mizusawa E.	3·6	0 56	0	1 35	− 4	—	—
Kobe	4·9	e 1 22	+ 6	(2 20)	+ 6	2·3	2·5
Batavia	52·6	—	—	(e 15 7)	−104	e 15·1	18·1

Additional readings: Tokyo gives also MN = +2·2m., all readings being given as at 20h. Mizusawa SN = 1m.33s.

Aug. 24d. Readings also at 0h. (Strasbourg), 7h. (Mizusawa), 14h. (La Paz), 16h. (Strasbourg), 19h. (near Batavia).

Aug. 25d. 11h. 43m. 20s. Epicentre 13°·5S. 162°·0E. (as on 1920 Nov. 6d.).

A = −·925, B = +·300, C = −·233 ; D = +·309, E = +·951 ;
G = +·222, H = −·072, K = −·972.

Very rough.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sydney		22·6	204	9 25	?S	(9 25)	+ 8	10·3	15·0
Riverview		22·6	204	e 5 40	+28	e 10 1	+44	e 11·5	—
Melbourne		28·7	209	6 40	+25	11 58	+46	14·7	17·7
Adelaide		29·8	220	—	—	—	—	e 13·7	17·5
Manila		49·4	304	e 8 58	− 5	—	—	19·3	—
Honolulu	E.	52·4	49	9 20	− 2	16 40	− 9	23·2	27·0
	N.	52·4	49	—	—	—	—	24·3	27·1
Hong Kong		59·0	307	12 44	?PR$_1$	—	—	28·7	31·7
Kodaikanal		87·2	281	59 4	?L	—	—	(59·1)	—
Berkeley	E.	87·3	50	—	—	—	—	e 68·9	—
Victoria		90·2	40	—	—	—	—	29·2	45·7
Chicago		114·1	50	—	—	—	—	e 50·7	—
Toronto		119·8	47	—	—	—	—	70·0	—
Ottawa		122·0	44	—	—	e 59 10	?L	e 64·7	—
Hamburg		134·2	337	—	—	e 38 40	?	e 66·7	—
Eskdalemuir		136·6	347	—	—	—	—	66·7	79·7
Zagreb		136·8	325	e 23 40	?PR$_1$	—	—	e 65·7	69·7
De Bilt	E.	137·2	339	—	—	—	—	e 59·7	74·6
	N.	137·2	339	—	—	—	—	e 64·7	77·5
Uccle		138·5	339	—	—	—	—	e 58·7	—

Additional readings and notes: Sydney P has been increased by 10m. Honolulu gives also SR,N = +21m.2s., LN = +26·7m., T$_o$ = 11h.43m.27s. Eskdalemuir MN = +84·7m. Zagreb MNW = +78·7m.

Aug. 25d. 11h. 47m. 24s. Epicentre 36°·5N. 1°·5E.

A = +·804, B = +·021, C = +·595 ; D = +·026, E = −1·000 ;
G = +·595, H = +·016, K = −·804.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Algiers		1·3	76	i 0 25	+ 5	0 45	+ ·9	1·0	1·2
Granada		4·1	280	1 2	− 2	i 1 46	− 7	i 1·9	2·9
Tortosa		4·4	351	1 5	− 3	1 58	− 3	2·2	5·7
Barcelona		5·0	6	e 1 12	− 5	2 7	−10	e 2·4	3·1
San Fernando		6·2	272	2 32	+57	3 12	?L	(3·2)	5·1
Coimbra	E.	8·6	299	e 3 28	?S	(e 3 28)	−25	e 4·9	5·5
	N.	8·6	299	e 3 29	?S	(e 3 29)	−24	5·2	6·6
Puy de Dôme		9·3	6	3 36?	?S	(3 36?)	−34	—	—
Moncalieri		9·7	28	e 3 9	+43	4 58	?L	6·6	9·3
Rocca di Papa		10·1	55	e 2 54	+23	—	—	e 5·1	9·3
Besançon		11·2	16	—	—	—	—	5·6	—
Zurich		12·1	24	e 2 57	− 3	—	—	e 7·3	—
Paris		12·4	3	—	—	5 36	+ 7	—	—
Strasbourg		12·9	19	3 8	− 4	e 6 4	+22	7·1	9·6
Innsbruck		13·1	31	i 3 11	− 3	e 5 24	−22	—	—
Zagreb		14·3	45	3 31	+ 1	—	—	e 9·6	12·6
Uccle		14·5	8	e 2 31	−62	—	—	e 7·1	8·6
Kew		15·0	356	—	—	—	—	—	8·6
Oxford		15·4	354	—	—	6 36	− 5	—	9·3
De Bilt	E.	15·8	8	—	—	—	—	8·0	11·2
	N.	15·8	8	—	—	—	—	9·1	11·8
Vienna		16·0	38	i 3 49	− 3	—	—	i 10·7	—
Hamburg		18·1	17	e 4 14	− 4	—	—	e 10·0	11·4
Eskdalemuir		19·1	352	i 4 27	− 3	e 8 5	+ 1	8·1	10·8
Edinburgh		19·6	352	—	—	—	—	10·6	12·1
Konigsberg		22·5	30	−i 0 8	?	2 15	?	e 13·3	15·9

Additional readings: Granada gives also PR$_1$ = +1m.12s., MN = +2·8m. Barcelona MN = +6·4m. San Fernando MN = +4·9m. Coimbra SE = +4m.19s., iSN = +4m.29s., T$_o$E = 11h.49m.50s., T$_o$N = 11h.49m.37s. Hamburg MN = +15·6m.

1922. Aug. 25d. 19h. 29m. 30s. Epicentre 50°·0N. 91°·8E.

A = −·020, B = +·643, C = +·766 : D = +1·000, E = +·031 ; G = −·024, H = +·766, K = −·643.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Simla	E.	21·8	216	5 6	+ 3	8 54	+ 7	—	—
	N.	21·8	216	5 24	+21	9 0	− 1	e 14·3	—
Dehra Dun		22·2	213	5 30	+23	—	—	—	—
Calcutta	E.	27·6	187	6 15	+10	11 32	+40	16·6	—
	N.	27·6	187	6 17	+12	11 22	+30	17·7	—
Zi-ka-wei		29·0	119	e 6 19	+ 1	—	—	—	20·6
Hong Kong		32·8	140	12 15	?S	(12 15)	− 6	17·7	18·5
Nagasaki		32·9	107	e 10 22	?S	(e 10 22)	−120	18·6	21·1
Tiflis		33·2	273	e 6 54	− 4	e 12 6	−21	e 18·0	22·0
Ootomari		33·4	77	16 15	?L	—	—	18·7	19·7
Taihoku		33·9	127	—	—	—	—	e 15·7	—
Bombay		34·6	213	4 26	?	—	—	—	—
Kobe		34·9	99	—	—	—	—	e 22·1	23·5
Osaka		35·1	99	16 3	?L	—	—	(16·0)	22·9
Tokyo		37·2	94	—	—	—	—	e 19·1	22·4
Upsala		41·4	315	7 49	−17	14 5	−22	e 22·3	25·6
Kodaikanal		41·5	203	19 6	?L	—	—	24·0	25·3
Konigsberg		41·8	306	7 59	−10	13 57	−35	e 21·1	25·5
Lemberg		42·1	296	e 8 6	− 6	—	—	e 19·6	25·5
Manila		42·6	137	e 8 47	+32	—	—	24·5	26·5
Colombo		44·2	198	15 6	?S	(15 6)	+ 1	26·5	28·8
Bergen		46·6	319	e 21 30	?L	—	—	29·5	—
Belgrade		46·7	291	e 8 37	− 8	e 21 55	?	e 26·4	—
Vienna		47·2	299	i 8 44	− 4	(i 15 45)	+ 1	e 25·0	29·0
Hamburg		47·9	309	e 8 48	− 5	—	—	e 23·3	26·7
Zagreb		48·8	295	8 55	− 4	15 58	− 6	e 24·5	30·5
Innsbruck		50·6	300	e 8 53	−18	—	—	e 27·7	31·7
De Bilt	E.	51·2	309	9 19	+ 5	16 30	− 4	25·6	32·8
	N.	51·2	309	—	—	—	—	24·7	29·1
Padova		51·3	299	9 25	+10	18 53	?SR_1	(28·0)	31·4
Dyce	N.	51·7	318	—	—	—	—	—	28·5
Strasbourg		51·8	303	e 9 22	+ 3	—	—	e 27·5	32·0
Zurich		52·1	301	e 9 18	− 3	—	—	—	—
Uccle		52·3	308	e 9 20	− 2	e 16 48	0	24·5	33·4
Edinburgh		52·9	315	16 54	?S	(16 54)	− 1	27·0	36·1
Rocca di Papa		53·1	293	e 9 27	0	(e 16 54)	− 3	i 28·7	33·9
Eskdalemuir		53·3	315	i 9 33	+ 5	17 4	+ 4	24·5	29·4
Besançon		53·6	303	9 39?	+ 9	—	—	27·5	—
Stonyhurst		53·8	314	e 16 54	?S	(e 16 54)	−12	30·5	32·5
Moncalieri		54·0	300	i 7 42	−111	19 26	+137	27·4	33·8
Kew		54·2	310	21 30	?SR_1	—	—	—	31·5
Paris		54·4	308	e 9 41	+ 6	e 17 16	+ 2	28·5	34·5
Oxford		54·6	311	—	—	e 17 16	0	25·5	35·3
Barcelona		59·4	299	—	—	—	—	e 31·5	36·9
Tortosa		60·3	300	10 23	+ 9	—	—	30·8	35·4
Algiers		62·0	295	e 10 31	+ 6	e 18 56	+ 8	33·5	40·0
Granada		65·5	300	i 10 58	+10	e 19 58	+27	33·5	36·2
Coimbra	E.	66·0	305	10 54	+ 3	19 48	+11	30·9	36·3
	N.	66·0	305	11 18	+27	—	—	32·4	42·2
Rio Tinto		66·7	302	37 30	?L	—	—	(37·5)	40·5
San Fernando		67·5	300	—	—	—	—	—	41·7
Victoria		77·1	24	—	—	—	—	34·7	47·5
Ottawa		84·1	351	12 48	+ 5	23 8	− 1	49·5	—
Honolulu	N.	85·9	62	29 5	?SR_1	40 10	?	56·0	47·4
Cape Town		105·9	236	58 30	?L	—	—	(58·5)	—

Additional readings and notes : Zi-ka-wei gives also MN = +21·0m. Tiflis e = +12m.42s., +13m.54s., and +19m.54s., MN = +21·7m. Kobe MN = +22·5m. Osaka MN = +22·8m. Tokyo MN = +26·1m. Upsala MN = +24·3m. Konigsberg MNZ = +22·6m. Manila MN = +25·9m. Colombo S = +28m.18s. and +21m.0s. Bergen e = +25m.30s. Vienna PR_1E = +11m.25s., SN = +17m.26s., PSE? = +18m.28s., the true S is given as iE. Hamburg iPR_1 = +10m.40s., SR_1 = +19m.30s., MZ = +30·0m. Strasbourg iPR_1 = +10m.40s., SR_1 = +19m.30s. Zagreb PNW = +8m.56s., PR_1NE = +10m.47s., PR_1NW = +10m.50s., PR_1NE = +12m.24s., SR_1 = +19·5m., MNW = +28·3m. De Bilt PR_1 = +11m.12s., SR_1 = +20m.18s. Padova L given as P of a second shock. Strasbourg e = +20m.39s., MN = +28·1m. Uccle ePR_1 = +11m.27s., eSR_1 = +20m.30s., MN = +29·4m. Edinburgh S = +21m.6s. Rocca di Papa e = +11m.42s., also S is given as eL. Eskdalemuir SR_1 = +21m.5s., MN = +28·8m. Stonyhurst S = +21m.0s. (?SR_1). Granada PS = +21m.30s. San Fernando MN = +46·5m. Honolulu eSR_1N = +46m.52s., eSR_2N = +52m.0s. T_0 = 19h.45m.26s.

Aug. 25d. Readings also at 1h. (Tiflis), 2h. (Tiflis and Riverview), 3h. (near Merida), 9h. (Taihoku), 15h. (Puebla), 22h. (Toronto).

Aug. 26d. 2h. 19m. 25s. Epicentre 7°·0S. 145°·0E. (as on 1920 Oct. 22d.).

A = −·813, B = +·569, C = −·122 ; D = +·574, E = +·819 ; G = +·100, H = −·070, K = −·993.

Very rough.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview		27·4	169	e 5 56	− 6	i 10 56	+ 8	e 13·9	—
Adelaide		28·5	191	—	—	—	—	—	18·6
Melbourne		30·7	180	—	—	e 11 17	−29	15·9	20·0
Manila		32·2	312	—	—	e 11 47	−24	15·2	—
Honolulu	N.	62·6	62	—	—	—	—	e 25·4	—
De Bilt		124·2	331	—	—	—	—	e 60·6	—
Uccle		125·4	331	—	—	—	—	e 59·6	—
Eskdalemuir		125·5	338	—	—	—	—	58·6	—
La Paz		139·5	126	19 45 [+ 6]	—	—	—	23·7	24·0

De Bilt gives also eE = +42m.35s., e = +51m.35s.

Aug. 26d. 6h. 25m. 16s. Epicentre 9°·0S. 163°·0E.

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Apia		25·2	103	5 43	+ 3	—	—	—	9·2
Riverview		27·2	202	e 6 5	+ 5	10 38	− 7	e 12·6	—
Melbourne		33·1	207	e 6 56	− 1	—	—	16·7	23·4
Wellington		34·0	164	e 6 26	−39	e 11 14	−86	—	11·7
Adelaide		34·3	218	e 12 44	?S	(e 12 44)	0	21·0	22·7
Honolulu	E.	48·8	51	15 59	?S	(15 59)	− 5	22·0	24·7
	N.	48·8	51	16 8	?S	(16 8)	+ 4	—	29·2
Berkeley		83·7	50	—	—	—	—	e 43·3	—
Victoria		86·2	40	—	—	—	—	—	45·4
Kodaikanal		87·4	281	67 50	?	—	—	—	—
Chicago		110·4	48	—	—	e 47 44	?L	56·7	—
Cipolletti		112·5	139	48 26	?L	—	—	(48·4)	51·9
Mendoza		115·7	133	47 14	?L	—	—	(47·2)	54·7
Toronto		116·0	45	—	—	—	—	e 64·4	71·9
Pilar	E.	119·5	135	42 , 8	?L	—	—	(42·1)	63·8
Andalgala	N.	119·9	129	44 32	?L	—	—	(44·5)	47·9
Hamburg		130·4	339	—	—	—	—	e 82·7	—
Eskdalemuir		132·4	349	—	—	—	—	81·7	—
De Bilt	E.	133·2	340	—	—	e 43 8	?	e 86·7	91·4
	N.	133·2	340	—	—	e 33 56	?	e 84·7	96·0
Stonyhurst		133·6	347	e 81 44	?L	—	—	(e 81·7)	96·4
Uccle		134·6	340	—	—	—	—	—	83·7
Kew		135·3	346	90 44	?L	—	—	(90·7)	95·7

Additional readings: Apia gives also MN = +19·9m. Adelaide eS? = +17m.14s. Honolulu eN = +18m.29s., SE = +20m.19s. Berkeley eZ = +17m.26s., eE = +33m.44s. Pilar PN = +56m.14s. Toronto e = +61m.8s., eL = +69·7m.

Aug. 26d. Readings also at 0h. (Puebla), 2h. (Melbourne), 7h. (near Tacubaya), 8h. (Port au Prince, Oaxaca, and Taihoku), 11h. (near Mizusawa), 12h. (Tiflis), 17h. (Tacubaya), 19h. (near Mizusawa).

Aug. 27d. Readings at 4h. (Vera Cruz and near Zurich and Padova), 7h. (near Tacubaya), 9h. (W. Bromwich), 11h. (Mizusawa), 12h. (Zagreb, De Bilt, and near Athens), 15h. and 12h. (Manila).

Aug. 28d. Readings at 6h. (near Tacubaya), 8h. (Hamburg, Coimbra, Uccle, and near Tokyo), 10h. (Batavia), 16h. (La Paz), 18h. (2), 21h., and 22h. (Batavia).

Aug. 29d. 3h. 36m. 0s. Epicentre 38°·0N. 33°·5E.

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	E.	7·7	273	e 2 51	+54	e 3 49	+20	e 3·9	5·0
	N.	7·7	273	—	—	3 41	+12	e 3·8	5·3
Tiflis		9·4	63	e 3 18	+56	e 4 24	+11	e 5·1	8·9
Belgrade	E.	11·9	309	—	—	i 6 13	?L	(i 6·2)	8·1
	N.	11·9	309	e 3 3	+ 5	e 6 10	?L	(e 6·2)	6·4
Lemberg		13·6	333	—	—	e 5 54	− 4	—	8·5
Zagreb		15·1	307	3 43	+ 3	e 6 42	+ 8	e 8·0	8·8
Vienna		16·1	315	i 3 57	+ 4	i 7 2	+ 5	e 8·5	10·1
Rocca di Papa		16·3	290	e 3 54	− 2	7 0	− 2	—	11·2
Padova		17·7	302	4 14	+ 1	(7 49)	+16	(9·4)	11·8
Konigsberg		19·0	336	i 4 35	+ 6	7 58	− 4	—	12·3
Moncalieri		20·4	298	i 5 7	+21	8 44	+12	13·1	—
Zurich		20·5	305	e 4 46	− 1	e 8 22	−12	—	—
Strasbourg		21·4	308	e 5 0	+ 2	e 12 6	?L	e 16·0	—
Hamburg		22·4	322	e 5 8	− 2	(e 9 18)	+ 5	e 9·3	13·9
De Bilt		24·2	315	—	—	e 9 42	− 6	—	15·9
Uccle		24·2	312	e 5 27	− 3	e 9 38	−10	—	—
Paris		24·7	306	—	—	9 0	−57	—	13·0
Kew		27·2	311	—	—	—	—	—	11·0
Oxford		27·9	311	i 6 1	− 6	e 11 45	+48	—	—
Eskdalemuir		30·0	317	e 6 23	− 5	e 11 15	−19	—	20·0

Additional readings : Tiflis gives also e = +6m.30s., MN = +7·4m. Zagreb MNW = +9·2m. Rocca di Papa ePN = +4m.0s. Padova MN = +11·5m. L and S are given as S and PR_1 respectively.

Aug. 29d. 17h. 0m. 48s. Epicentre 12°·0N. 123°·1E. (as on 1915 Mar. 12d.).

A = −·534, B = +·819, C = +·208 ; D = +·838, E = +·546 ;
G = −·114, H = +·174, K = −·978.

		Δ	Az.	P.	O−C.	S	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		3·3	322	i 1 0	+ 8	(i 1 34)	+ 3	i 1·6	—
Taihoku		13·1	354	e 3 19	+ 5	—	—	6·9	—
Hong Kong		13·4	322	3 16	− 2	(5 39)	−14	5·6	9·2
Zi-ka-wei		19·2	356	e 4 41	+10	e 8 19	+13	—	15·4
Nagasaki		21·5	16	5 10	+11	(9 18)	+23	9·3	—
Batavia		24·4	222	5 30	− 2	9 52	0	e 17·2	—
Kobe		25·2	24	5 50	+10	8 50	−77	10·8	15·2
Osaka		25·3	24	6 23	+42	(10 47)	+38	10·8	12·1
Tokyo		28·0	30	e 7 18	+70	—	—	e 12·0	13·9
Calcutta	E.	34·7	291	6 50	−21	—	—	18·3	21·8
Colombo		43·0	267	11 0	?	14 48	0	19·0	28·2
Kodaikanal		44·8	276	15 42	?S	(15 42)	+30	23·0	28·7
Simla	N.	46·4	302	15 30	?S	(15 30)	− 3	28·2	—
Bombay		48·4	283	15 48	?S	(15 48)	−11	—	—
Adelaide		49·2	164	—	—	15 48	−21	23·6	28·0
Sydney		53·0	151	13 54	?	—	—	27·2	30·2
Riverview		53·0	151	—	—	e 17 13	+17	e 24·8	—
Melbourne		53·8	160	—	—	17 6	0	34·3	39·7
Tiflis		73·4	311	e 12 12	+34	e 21 6	− 1	24·0	49·9
Honolulu	E.	75·4	71	—	—	—	—	—	55·2
Helwan		85·4	300	e 13 12	+22	23 16	− 7	55·2	57·2
Konigsberg	E.	87·2	326	—	—	—	—	e 43·2	53·7
	N.	87·2	326	—	—	e 23 30	−13	e 40·2	49·2
Vienna		91·9	321	13 36	+10	e 24 32	− 2	e 42·7	51·2
Bergen		92·5	334	16 12	?	—	—	40·2	57·2
Zagreb		93·0	319	13 42	+10	24 6	−39	e 42·2	60·5
Hamburg		93·5	327	e 13 42	+ 7	e 24 36	−15	e 46·2	58·1
Victoria		95·9	38	—	—	(e 24 58)	−17	e 25·0	55·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Rocca di Papa		96·7	316	e 13 54	+ 1	24 54	−29	e 48·5	65·2
De Bilt	E.	96·8	327	—	—	e 24 55	−29	e 47·2	60·7
	N.	96·8	327	—	—	e 25 2	−22	e 45·2	53·5
Florence		96·8	318	32 12?	?S	—	—	48·2	53·9
Strasbourg		97·0	323	—	—	e 34 12	?	47·2	—
Uccle		97·8	326	—	—	e 25 0	−34	e 46·2	60·8
Moncalieri		98·5	320	e 17 59	?PR_1	30 15	?SR_1	49·2	62·4
Edinburgh		98·6	333	—	—	e 25 12	−30	47·2	59·1
Besançon		98·6	322	—	—	—	—	54·2	—
Eskdalemuir		99·1	332	e 17 12	?PR_1	e 24 24	−83	45·2	53·7
Stonyhurst		99·6	331	e 25 42	?S	(e 25 42)	−10	54·4	59·7
Paris		99·8	325	—	—	e 24 12	−102	e 48·2	61·2
Kew		99·8	328	—	—	—	—	—	60·2
Oxford		100·3	329	—	—	—	—	50·2	61·5
Barcelona		103·7	318	—	—	—	—	e 57·4	65·6
Tortosa		105·2	320	33 58	?SR_1	—	—	e 48·2	61·2
Algiers		105·5	313	—	—	—	—	e 64·2	67·2
Cape Town		108·8	238	61 12	?L	—	—	(61·2)	—
Granada		109·8	319	—	—	—	—	e 56·2	107·9
Coimbra	E.	111·2	322	e 31 22	?	e 40 19	?	e 53·2	61·9
	N.	111·2	322	—	—	—	—	e 55·2	66·4
San Fernando		111·9	318	51 18	?L	—	—	(51·3)	73·7
Chicago		119·3	26	30 17	?S	—	—	e 54·2	—
Ottawa		120·2	15	e 20 31	?PR_1	e 26 10	−161	e 55·2	—
Toronto		120·7	19	—	—	—	—	46·2	—
Ithaca		122·7	15	—	—	—	—	66·2	—
Georgetown		125·7	18	e 21 34	?PR_1	28 3	−88	—	—
La Paz		168·2	113	20 38	[+24]	—	—	81·1	103·3

Additional readings and notes: Zi-ka-wei gives also MN = +14·3m., MZ = +14·0m. Batavia i = +8m.19s. Kobe MN = +14·3m. Osaka MN = +12·8m. Colombo L = +26·8m. Melbourne PR_1 = +11m.0s. Tiflis e = +23m.36s., MN = +44·6m. All readings are originally given for 14h., and have been increased by 3h. Zagreb PR_1 = +17m.6s., PR_3 = +21m.36s., MNW = +53·2m. Hamburg MN = +58·0m., MZ = +58·3m. Rocca di Papa ePR_1 = +18m.0s. Uccle MN = +53·8m. Eskdalemuir MN = +63·5m. Paris MN = +52·2m. San Fernando MN = +70·6m. Ottawa e = +30m.35s. Toronto L = +33·3m.

Aug. 29d. Readings also at 10h., 17h. (3), 18h., 20h., and 22h. (2) (Manila).

Aug. 30d. 10h. 27m. 25s. Epicentre 3°·0N. 122°·0E. (as on 1921 Nov. 16d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		11·3	5	e 3 11	+22	—	—	6·8	7·7
Batavia		17·7	239	i 5 27	+74	e 9 1	?L	(9·0)	—
Hong Kong		20·8	339	5 5	+14	—	—	10·0	—
Taihoku		22·0	359	—	—	e 8 39	−26	—	—
Zi-ka-wei		28·0	2	e 10 59	?S	(10 59)	0	(e 13·8)	16·3
Colombo		42·3	278	9 35	+82	15 53	+74	30·2	34·1
Melbourne		46·0	152	—	—	e 15 29	+ 1	28·3	31·3
Riverview		46·0	146	e 18 50	?SR_1	—	—	e 29·2	—
Honolulu	E.	79·5	69	—	—	e 22 15	− 3	e 40·2	41·6
Zagreb		99·0	318	—	—	—	—	50·6	—
Hamburg		100·3	326	—	—	—	—	e 52·6	—
De Bilt		103·7	325	—	—	e 29 35	+185	e 50·6	59·9
Uccle		104·6	324	—	—	—	—	—	54·6
Edinburgh		106·1	332	—	—	—	—	e 62·6	—
Eskdalemuir		106·6	332	—	—	—	—	49·6	—
Stonyhurst		106·8	330	e 57 35	?L	—	—	(e 57·6)	68·1
Coimbra		117·4	319	33 3	?S	e 45 35	?	63·6	—

Additional readings and notes: Manila gives also MN = +7·8m. Batavia gives iS = +9m.34s. All readings given as on 31 days. Taihoku reading is given as at 11h. Zi-ka-wei readings are given as eP and eS respectively. Melbourne iS = +19m.17s.? Honolulu eE = +35m.15s.

Aug. 30d. 22h. 40m. 42s. Epicentre 20°·0N. 114°·0W.

A = −·382, B = −·858, C = +·342 ; D = −·914, E = +·407 ;
G = −·139, H = −·312, K = −·940.

Very doubtful.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mazatlan		7·7	64	—	—	—	—	2·6	—
Tucson	N.	12·6	12	—	—	e 5 31	− 3	e 7·0	9·0
Vera Cruz	E.N.	16·8	89	—	—	—	—	8·7	10·5
Lick	E.	18·6	341	—	—	—	—	e 11·1	—
Berkeley		19·3	340	e 5 54	+81	—	—	e 10·4	—
Victoria		29·4	347	—	—	—	—	15·0	18·4
Chicago		31·1	40	11 36	?S	(11 36)	−17	15·0	—
Ann Arbor		33·9	42	—	—	—	—	e 16·3	—
Georgetown	N.	36·9	52	—	—	—	—	e 18·1	—
Washington		36·9	52	—	—	—	—	e 18·1	—
Toronto		37·2	43	—	—	—	—	e 15·5	19·6
Ithaca		38·6	48	e 7 48	+ 5	e 13 54	+ 8	19·6	—
Ottawa		40·4	42	—	—	e 13 56	−17	e 17·3	—
Honolulu	N.	41·1	280	—	—	—	—	e 23·2	26·8
Eskdalemuir		84·7	33	—	—	—	—	38·3	—
De Bilt		90·6	32	—	—	—	—	e 45·3	—

Additional readings : Tucson gives also eE = +6m.13s., ME = +6·6m. Lick iE = +14m.9s. Berkeley eLN = +11·0m. Chicago S = +14m.6s. (?SR_1). Toronto eL = +19·3m. Ithaca e = +10m.18s. and +16m.36s. Ottawa e = +10m.3s. and +16m.33s. Honolulu eE = +22m.58s.

Aug. 30d. Readings also at 0h. (near Mizusawa and Tokyo), 2h. and 3h. (Manila), 5h. (Manila (2)), 8h. (Paris), 9h. (Riverview), 10h. (De Bilt), 14h. (Tiflis), 15h. and 17h. (Manila), 18h. (La Paz).

Aug. 31d. Readings at 2h. (Kodaikanal and Colombo), 3h. (Manila (2)), 4h. (Taihoku), 6h. (Vera Cruz and Merida), 8h. (Manila), 9h. (near Athens), 16h. (near La Paz), 17h. (Algiers and Manila), 20h. (Azores, Manila, near Tokyo, and Mizusawa).

1922. Sept. 1d. 19h. 16m. 0s. Epicentre 25°·0N. 121°·5E.

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

See note at end.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		0·1	22	0 21	+19	—	—	—	—
Zi-ka-wei		6·2	359	1 0?	−35	2 0?	−49	—	—
Hong Kong		7·1	249	1 56	+ 8	—	—	—	—
Manila		10·4	183	i 2 25	−11	(i 4 49)	+ 9	i 4·8	7·5
Nagasaki		10·7	42	2 44	+ 4	(4 53)	+ 5	4·9	7·0
Kobe		15·3	48	3 45	+ 2	6 54	+15	e 8·8	9·6
Osaka		15·5	48	3 41	− 5	(6 56)	+12	6·9	—
Nagoya		16·8	49	3 6	−56	(7 53)	+40	7·9	10·2
Tokyo		19·0	51	i 4 23	− 6	e 7 37	−25	e 10·9	17·5
Mizusawa	E.	21·8	45	4 54	− 9	9 42	+41	—	—
	N.	21·8	45	4 53	−10	9 40	+39	—	—
Ootomari		27·5	33	6 5	+ 2	(11 6)	+16	11·1	16·7
Calcutta	E.	30·3	273	6 24	− 7	11 48	+ 9	—	—
	N.	30·3	273	6 27	− 4	11 39	0	17·2	20·0
Batavia		34·3	207	i 6 52	−15	11 52	−52	e 19·0	—
Dehra Dun		38·5	288	8 0	+18	—	—	—	—
Simla	E.	39·2	290	7 36	−12	13 30	−24	24·4	25·5
Colombo		43·6	254	8 36	+13	13 30	−86	15·3	32·5
Kodaikanal		44·2	260	7 18	−69	(15 0)	− 5	15·0	29·9
Bombay		45·2	273	8 22	−12	15 6	−12	24·4	26·8
Adelaide		62·2	165	—	—	i 18 30	−21	e 30·5	41·0
Tiflis		64·0	307	10 46	+ 8	e 19 26	+13	32·0	40·5
Sydney		65·4	153	10 48	+ 1	19 24	− 6	26·8	32·5
Melbourne		66·6	160	10 36	−19	i 19 24	−21	31·4	35·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Honolulu	E.	72·9	75	—	—	—	—	34·0	43·6
	N.	72·9	75	11 34	− 1	21 12	+11	33·9	36·0
Upsala		75·1	330	i 11 53	+ 3	21 30	+ 3	e 34·4	48·6
Lemberg		75·6	319	e 12 5	+12	e 22 0	+27	e 45·6	50·0
Konigsberg	E.	75·6	325	i 11 54	+ 1	—	—	e 27·3	48·8
	N.	75·6	325	i 11 54	+ 1	e 22 39	+66	e 32·8	42·3
Sitka	E.	75·9	34	—	—	21 38	+ 2	42·4	49·2
	N.	75·9	34	—	—	21 43	+ 7	46·6	60·1
Helwan		77·9	297	i 12 8	+ 2	22 5	+ 6	—	23·2
Budapest		79·6	319	e 11 13	−64	e 24 21	+122	39·8	—
Belgrade		79·9	315	i 12 19	+ 1	i 22 34	+12	e 31·6	49·3
Bergen		80·1	334	8 37	?	—	—	47·5	50·9
Athens		80·5	309	e 12 21	− 1	e 22 34	+ 5	e 32·0	50·2
Vienna		80·8	320	12 25	+ 1	22 57	+24	e 40·0	54·8
		80·8	320	i 12 28	+ 4	22 39	+ 6	i 43·9	44·2
Hamburg		81·8	327	i 12 29	0	i 22 46	+ 2	e 39·0	52·0
Wellington		82·7	143	e 12 36	+ 2	i 22 36	−18	40·4	50·0
Innsbruck		84·2	321	i 12 42	− 1	e 22 57	−13	e 39·0	54·7
Padova		84·9	319	12 46	− 1	23 22	+ 4	—	56·3
De Bilt		85·0	327	12 47	− 1	23 21	+ 2	e 39·0	54·2
Dyce	N.	85·1	334	i 12 47	− 2	23 15	− 5	29·4	47·9
Pompeii		85·6	313	i 12 48	− 3	i 23 13	−13	37·0	59·0
Strasbourg	E.	85·6	323	i 12 47	− 4	e 23 41	+15	e 30·0	45·5
	N.	85·6	323	i 12 49	− 2	e 23 45	+19	e 32·0	46·4
Zurich		85·8	321	i 12 49	− 3	23 29	+ 1	—	—
Florence		86·1	319	12 55	+ 1	23 12	−19	41·8	47·8
Uccle		86·1	326	i 12 51	− 3	23 29	− 2	e 39·0	53·9
Rocca di Papa		86·3	315	i 12 51	− 4	23 12	−21	e 45·6	60·1
Edinburgh		86·4	333	i 12 57	+ 2	i 23 32	− 2	40·0	56·1
Victoria		86·6	37	12 24	−33	(22 49)	−48	e 44·1	55·1
	Z.	86·6	37	12 40	−17	—	—	—	57·5
Eskdalemuir		86·8	333	i 12 54	− 4	23 38	− 1	39·5	46·7
Besançon		87·4	323	e 12 59	− 2	23 37	− 8	43·0	—
Stonyhurst		87·5	330	(12 54)	− 8	12 54	?P	44·2	52·0
Moncalieri		87·6	320	13 3	0	24 5	+17	30·2	59·4
Kew		88·0	329	17 0	?PR_1	—	—	—	58·0
West Bromwich		88·1	329	13 1	− 5	23 40	−13	—	—
Paris		88·3	325	i 13 0	− 7	e 23 27	−28	41·0	49·0
Oxford		88·3	329	13 1	− 6	23 43	−12	41·4	56·8
Puy de Dôme		89·9	323	13 0	−15	—	—	—	—
Marseilles		89·9	320	e 13 0	−15	23 41	−32	40·0	47·0
Berkeley		93·3	45	e 13 25	− 9	e 24 31	−17	e 39·4	—
Tortosa	N.	94·3	321	13 28	−12	23 54	−65	38·6	63·2
Algiers		95·2	316	13 31	−13	e 26 13	+65	47·0	56·0
Granada		99·1	319	17 50	?PR_1	i 27 0	+73	i 33·5	51·3
Coimbra	E.	99·8	325	e 13 48	−22	24 48	−66	47·5	65·7
	N.	99·8	325	—	—	—	—	48·3	59·8
Rio Tinto		100·5	321	46 0	?L	—	—	(46·0)	69·0
San Fernando		101·1	320	18 18	?PR_1	28 0	+114	50·0	60·5
Johannesburg		103·6	247	—	—	—	—	33·0	54·0
Tucson		104·1	43	—	—	e 44 47	?	51·4	52·3
Ottawa		107·9	13	18 56	?PR_1	28 25	+76	e 42·3	—
Chicago		108·0	22	18 56	?PR_1	28 35	+85	42·2	—
Toronto		108·7	15	18 54	?PR_1	28 42	+86	i 46·1	67·6
Ann Arbor		108·8	20	19 0	?PR_1	28 24	+67	e 41·7	—
Northfield		109·6	11	e 23 0	?	28 55	+91	e 61·0	—
St. Louis		109·8	26	i 15 0?	+ 4	27 6	−20	e 50·0	60·0
Ithaca		110·5	14	e 19 19	?PR_1	28 56	+83	50·0	—
Georgetown		113·8	15	e 18 41	?PR_1	29 35	+95	e 41·3	72·3
	Z.	113·8	15	e 18 52	?PR_1	28 38	+38	66·0	—
Washington		113·8	15	20 44	?PR_1	30 30	?	44·8	—
Cape Town		113·9	242	29 28	?S	(29 28)	+87	—	62·0
Cheltenham	E.	114·0	15	—	—	e 28 22	+20	55·8	56·3
	N.	114·0	15	—	—	e 29 32	+90	66·2	71·9
Merida		125·0	36	—	—	—	—	—	80·0
Porto Rico	N.	136·3	9	—	—	—	—	76·4	78·4
Cipolletti		163·9	152	45 18	?SR_1	—	—	99·6	112·5
La Paz		167·7	49	i 20 18	[+ 4]	i 34 44	?	77·5	84·0
Mendoza		168·4	135	19 30	[−44]	—	—	28·4	110·3
Chacareta	E.	170·4	180	—	—	—	—	81·3	93·0
Pilar	E.	171·9	146	20 54	[+38]	—	—	31·9	46·7
	N.	171·9	146	21 30	[+74]	—	—	31·9	56·9
Andalgala	N.	172·6	113	21 24	[+68]	—	—	82·3	93·0
La Quiaca	E.	172·9	68	—	—	—	—	100·2	120·9
	N.	172·9	68	—	—	—	—	99·7	100·0

For Notes see next page.

NOTES TO SEPT. 1d. 19h. 16m. 0s.

Additional readings and notes: Manila gives also iS = +2m.50s., MN = +5·5m. Nagasaki MN = +16·8m. Kobe MN = +10·6m. Tokyo iPR = +4m.24s., MN = +12·6m. Ootomari MN = +16·2m. Batavia i = +8m.11s. and +12m.17s. Adelaide iSR_3 = +25m.54s. Tiflis PR_1 = +13m.9s., e = +13m.32s., +15m.15s., +19m.43s., +23m.33s., +24m.8s., +27m.28s., and +30m.39s., MN = +43·6m. Sydney readings have been diminished by 2h. Honolulu SR_1N = +25m.50s., SR_2N = +29m.20s., T_0 = 19h.15m.54s. Upsala PR_2 = +16m.53s., PR_3 = +18m.5s., SR_1 = +26m.48s., SR_2 = +30m.17s., MN = +42·7m. Sitka eE = +17m.27s., eN = +15m.3s., PSE? = +22m.33s., SR_1E = +27m.2s., SR_2N = +30m.57s., eE = +36m.59s., eN = +33m.7s., T_0 = 19h.15m.51s. Budapest readings have been increased by 10m Belgrade PR_1 = +13m.12s. and +14m.36s. Bergen PR_1 = +15m.0s., SR_1 = +38m.32s. Athens i = +23m.40s., T_0 = 19h.16m.6s. Vienna iN = +1?m.51s., PR_1E = +15m.39s., PR_1N = +15m.51s., iZ = +17m.32s., iE = +21m.53s., iN = +21m.59s., iN = +22m.59s., PSE = +23m.45s., PSN = +23m.48s., SR_1 = +28m.35s., iE = +31m.51s., iZ = +42m.21s., MZ = +74·8m. Hamburg PR_1 = +16m.2s., PR_3 = +19m.23s., PS = +23m.43s., SR_1 = +28m.48s., SR_2 = +32m.58s., SR_3 = +34m.42s., MN = +45·7m., MZ = +51·9m. Wellington ePR_1 = +15m.36s., e = +21m.36s., iSR_1 = +28m.48s., SR_2 = +32m.36s., L = +43·4m., and +45·9m., T_0 = 19h.16m.22s. De Bilt PR_1 = +16m.8s., PR_2 = +18m.23s., PR_3 = +19m.47s., SR_1 = +29m.17s., MN = +47·8m. Strasbourg PR_1E = +16m.22s., PR_3E = +19m.41s., SR_1E = +29m.41s. Zurich PR_1 = +16m.12s. Uccle PR_1 = +16m.13s., PR_2 = +18m.31s., PR_3 = +19m.57s., SR_1 = +29m.41s., SR_2 = +34m.11s., MN = +47·0m. Rocca di Papa L = +29·1m., eLN = +47·1m. Edinburgh PR_1 = +16m.38s., SR_1 = +29m.43s. Eskdalemuir PR_1 = +16m.24s., PR_3 = +19m.52s., PS? = +22m.48s., i = +23m.22s., and +24m.59s., SR_1 = +29m.34s., SR_2 = +33m.34s., MN = +45·8m. Victoria S is given as L: also S is given as +16m.52s. (?PR_1), e = +28m.56s., iL = +57·3m., eL = +73·8m., and +75·5m. Stonyhurst eP = +2m.0s. Moncalieri MN = +67·3m. Paris PR_1 = +16m.35s. Oxford PR_1 = +16m.53s. Marseilles MN = +59m.0s. Berkeley iS = +23m.54s. Algiers ? = +24m.0s., MN = +64·0m. Coimbra PR_1 = +18m.0s., iE? = +27m.4s., iN? = +27m.16s., T_0 = 19h.16m.44s. Ottawa L = +49·0m., T_0 = 19h.23m.26s. Toronto i = +20m.42s. and +24m.0s., iL = +65·0m., eL = +90·7m., and +118·9m. Ann Arbor L = +48·0m., +59·7m., and +71·6m., T_0 = 19h.23m.36s. Ithaca e = +35m.18s., L = +58·0m., and +63·0m. Georgetown LE = +56·0m., LN = +57·0m. Cheltenham PR_1E = +20m.0s., eN = +25m.1s., PSN? = +30m.46s., SR_1E = +35m.58s., SR_1N = +36m.58s., eE = +40m.38s., LN = +56·0m., T_0 = 19h.16m.34s La Paz i = +26m 11s. and +32m.17s., SEN = +35m.0s., iSR_1 = +45m.59s., LN = +68·0m. and +79·0m.

NOTE.—Originally 25°·0N. 121°·0E. was adopted for the epicentre of this shock, and for Sept. 14d. and 16d. the slightly different position 25°·0N. 121°·5E. After the reductions had been made direct comparisons were made, first between Sept. 14d. and 16d., which were found to be satisfactorily in accord, and then between the mean of these two and Sept. 1d. This last comparison gave :—

for Az. 277° (7 stations) differences of −2s. and + 4s. for P and S.
Az. 320° (10 stations) differences of +4s. and 0s.
Az. 50° (6 stations) differences of 0s. and +12s.(?)

This evidence was not considered sufficient to justify a separate epicentre for Sept. 1d., and accordingly the same epicentre has been adopted for all three.

The following note on the earthquakes of Sept. 1, 14, and 16 were circulated by the Taihoku Meteorological Observatory (Formosa, Japan). The times given were those of 120°E., and have been altered to Greenwich Time.

THE EARTHQUAKES OF NORTH FORMOSA.

September 1st and 14th, 1922.

On the 1st of September, at 19h. 16m. 21s. a.m. (G.M.T.) an earthquake of intensity VII-VIII (Rossi-Forel) occurred in North Formosa causing some damage and followed by many aftershocks. Again, on the 14th of September, at 19h.31m.48s. a.m. the earthquake of nearly the same intensity, from the same origin, caused more danger than the former. The area felt strongly was one-third of the Island in the north part and very slight in South Formosa. On the 16th strong aftershocks of intensity III-VI occurred five times and on the 17th two times. The approximate origin calculated from the preliminary tremor

durations at various stations was 24°·5N. and 122°·3E. (off the east coast of North Formosa). Information came from Dainano and Gokots on the east coast near the epicentre that the aftershocks occurred very frequently, with sounds like distant thunder sometimes, at intervals of 5 or 10 minutes on the 14th and the following several days. Many landslips in the steep mountains and in numerous places of the cliff roads along the seashore made it impossible for travellers to pass. The Omori seismographs at Taihoku and Karenko (magnifications 120 and 50 respectively) recorded numerous aftershocks unprecedented in the Island. A policeman residing at Gokots station counted the number of aftershocks very carefully and reported to the observatory. The following list gives the number of the aftershocks classified according to the intensity at these three stations.

Intensity. (Rossi-Forel.)		Taihoku.	Karenko.	Gokots.	Taihoku.	Karenko.	Gokots.
		(September).			(October and November).		
Minor		1378	266	—	560	213	—
0 unfelt		129	303	—	68	99	—
1 felt	(I-II)	63	75	194	25	41	94
2	(III-IV)	7	6	68	5	5	57
3	(V)	2	5	62	1	1	21
4	(VI)	1	1	9	—	—	4
5	(VII-VIII)	1	—	1	—	—	—
	Total	1581	656	334	659	359	176

The seismographs at Taihoku and Karenko are still recording two or three shocks every day even at present. The damage given below was caused principally on the 1st and 14th September, with a little damage by the aftershocks on 15th, 16th, 17th September, 14th October, and 1st and 12th December.

People killed	17	Houses destroyed	47
,, injured	34	,, destroyed partially	41
		,, injured	811

A large part of the damage was due to the fragile and bad construction of the old Chinese houses, built of sun-dried mud blocks which mostly have no capacity for resisting earthquake shocks. There was no particular damage in the Japanese houses (which are built of bricks or timbers) except the crackings of plastered walls.

Sept. 1d. Readings also at 1h. (De Bilt and Uccle), 2h. (near Lick (2)), 3h. (Manila), 4h. (Lick), 5h. (La Paz), 6h. (Mizusawa), 12h. (Simla, Upsala, and Hamburg), 13h. (Konigsberg, Oxford, Uccle, De Bilt, Kew, and Eskdalemuir), 19h. (Colombo, Taihoku, and near Athens), 20h. (7) and 21h. (3) (Taihoku), 22h. (Vera Cruz, Merida, Tacubaya, and near Oaxaca).

Sept. 2d. 17h. 22m. 42s. Epicentre 3°·0S. 128°·0E. (as on 1922 May 21d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		18·9	339	e 4 34	+ 6	(7 24)	−36	7·4	8·2
Batavia		21·3	260	5 0	+ 3	i 8 44	− 6	—	—
Hong Kong		28·7	333	—	—	(10 28)	−44	10·5	—
Melbourne		38·1	159	—	—	—	—	e 16·7	29·0
De Bilt	E.	112·0	324	—	—	e 25 48	−118	e 55·3	58·2
	N.	112·0	324	—	—	e 30 0	+134	e 56·3	58·0
Uccle		113·0	325	—	—	e 29 18	+84	e 54·3	—
Eskdalemuir		114·7	332	—	—	e 27 18	−50	53·3	—

Additional readings: Manila gives also MN = +7·9m. Batavia i = +6m.11s.

Sept. 2d. Readings also at 0h. (near Athens), 1h. (near Taihoku), 5h. (De Bilt and Uccle), 7h. (near Athens), 11h. (La Paz and Eskdalemuir), 13h. (Algiers), 20h. (Honolulu), 21h. (Uccle, De Bilt, and Eskdalemuir), 22h. (near Tokyo (2)), 23h. (La Paz, Batavia, Manila, and near Tokyo (2)).

Sept. 3d. 3h. 11m. 0s. Epicentre 42°·4N. 21°·4E. (as on 1921 Sept. 2d.).

$A = +\cdot688$, $B = +\cdot269$, $C = +\cdot674$; $D = +\cdot365$, $E = -\cdot931$; $G = +\cdot628$, $H = +\cdot246$, $K = -\cdot738$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Belgrade	2·5	344	i 1 3	+24	i 1 44	+35	(i 1·7)	1·9
Mostar	2·7	290	e 0 18	−24	i 0 48	−26	—	1·0
Sinj	3·7	291	e 1 20	?S	(e 1 20)	−22	(i 1·9)	2·0
Athens	4·8	157	e 1 39	+25	2 27	+16	e 2·7	3·1
Pompeii	5·3	255	e 1 15	− 7	2 45	+20	(2·8)	—
Rocca di Papa	6·4	262	i 1 42	+ 4	2 48	− 7	—	—
Vienna	6·8	331	2 4	+20	4 1	?L	(4·0)	—
Padova	7·5	297	3 22	?S	(3 22)	− 2	5·0	8·2
Innsbruck	8·6	308	e 2 18	+ 8	i 4 47	?L	(i 4·8)	—
Zurich	10·3	303	e 2 40	+ 6	4 44	+ 7	—	—
Strasbourg	11·3	308	e 4 0?	+71	e 5 21	+19	—	—
Hamburg	13·5	330	—	—	—	—	e 7·0	9·2
Uccle	14·4	311	—	—	—	—	e 7·3	—
De Bilt	14·6	317	—	—	—	—	e 7·8	9·9
Eskdalemuir	20·5	317	—	—	—	—	e 12·0	—

Additional readings: Belgrade gives also iP = +1m.14s. Mostar iP = +24s. Sinj iP = +1m.52s. Athens MN = +3·4m. Rocca di Papa SE = +3m.0s. Vienna PR_1 = +3m.17s., SR_1 = +4m.9s. Strasbourg readings have been increased by 10m. De Bilt MN = +9·8m. Eskdalemuir e = 2h.58m., L = 4h.2m.

Sept. 3. Readings also at 0h. (near Tokyo (2) and near Batavia), 1h. (Colombo and near Mizusawa), 2h. (Manila and near Tokyo (2)), 3h. (Georgetown, Washington, Chicago, Ann Arbor, Ottawa, Sitka, and near Tokyo), 4h. (De Bilt and near Tokyo), 5h. (near Tokyo), 6h. (near Mizusawa, Tokyo, and Nagasaki), 9h. (Athens), 10h. (near Batavia), 11h. (Algiers), 14h. (Manila), 15h. (Kobe).

Sept. 4d. 17h. 4m. 8s. Epicentre 9°·0S. 66°·0W.

$A = +\cdot402$, $B = -\cdot902$, $C = -\cdot156$; $D = -\cdot914$, $E = -\cdot407$; $G = -\cdot064$, $H = +\cdot143$, $K = -\cdot988$.

This determination is rough. A depth of focus 0·080 is found necessary. It will be seen that the value of T_0 is supported by Georgetown, Ottawa, Berkeley, Coimbra, Tortosa, Tacubaya, and Zurich, though there are many discordant observations elsewhere, especially those of P. We could satisfy most of the observations by moving the epicentre some 8° north, but this would be quite inconsistent with the La Paz records, and the observations of [P] at Batavia and Manila indicate a very deep focus.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz	−0·1	7·8	195	i 1 54	− 3	—	—	3·2	3·0
Vera Cruz	−6·1	41·0	315	—	—	—	—	—	13·4
Tacubaya E.	−6·4	43·3	312	7 5	−24	12 35	−47	—	—
N.Z.	−6·4	43·3	312	7 4	−25	12 34	−48	—	—
Georgetown N.	−7·1	49·0	350	e 8 8	− 2	i 14 32	− 2	—	—
Washington	−7·1	49·0	350	8 5	− 5	15 26	+52	—	—
Ithaca	−7·4	52·3	352	e 10 20	+108	i 15 5	− 9	—	—
St. Louis	−7·4	52·7	337	—	—	i 14 58	−21	—	—
Ann Arbor E.	−7·5	53·8	345	i 9 52	+70	i 15 34	+ 2	—	—
Chicago	−7·6	54·5	341	10 27	+101	15 20	−20	—	—
Ottawa	−7·6	55·1	353	i 8 52	+ 1	i 15 52	+ 4	—	—
Berkeley	−8·5	70·3	317	10 9	−15	i 18 24	−22	—	—
San Fernando	−8·6	72·1	48	20 16	?S	(20 16)	+69	—	—
Coimbra	−8·6	72·3	43	10 58	+22	i 19 54	+45	e 28·4	—
Granada	−8·7	74·3	48	i 10 0	−49	i 19 4	−26	e 42·9	45·7
Tortosa N.	−9·1	78·7	45	i 11 29	+14	i 20 50	+29	—	—
Algiers	−9·1	79·1	50	13 45	?PR_1	20 52	+26	—	—
Barcelona	−9·2	80·0	45	e 13 51	?PR_1	e 20 57	+21	—	—
Cape Town	−9·2	80·4	125	—	—	—	—	—	21·0
Oxford	−9·3	82·0	36	13 49	?PR_1	i 21 7	+ 9	—	—

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Stonyhurst		−9·3	82·3	34	e 20 52	?S	(e 20 52)	−10	—	—
Edinburgh		−9·3	82·9	31	14 3	?PR$_1$	i 21 7	− 2	—	—
Paris		−9·3	83·1	39	i 14 3	?PR$_1$	i 21 13	+ 1	—	—
Dyce	N.	−9·4	84·0	29	14 5	?PR$_1$	21 15	− 6	—	—
Uccle		−9·4	84·9	38	e 14 13	?PR$_1$	i 21 25	− 7	—	—
Moncalieri		−9·4	85·1	44	e 13 23	+90	21 37	+ 3	32·7	—
Besançon		−9·4	85·1	41	14 7	?PR$_1$	e 21 28	− 6	—	—
De Bilt		−9·4	85·8	37	—	—	i 21 31	−11	—	—
Strasbourg		−9·4	86·2	40	e 14 5	?PR$_1$	i 21 31	−16	e 29·9	—
Zurich		−9·5	86·4	42	e 12 5	+ 5	i 21 38	−10	—	—
Rocca di Papa		−9·6	87·7	48	e 14 32	?PR$_1$	i 21 46	−15	e 45·9	—
Padova		−9·6	88·0	44	—	—	22 22	+17	—	—
Hamburg		−9·7	89·0	36	e 14 34	?PR$_1$	i 21 52	−23	34·9	—
Vienna		−9·8	91·7	41	e 10 21	−129	i 22 4	−41	—	53·9
Konigsberg		−9·9	95·3	35	—	—	i 22 12	−71	—	—
Batavia	E.	—	163·2	155	i 19 1	[−69]	—	—	—	—
Manila		—	171·2	310	e 18 52	[−83]	—	—	—	—

Additional readings: Tacubaya gives also SR$_3$N. = +15m.54s., SR$_1$E = +15m.53s., SR$_3$Z = +15m.49s. Georgetown e = +7m.52s. (minutes only), iN = +10m.6s. Ithaca i = +17m.2s., e = +18m.10s. St. Louis i = +17m.4s. Ann Arbor i = +17m.28s. Chicago SR$_1$? = +17m.15s. Ottawa i = +10m.52s. and +17m.32s. Berkeley eSZ = +18m.23s. Coimbra PR$_1$ = +13m.9s., eLN = +28·9m., T$_0$ = 17h.4m.10s. Granada PR$_1$ = +12m.13s. Uccle SR$_1$ = +23m.4s. De Bilt ePR$_1$ = +14m.19s. Strasbourg e = +26m.36s. Zurich e = +14m.22s. (?PR$_1$). Hamburg iSR$_1$ = +26m.11s. Vienna PR$_1$ = +14m.48s., iPSE? = +22m.54s. Konigsberg iZ = +14m.54s. and +15m.55s., iN = +22m.13s.

Sept. 4d. 17h. 53m. 35s. Epicentre 24°·0N. 120°·0E. (as on 1922 May 22d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hokoto		0·6	222	e 0 0	− 9	—	—	1·0	—
Taihoku		1·8	53	e 0 29	+ 1	—	—	0·7	—
Hong Kong		5·6	254	2 32	?S	(2 23)	−11	4·8	5·8
Zi-ka-wei		7·3	10	1 47	− 4	e 3 27	+ 9	(e 3·4)	4·1
Manila		9·5	172	e 2 53	+30	—	—	7·1	—
Nagasaki		12·3	42	2 47	−16	(4 51)	−35	4·8	9·2
Tokyo		20·7	51	—	—	e 8 23	−15	—	—
Tiflis		63·6	309	—	—	—	—	e 34·4	—
Konigsberg		75·8	325	—	—	—	—	e 40·4	43·1
Vienna		80·8	320	e 12 49	+25	—	—	e 46·4	—
Hamburg		81·9	328	—	—	—	—	e 42·4	45·4
De Bilt		85·2	326	—	—	—	—	e 40·4	49·8
Dyce	N.	85·6	334	—	—	—	—	—	45·0
Strasbourg		85·7	322	—	—	—	—	e 45·4	—
Zurich		85·9	322	—	—	—	—	e 49·7	—
Florence		86·1	319	—	—	—	—	—	50·4
Uccle		86·3	327	—	—	—	—	e 40·4	48·4
Edinburgh		86·8	332	—	—	—	—	45·4	49·1
Besançon		87·4	322	—	—	—	—	48·4	—
Stonyhurst		87·8	330	—	—	—	—	—	51·9
Kew		88·2	329	48 25	?L	—	—	(48·4)	56·4
Paris		88·4	326	—	—	—	—	—	49·4
Oxford		88·6	329	—	—	—	—	44·4	50·2
Tortosa	N.	94·3	320	—	—	—	—	e 49·4	55·6
Coimbra		99·8	323	—	—	—	—	e 49·4	—
San Fernando		101·0	320	—	—	—	—	—	59·4
Ottawa	E.	109·1	12	—	—	—	—	59·4	—
Chicago		109·4	22	—	—	—	—	e 57·4	—
La Paz		169·3	47	43 49	?SR$_1$	—	—	—	—

Additional readings: Zi-ka-wei gives also MN = +4·2m. Tiflis eL = +37·4m. Coimbra eLN = +52·4m. San Fernando MN = +58·9m.

Sept. 4d. Readings also at 2h. (Hong Kong, Manila, Batavia, and Zante), 3h. (De Bilt and Uccle), 12h. (Zi-ka-wei, Taihoku (2), and near Mizusawa), 14h. (near Belgrade), 15h. (Manila), 17h. (Uccle), 20h. (Taihoku), 21h. (Zi-ka-wei and Lick).

Sept. 5d. 15h. 56m. 50s. Epicentre 41°·0N. 23°·0E. (as on 1921 Mar. 30d.).

$A = +\cdot695$, $B = +\cdot295$, $C = +\cdot656$; $D = +\cdot391$, $E = -\cdot920$; $G = +\cdot604$, $H = +\cdot256$, $K = -\cdot755$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Belgrade	4·3	335	i 0 53	−14	i 1 55	− 3	—	3·6
Rocca di Papa	7·8	279	e 2 52	+54	(e 3 28)	− 3	—	4·9
Vienna	8·6	329	e 2 20	+10	—	—	i 4·2	5·3
Padova	9·2	302	4 34	?L	—	—	(4·6)	7·4
Strasbourg	13·1	310	—	—	—	—	e 7·0	—
Hamburg	15·3	330	—	—	—	—	e 8·2	10·3
De Bilt	16·5	318	—	—	—	—	e 8·2	9·0
Eskdalemuir	22·4	319	—	—	—	— e	12·2	—

Additional readings and notes: Belgrade gives also iP = +1m.40s. Rocca di Papa readings are given as eP and ePV respectively.

Sept. 5d. Readings also at 2h. (Melbourne, Wellington, Azores, and Adelaide), 3h. (De Bilt), 4h. (Uccle and Eskdalemuir), 7h. (Manila and Zi-ka-wei), 8h. (near La Paz), 9h. (Berkeley), 10h. (near Nagoya, Mizusawa, and Tokyo), 15h., 16h., 19h., and 21h. (Azores), 23h. (Zi-ka-wei).

Sept. 6d. 22h. 12m. 5s. Epicentre 24°·0N. 123°·0E. (as on 1922 April 10d.).

$A = -\cdot498$, $B = +\cdot766$, $C = +\cdot407$; $D = +\cdot839$, $E = +\cdot545$; $G = -\cdot224$, $H = +341\cdot$, $K = -\cdot913$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		1·7	308	−0 31	−57	—	—	—	—
Hokoto		3·2	262	—	—	e 2 43	?	3·0	3·3
Zi-ka-wei		7·3	349	1 47	− 4	e 3 15	− 3	—	4·2
Hong Kong		8·3	260	2 13	+ 7	4 25	+40	4·8	5·8
Manila		9·6	192	e 3 7	+43	—	—	5·3	—
Kobe	E.	15·0	42	—	—	—	—	—	10·9
Osaka		15·2	43	4 42	+60	—	—	7·9	13·8
Tokyo		18·6	47	e 4 35	+11	e 7 54	+ 1	—	8·2
Kodaikanal		45·5	261	29 19	?L	—	—	(29·3)	—
Tiflis		65·9	308	—	—	—	—	e 37·9	—
Honolulu	E.	71·9	75	—	—	—	—	e 41·9	—
Konigsberg	E.	77·4	325	—	—	—	—	e 42·4	46·4
	N.	77·4	325	—	—	—	—	e 39·4	42·7
Vienna		82·6	321	—	—	—	—	e 42·9	—
Hamburg		83·4	327	—	—	—	—	e 42·9	45·9
Dyce	N.	86·7	334	—	—	—	—	45·9	56·9
De Bilt		86·7	327	—	—	—	—	e 41·9	49·8
Strasbourg		87·4	323	—	—	—	—	e 47·7	—
Uccle		87·8	326	—	—	—	—	e 41·9	48·9
Edinburgh		88·0	333	—	—	—	—	e 44·9	48·9
Rocca di Papa		88·0	316	—	—	—	—	e 46·2	55·0
Eskdalemuir		88·4	333	—	—	—	—	40·9	47·9
Stonyhurst		89·1	330	e 46 55	?L	—	—	(e 46·9)	51·9
Moncalieri		89·3	320	—	—	46 58	?L	49·1	—
Kew		89·6	329	—	—	—	—	—	55·9
Oxford		90·0	329	—	—	—	—	43·0	50·2
Paris		90·0	326	—	—	—	—	e 46·9	49·9
Granada		100·9	320	—	—	—	—	52·9	60·3

Additional readings: Zi-ka-wei gives also MZ = +4·9m. Kobe MN = +9·2m. Osaka MN = +12·9m. Tiflis reading is given as on 7d. Dyce LN = +53·9m. De Bilt eLN = +40·9m. Moncalieri e = +43m.24s.

Sept. 6d. Readings also at 1h. (Honolulu), 5h. (Azores), 13h. (Manila, Batavia, and Azores), 14h. (Taihoku and near Tokyo), 18h. (Taihoku), 19h. (Colombo), 21h. (Taihoku, Hong Kong, and Zi-ka-wei).

Sept. 7d. Readings at 1h. (La Paz), 3h. (Zi-ka-wei), 14h. (Manila), 16h. (Zi-ka-wei), 18h. (Manila (2) and Algiers), 19h. (Zi-ka-wei (2), Taihoku (3), and Hong Kong), 20h. (Hong Kong (3), La Paz, De Bilt, and Eskdalemuir).

Sept. 8d. 6h. 0m. 26s. Epicentre 24°·0N. 46°·0W. (as on 1922 Jan. 9d.).

$A = +\cdot635$, $B = -\cdot657$, $C = +\cdot407$; $D = -\cdot719$, $E = -\cdot695$; $G = +\cdot283$, $H = -\cdot292$, $K = -\cdot914$.

La Paz and Strasbourg indicate a T_0 later by about 40sec., but this calls for a displacement of the epicentre about 5° both towards La Paz and Europe, *i.e.*, in opposite directions. This could be attained by a hypothesis of deep focus, but it is simpler to adopt the T_0 shown by Eskdalemuir and Uccle.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Eskdalemuir		44·2	34	e 8 29	+2	e 15 10	+ 5	20·1	—
Kew		44·3	40	—	—	—	—	—	47·6
La Paz		45·9	211	8 34	−5	e 14 45	−42	20·8	—
Uccle		46·9	42	e 8 46	0	e 15 40	0	e 22·6	—
De Bilt		47·7	41	—	—	e 15 56	+ 6	e 21·6	—
Strasbourg		48·5	46	e 9 2	+5	(e 15 34)	−26	e 15·6	—
Vienna	Z.	54·2	46	9 40	+6	—	—	—	—

Eskdalemuir gives also e = +18m.28s.

Sept. 8d. 14h. 14m. 13s. Epicentre 4°·0S. 68°·0E.

$A = +\cdot374$, $B = +\cdot925$, $C = -\cdot070$; $D = +\cdot927$, $E = -\cdot375$; $G = -\cdot026$, $H = -\cdot065$, $K = -\cdot998$.

Very rough. The readings at Rocca di Papa suggest a separate shock about 1° from Rocca, which may have affected some other European readings.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Colombo		16·1	47	3 47	− 6	(6 59)	+ 2	7·0	9·0
Kodaikanal		17·1	33	4 11	+ 5	—	—	8·3	10·4
Bombay		23·4	12	e 9 41	?S	(e 9 41)	+ 8	—	—
Calcutta	E.	33·2	37	7 15	+17	12 25	− 2	18·4	—
Simla		36·2	13	—	—	e 13 41	+28	—	—
Batavia		38·8	96	i 7 26	−18	i 14 4	+15	e 18·8	—
Helwan		48·8	318	e 8 33	−26	—	—	—	34·4
Hong Kong		52·3	58	9 57	+35	—	—	—	—
Cape Town		54·8	230	17 31	?S	(17 31)	+12	—	30·8
Manila		55·7	70	e 9 39	− 5	—	—	—	—
Zi-ka-wei		61·8	51	e 10 13	−11	e 18 8	−38	?	38·8
Rocca di Papa		67·9	320	e 10 29	−34	i 10 45	?	—	11·3
Vienna		68·9	328	10 51	−19	19 39	−34	e 42·8	51·8
Strasbourg		74·1	325	—	—	e 21 28	+13	37·8	—
Hamburg		75·1	330	e 11 29	−21	e 22 37	+70	e 37·8	48·8
De Bilt		76·4	327	—	—	e 20 23	−79	—	49·1
Paris		77·3	323	e 11 47	−16	—	—	—	—
Kew		79·9	325	—	—	—	—	—	55·8
Oxford		80·6	325	e 12 16	− 7	—	—	—	59·1
Eskdalemuir		82·8	327	e 12 17	−18	—	—	38·8	—
Dyce	N.	82·9	330	—	—	i 22 37	−19	50·4	53·9
Cipolletti		121·0	219	68 53	?L	—	—	78·1	79·3
Pilar	N.	122·0	228	68 47	?L	—	—	(68·8)	72·3
Mendoza		124·6	224	65 41	?L	—	—	78·2	80·8
Andalgala	E.	125·8	230	57 35	?L	—	—	61·7	63·3
La Quiaca	E.	127·7	236	66 5	?L	—	—	73·5	76·8
La Paz		132·0	244	19 18	[− 5]	—	—	68·9	72·2

Additional readings and notes: Bombay reading is increased by 10m. Simla gives also eN = +9m.59s. Zi-ka-wei MN = +38·7m. De Bilt MN = +52·3m. Dyce iN = 13h.59m.5s., LN = +27·3m. La Quiaca LN = +78·7m.

Sept. 8d. Readings also at 18h. (Vera Cruz), 20h. (Manila).

Sept. 9d. 0h. 15m. 47s. Epicentre 17°·5N. 116°·5W.

A = −·426, B = −·854, C = +·301; D = −·895, E = +·446; G = −·134, H = −·269, K = −·954.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mazatlan		11·0	57	(3 9)	+25	—	—	3·1	—
Tucson	E.	15·6	18	—	—	—	—	e 8·9	9·9
	N.	15·6	18	—	—	—	—	e 9·6	11·9
Tacubaya	E.	16·5	81	3 59	0	7 7	0	—	8·0
Berkeley	E.	21·0	347	—	—	—	—	e 16·3	—
Chicago		34·6	39	12 49	?S	(12 49)	0	(16·7)	—
Honolulu		39·3	283	—	—	—	—	e 22·2	23·7
Washington		40·4	50	—	—	—	—	e 20·3	—

Additional readings: Tacubaya gives also SN = 7m.10s. Honolulu MN = +23·9m. Florence (Δ = 102°·3) gives simply 0h.

Sept. 9d. Readings also at 1h. (Colima), 4h. and 6h. (Batavia), 7h. (near Kobe), 10h. (Tokyo), 11h. (near Osaka), 13h. (Batavia), 18h. (La Paz), 23h. (near Tokyo).

Sept. 10d. 6h. 8m. 56s. Epicentre 30°·6N. 144°·0E. (as on 1919 Feb. 9d.).

A = −·696, B = +·506, C = +·509; D = +·588, E = +·809; G = −·412, H = +·299, K = −·861.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokyo	6·2	330	e 1 35	0	2 49	0	—	2·8
Nagoya	7·5	311	2 35	+41	—	—	—	—
Osaka	8·3	302	2 26	+20	—	—	2·7	2·7
Kobe	8·6	302	—	—	—	—	2·8	3·7
Mizusawa	8·8	345	2 13	0	3 57	−1	—	—

Additional readings: Osaka gives also MN = +3·6m. Mizusawa SN = +3m.56s.

Sept. 10d. Readings also at 3h. (Azores), 5h. (Sydney and Adelaide), 6h. (Azores and La Paz), 13h. (near Oaxaca), 14h. (near Manila), 18h. (near La Paz), 19h. (near Algiers), 21h. (Azores and near Mizusawa), 22h. (near Mizusawa).

Sept. 11d. 14h. 44m. 10s. Epicentre 0°·0, 122°·4E. (suggested by Batavia).

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		14·7	354	e 3 53	+18	6 30	+ 5	7·1	7·3
Batavia		16·7	248	e 4 11	+10	i 7 19	+ 8	—	9·1
Hong Kong		23·7	341	5 27	+ 2	(9 40)	+ 2	·9·7	—
Taihoku		25·0	358	10 11	?S	(10 11)	+ 8	—	—
Zi-ka-wei		31·2	358	—	—	e 11 32	−22	—	—
Kobe	E.	36·7	20	—	—	—	—	—	8·8
Nagoya		37·7	22	7 21	−15	—	—	—	—
Adelaide		38·0	158	e 8 50	?PR_1	—	—	—	16·0
Tokyo		39·1	25	7 52	+ 5	e 15 13	+80	—	15·7
Calcutta		40·1	309	7 50	− 6	—	—	—	—
Mizusawa	E.	42·7	24	8 9	− 7	14 31	−13	—	—
	N.	42·7	24	8 8	− 8	14 30	−14	—	—
Colombo		43·0	280	14 8	?S	(14 8)	−40	23·2	30·3

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Melbourne	43·1	153	—	—	14 26	−23	22·6	27·6
Kodaikanal	45·9	284	25 14	?L	—	—	28·9	30·9
Simla E.	52·9	311	—	—	e 17 2	+ 7	—	—
Honolulu E.	80·2	70	—	—	—	—	e 39·8	—
Tiflis	81·0	312	—	—	e 20 56	−99	—	—
Helwan	91·0	300	e 16 15	?	23 50	−34	—	56·6
Vienna	100·8	321	e 18 7	?PR_1	—	—	e 52·8	54·8
Cape Town	102·8	234	24 50	?S	(24 50)	−92	—	—
Hamburg	103·3	326	—	—	e 25 50	−37	e 53·8	—
Strasbourg	106·3	322	(e 20 50)	?PR_1	—	—	e 20·8	—
De Bilt	106·6	326	—	—	e 26 28	−29	e 51·8	66·6
Uccle	107·5	325	e 19 2	?PR_1	e 25 8	−118	e 53·8	62·7
Besançon	107·6	319	13 37	−69	—	—	43·8	—
Dyce	108·1	331	—	—	e 28 53	+102	52·7	56·9
Edinburgh	109·2	330	—	—	e 28 50	+89	53·8	—
Paris	109·4	324	e 13 18	−97	e 27 20	− 3	56·8	60·8
Eskdalemuir	109·5	330	e 17 50	[−30]	e 28 20	+56	51·8	—
Oxford	110·1	325	—	—	—	—	53·8	78·2
Granada	118·0	311	—	—	—	—	70·8	75·3
Chicago	130·1	29	—	—	—	—	e 63·8	—
Ottawa	131·8	15	—	—	—	—	e 63·8	—
Northfield	133·7	13	—	—	—	—	e 73·8	—
La Paz	160·4	148	20 10	[+ 2]	25 34	?PR_1	29·6	—

Additional readings and notes: Manila gives also MN = +8·5m. Batavia iS = +4m.19s. Kobe MN = +7·5m. Tokyo MN = +15·6m. Calcutta PN = +8m.12s. Tiflis e = +23m.26s. De Bilt MN = +57·3m. Dyce eN = +34m.33s. Paris MN = +57·8m. Ottawa L = +69·8m. and 73·8m.

Sept. 11d. Readings also at 2h. (Azores), 3h. (Manila), 4h. (Budapest), 10h. (near Mizusawa and Tokyo), 12h. (Manila, Batavia, Colombo, Honolulu, and Apia), 13h. (Vienna, Hamburg, Strasbourg, De Bilt, Uccle, Azores, Eskdalemuir, Vera Cruz, and near Tacubaya), 14h. (near Mizusawa), 16h. (Manila and Batavia), 17h. (Granada and near Tokyo), 18h. (Manila, Batavia, and Azores), 20h. (Apia (2), Rocca di Papa, Pompeii, and Vienna), 21h. (De Bilt, Uccle, and Eskdalemuir), 22h. (Eskdalemuir).

Sept. 12d. Readings at 11h. (Victoria, Chicago, Eskdalemuir, Uccle, Hong Kong De Bilt, Honolulu, Toronto, Ottawa, and Tiflis), 14h. (Sydney and Manila), 18h. (La Paz), 21h. (near Mizusawa), 23h. (near Nagasaki). The 11h. readings suggest a repetition at 11h.35m.0s. from the epicentre 55°·0N. 167°·0E. on August 11.

Sept. 13d. Readings at 10h. (La Paz), 11h. (Tokyo), 15h. (Azores), 18h. (Hong Kong), 22h. (Azores), 23h. (Taihoku).

1922. Sept. 14d. 19h. 31m. 30s. Epicentre 25°·0N. 121°·5E.

(as on Sept. 1d.).

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

See note to Sept. 1.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	0·1	22	0 18	+16	—	—	—	—
Hokoto	2·6	231	0 40	− 1	—	—	1·1	1·2
Zi-ka-wei *	6·2	359	1 34	− 1	e 3 10	?L	(e 3·2)	—
Hong Kong	7·1	249	1 50	+ 2	—	—	3·5	4·5
Manila	10·4	183	e 2 32	− 4	—	—	5·2	10·5
Nagasaki	10·7	42	2 41	+ 1	—	—	5·1	9·2
Kobe	15·3	48	3 51	+ 8	7 25	+46	9·5	11·2
Osaka	15·5	48	3 40	− 6	(6 48)	+ 4	6·8	10·4
Nagoya	16·8	49	3 55	− 7	—	—	10·6	11·2
Tokyo	19·0	51	4 29	0	8 11	+ 9	11·2	16·9
Mizusawa E.	21·8	45	5 1	− 2	10 48	?L	(10·8)	—
Ootomari	27·5	33	4 54	−69	(11 35)	—	11·6	16·6
Calcutta E.	30·3	273	6 28	− 3	11 38	− 1	16·5	19·2
N.	30·3	273	6 36	+ 5	11 53	+14	16·8	—

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		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia		34·3	207	6 52	−15	i 13 0	+16	e 19·7	—
Dehra Dun		38·5	288	9 30	?PR_1	—	—	—	—
Simla	E.	39·2	290	7 24	−24	—	—	21·1	22·3
	N.	39·2	290	9 30	?PR_1	—	—	20·6	—
Colombo		43·6	254	8 24	+ 1	18 24	?SR_1	—	33·7
Kodaikanal		44·2	260	9 48	+81	—	—	19·0	30·3
Bombay		45·2	273	e 9 16	+42	—	—	25·3	28·1
Tiflis		64·0	307	e 11 1	+23	e 19 33	+20	34·5	41·6
Melbourne		66·6	160	11 54	+59	e 20 0	+15	32·1	44·5
Honolulu	N.	72·9	75	i 21 10	?S	(i 21 10)	+ 9	35·8	—
Upsala		75·1	330	12 1	+11	21 40	+13	e 39·7	46·8
Lemberg		75·6	319	—	—	e 21 54	+21	e 27·0	49·7
Konigsberg		75·6	325	12 4	+11	21 43	+10	e 37·0	42·5
Sitka		75·9	34	—	—	—	—	e 43·4	46·8
Helwan		77·9	297	12 20	+14	i 22 11	+12	—	49·2
Budapest		79·6	319	e 12 27	+10	e 22 34	+15	e 44·5	—
Belgrade		79·9	315	e 14 7	+109	e 26 57	?SR_1	e 44·0	50·1
Vienna		80·8	320	e 12 25	+ 1	i 22 43	+10	e 39·0	48·6
Hamburg		81·8	327	e 12 28	− 1	e 22 51	+ 7	e 40·5	45·5
Innsbruck		84·2	321	e 12 48	+ 5	—	—	e 46·5	—
Padova		84·9	319	—	—	23 24	+ 6	—	52·4
De Bilt		85·0	327	—	—	23 16	− 3	41·5	48·1
Dyce	N.	85·1	334	—	—	i 23 28	+ 8	42·3	47·6
Strasbourg		85·6	323	e 13 0	+ 9	23 33	+ 7	e 41·5	48·7
Zurich		85·8	321	e 12 54	+ 2	23 32	+ 4	—	—
Florence		86·1	319	23 0	?S	(23 0)	−31	40·8	48·5
Uccle		86·1	326	e 12 57	+ 3	e 23 33	+ 2	e 41·5	48·4
Rocca di Papa	N.	86·3	315	e 10 42	−133	17 36	?PR_1	e 44·6	56·4
Edinburgh		86·4	333	—	—	e 23 37	+ 3	43·5	57·2
Victoria		86·6	37	22 33	?S	28 57	?SR_1	—	51·3
Eskdalemuir		86·8	333	e 13 0	+ 2	23 38	− 1	41·5	47·8
Besançon		87·4	323	—	—	—	—	47·5	—
Stonyhurst		87·5	330	e 23 30	?S	(e 23 30)	−17	48·0	51·8
Moncalieri		87·6	320	i 13 16	+13	i 23 48	0	31·5	55·3
Bidston		88·0	330	21 50	?	24 55	+63	—	59·3
Kew		88·0	329	—	—	—	—	—	51·5
Oxford		88·3	329	i 13 8	+ 1	i 23 53	− 2	44·0	56·9
Paris		88·3	325	—	—	—	—	30·5	58·5
Marseilles		89·9	320	e 16 30	?PR_1	—	—	44·5	47·5
Barcelona		92·9	320	e 24 47	?S	(e 24 47)	+ 3	e 40·2	52·5
Tortosa	N.	94·3	321	—	—	—	—	e 20·5	62·0
Algiers		95·2	316	14 23	+39	e 24 55	−13	e 42·5	62·5
Granada		99·1	319	—	—	—	—	49·5	55·4
Coimbra	E.	99·8	325	e 9 50	?	21 50	?	47·8	56·0
	N.	99·8	325	e 9 30	?	22 50	−184	48·5	56·3
Rio Tinto		100·5	321	31 30	?	—	—	—	68·5
San Fernando		101·1	320	43 18	?L	—	—	(43·3)	59·6
Ottawa	E.	107·9	13	e 16 54	?	e 22 6	?	41·8	—
Chicago		108·0	22	16 0	+72	—	—	48·5	—
Toronto		108·7	15	—	—	e 23 42	?	64·9	—
Ann Arbor		108·8	20	—	—	—	—	59·4	—
Ithaca		110·5	14	—	—	—	—	54·5	—
Georgetown		113·8	15	e 16 30	+75	25 51	−129	58·0	—
Washington		113·8	15	—	—	(e 35 30)	?SR_1	63·5	—
Cape Town		113·9	242	—	—	—	—	—	66·5
Merida		125·0	36	—	—	—	—	86·1	86·6
La Paz		167·7	49	20 17	[+ 3]	e 34 24	?	69·2	87·9

Additional readings: Manila gives also MN = +8·9m. Kobe MN = +10·9m. Osaka MN = +10·8m. Tokyo iPR_1N = +4m.55s., MN = +14·6m. Mizusawa PN = +5m.2s. Batavia i = +8m.28s. and +12m.19s. Tiflis e = +11m.17s., 24m.0s., +27m.9s., and +31m.22s., MN = +39·9m. Ootomari MN = +16·2m. Honolulu eN = +29m.40s. Upsala MN = +47·0m. Konigsberg MZ = +47·5m. Sitka MN = +47·3m. Budapest readings all increased by 4m. Belgrade PR_1N = +22m.32s., eLN = +43·2m., LE = +45·9m., LN = +46·1m. Vienna iPZ = +12m.33s., iPR_1 = +16m.5s. Hamburg SR_2 = +32m.12s., MZ = +53·5m. De Bilt SR_1 = +29m.12s., MN = +48·0m. Dyce LN = +32·9m. Strasbourg SR_1? = +29m.30s.? eL = +44·5m., MN = +49·2m. Zurich i = +26m.3s. Uccle SR_1 = +29m.30s., MN = +47·9m. Rocca di Papa ePE = +10m.54s., ePZ = +12m.48s. Eskdalemuir SR_1 = +29m.30s., SR_2 = +33m.0s., MN = +47·6m. Paris MN = +48·5m. Marseilles L = +42·5m. Algiers PR_1 = +18m.4s. San Fernando MN = +67·8m. Ottawa eLE = +29·5m. and 9 other L's. Toronto eL = +72·3m. Ann Arbor eL = +48·5m., L = +62·9m. Ithaca L = +57·5m. Georgetown eLN = +43·9m., LN = +59·0m. Washington readings given as eL and L.

Sept. 14d. Readings also at 6h. (Azores and near Manila), 17h. (Azores), 18h. (near Merida), 19h. (Taihoku (2), Stonyhurst, and Budapest), 20h., 21h., and 22h. (near Taihoku).

Sept. 15d. 7h. 13m. 30s. Epicentre 45°·0N. 135°·0E. (as on 1921 May 4d.).

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.
Mizusawa	E.	7·4	220	1 55	+ 3	3 16	− 5	—	—
Tokyo		10·0	157	e 4 27	?S	(e 4 27)	− 2	(e 6·2)	6·6
Hamburg		70·9	329	—	—	—	—	e 44·5	—
Vienna	Z.	72·4	323	11 43	+11	—	—	—	—
De Bilt		73·8	330	—	—	e 44 30	?L	e 50·5	—
Uccle		75·1	330	—	—	—	—	e 43·5	—

De Bilt gives also eLN = +47·5m.

Sept. 15d. 16h. 11m. 10s. Epicentre 39°·0N. 0°·0.

A = +·777, B = 000, C = +·629.

	Δ	P.	O−C.	S.	O−C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
Alicante	0·8	−0 8	−20	—	—	—	—
Tortosa	1·9	0 27	− 2	—	—	0·9	1·2
Almeria	2·8	1 22	?L	—	—	(1·4)	—
Barcelona	3·0	0 52	+ 5	—	—	—	—
Toledo	3·2	0 41	− 9	—	—	—	—
Granada	3·4	0 54	+ 1	1 34	0	1·7	1·8
Malaga	4·2	1 10	+ 5	—	—	—	—

No additional readings.

Sept. 15d. Readings also at 0h. and 1h. (Taihoku), 2h. and 4h. (Taihoku and Zi-ka-wei), 13h. (Taihoku), 17h. (near Tokyo), 19h. (Colombo), 20h. (Taihoku (2) and Zi-ka-wei), 21h. (Zi-ka-wei and Athens).

Sept. 16d. 22h. 44m. 36s. Epicentre 25°·0N. 121°·5E. (as on Sept. 14d.).

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

See Note to Sept. 1.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		0·1	22	−0 3	− 5	—	—	0·3	—
Hokoto		2·6	231	0 51	+10	—	—	1·3	1·4
Zi-ka-wei		6·2	359	e 1 24	−11	e 3 0	+11	—	—
Manila		10·4	183	e 2 28	− 8	(4 53)	+13	4·9	7·2
Nagasaki		10·7	42	2 44	+ 4	—	—	6·4	—
Kobe		15·3	48	3 26	−17	—	—	7·3	12·0
Osaka		15·5	48	3 46	0	(6 55)	+11	6·9	13·4
Tokyo		19·0	51	e 5 3	+34	8 23	+21	11·8	15·1
Ootomari		27·5	33	5 47	−16	—	—	15·4	19·7
Calcutta	E.	30·3	273	9 40	?	13 45	?	17·8	19·8
Batavia		34·3	207	6 29	−38	—	—	21·4	—
Simla		39·2	290	13 24	?S	(13 24)	−30	22·0	—
Colombo		43·6	254	8 24	+ 1	17 54	?SR_1	28·2	30·4
Kodaikanal		44·2	260	14 6	?S	(14 6)	−59	27·5	36·2
Bombay		45·2	273	e 11 26	?PR_1	(18 41)	?SR_1	18·7	28·2
Tiflis		64·0	307	e 15 12	?PR_1	19 48	+35	e 35·8	42·7
Honolulu	E.	72·9	75	20 59	?S	(20 59)	− 2	36·8	47·9
Konigsberg	E.	75·6	325	—	—	—	—	e 41·4	47·4
	N.	75·6	325	—	—	—	—	e 40·5	42·4
Helwan		77·9	297	e 12 14	+ 8	22 8	+ 9	—	54·0
Bergen		80·1	334	—	—	—	—	99·4	—
Vienna		80·8	320	e 12 21	− 3	e 22 48	+15	e 42·2	53·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hamburg		81·8	327	—	—	—	—	e 40·4	50·4
De Bilt		85·0	327	—	—	—	—	e 40·4	49·1
Strasbourg		85·6	323	—	—	e 24 24	+58	40·4	—
Uccle		86·1	326	e 13 0	+ 6	—	—	e 41·4	47·4
Florence		86·1	319	—	—	—	—	—	110·4
Rocca di Papa		86·3	315	e 17 48	?PR_1	e 23 30	− 3	e 46·4	55·1
Edinburgh		86·4	333	—	—	—	—	43·4	48·3
Victoria		86·6	37	—	—	—	—	50·9	—
Eskdalemuir		86·8	333	—	—	e 23 58	+19	39·4	48·2
Besançon		87·4	323	—	—	—	—	48·4	—
Stonyhurst		87·5	330	e 28 24	?SR_1	34 54	?	46·4	51·4
Moncalieri		87·6	320	e 11 37	−86	23 25	−23	e 37·9	50·9
Kew		88·0	329	—	—	—	—	—	54·4
Bidston		88·0	330	—	—	35 29	?	—	51·6
Oxford		88·3	329	—	—	—	—	41·4	49·6
Paris		88·3	325	—	—	—	—	e 48·4	49·4
Barcelona		92·9	320	—	—	—	—	e 50·4	53·8
Berkeley		93·3	45	—	—	—	—	e 68·5	—
Tortosa	N.	94·3	321	e 41 24?	—	—	—	e 48·4	64·9
Algiers		95·2	316	—	—	—	—	e 54·4	62·4
Granada		99·1	319	—	—	—	—	54·9	57·2
Coimbra	E.	99·8	325	e 23 54	?S	(23 54)	−120	49·4	56·6
	N.	99·8	325	—	—	—	—	48·4	59·1
Rio Tinto		100·5	321	60 24	?L	—	—	(60·4)	63·4
San Fernando		101·1	320	54 36?	?L	—	—	(54·6?)	60·9
Ottawa		107·9	13	—	—	29 24	+135	56·4	—
Chicago		108·0	22	—	—	e 42 52	?	54·1	—
Toronto		108·7	15	—	—	—	—	e 63·6	65·9
Ann Arbor		108·8	20	—	—	—	—	56·4	—
Ithaca		110·5	14	—	—	—	—	60·4	—
Washington		113·8	15	—	—	—	—	e 65·4	—
La Paz		167·7	49	20 16 [+ 2]	—	—	—	—	—

Additional readings: Manila gives also MN = +7·4m. Kobe MN = +10·2m. Osaka MN = +12·8m. Tokyo MN = +14·4m. Batavia i = +8m.57s. Simla PN = +11m.30s. Tiflis e = +28m.48s. Honolulu eE = +32m.49s. eN = +30m.26s., LE = +45·4m., MN = +32·2m. Hamburg MN = +45·4m., MZ = +53·4m. De Bilt MN = +49·2m. Victoria L = +59·5m. Eskdalemuir eSR_1 = +29m.48s., MN = +48·1m. Paris MN = +51·4m. Barcelona MN = +53·7m. Berkeley eZ? = +50m.12s., eE = +60m.24s. Coimbra S = +33m.26s. San Fernando MN = +63·9m. Ottawa e? = +40m.24s., eL = +48·4m. Toronto eL = +74·2m.

Sept. 16d. Readings also at 0h. (Taihoku), 3h. (Taihoku and Zi-ka-wei), 4h. (Taihoku, Zi-ka-wei, and Granada), 6h. (Rocca di Papa), 12h. (Azores), 16h. (Algiers), 18h. (near Taihoku), 19h. (near Tacubaya), 20h. (Manila), 22h. (Coimbra), 23h. (near Taihoku and near Tacubaya).

1922. Sept. 17d. { **7h. 22m. 36s.** (I) / **7h. 53m. 6s.** (II) / **9h. 59m. 18s.** (III) } Epicentre **25°·0N. 121°·5E.** (as on Sept. 16d.).

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

See Note to September 1.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Taihoku	0·1	22	0 2	0	—	—	0·3	—
II		0·1	22	0 5	+ 3	—	—	—	—
III		0·1	22	0 18	+16	—	—	→	—
I	Hokoto	2·6	231	0 45	+ 4	(1 9)	− 3	1·2	2·1
II		2·6	231	0 3	−38	—	—	0·4	0·8
III		2·6	231	0 38	− 3	(1 4)	− 8	1·1	1·3
I	Zi-ka-wei	6·2	359	e 2 2	+27	e 3 20	?L	(e 3·3)	5·1
II		6·2	359	e 1 32	− 3	e 2 48	− 1	—	4·6
III		6·2	359	e 1 27	− 8	e 2 55	+ 6	—	4·7
II	Hong Kong	7·1	249	3 34	?L	—	—	(3·6)	4·2
III		7·1	249	—	—	—	—	—	5·0

Continued on next page.

			Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
			°	°	m. s.	s.	m. s.	s.	m.	m.
I	Manila		10·4	183	e 2 59	+23	—	—	5·3	—
II			10·4	183	e 3 44	+68	—	—	7·8	—
III			10·4	183	e 2 17	−19	—	—	5·6	6·0
I	Nagasaki		10·7	42	3 4	+24	—	—	6·5	—
III			10·7	42	2 45	+ 5	—	—	6·4	10·4
I	Kobe		15·3	48	—	—	—	—	e 7·1	10·8
II			15·3	48	—	—	—	—	e 7·2	10·6
III			15·3	48	—	—	5 36	−63	7·5	14·1
I	Osaka		15·5	48	2 54	−52	(6 8)	−36	6·1	15·1
II			15·5	48	3 38	− 8	—	—	7·0	14·6
III			15·5	48	3 51	+ 5	—	—	7·0	13·0
I	Tokyo		19·0	51	e 5 12	+43	e 8 48	+46	e 12·0	15·4
I	Calcutta	E.	30·3	273	5 42	−49	11 8	−31	17·2	—
III		E.	30·3	273	5 16	−75	10 37	−62	17·3	—
I	Batavia		34·3	207	e 6 58	− 9	—	—	e 20·4	—
II			34·3	207	e 6 32	−35	—	—	—	—
III			34·3	207	e 6 45	+22	—	—	e 55·8	—
I	Simla	N.	39·2	290	—	—	—	—	e 20·5	—
III		N.	39·2	290	—	—	—	—	e 19·8	—
I	Colombo		43·6	254	8 42	+19	17 12	?SR_1	26·7	29·7
III			43·6	254	10 0	+97	18 18	?SR_1	—	—
I	Kodaikanal		44·2	260	17 42	?SR_1	—	—	—	—
III			44·2	260	16 48	?	—	—	23·9	30·2
I	Bombay		45·2	273	e 18 53	?SR_1	—	—	—	—
III			45·2	273	e 15 5	?S	(e 15 5)	−13	—	—
I	Tiflis		64·0	307	e 7 12	?	e 12 48	?PR_1	32·4	45·9
III	Sydney		65·4	153	16 18	?	—	—	38·2	43·3
III	Melbourne		66·6	160	—	—	—	—	25·4	44·1
I	Honolulu	E.	72·9	75	21 22	?S	(21 22)	+21	34·8	38·1
I		N.	72·9	75	—	—	—	—	e 35·4	37·9
III		E.	72·9	75	21 1	?S	(21 1)	0	e 36·7	43·4
I	Konigsberg		75·6	325	—	—	—	—	e 43·3	48·4
III			75·6	325	—	—	—	—	e 43·9	48·7
I	Helwan		77·9	297	e 12 31	+25	22 7	+ 8	—	54·4
III			77·9	297	12 7	+ 1	22 0	+ 1	—	54·2
II	Vienna		80·8	320	e 12 7	−17	—	—	—	23·6
III			80·8	320	i 12 26	+2	22 36	+ 3	—	54·2
I	Hamburg		81·8	327	—	—	—	—	e 40·4	53·4
II			81·8	327	—	—	—	—	—	52·9
III			81·8	327	—	—	—	—	e 41·7	52·7
I	De Bilt	E.	85·0	327	—	—	23 36	+17	e 44·4	54·9
I		N.	85·0	327	—	—	—	—	e 42·4	56·0
II		E.	85·0	327	—	—	—	—	e 43·9	54·4
II		N.	85·0	327	—	—	—	—	e 42·9	55·5
III			85·0	327	—	—	23 20	+ 1	e 42·7	54·6
I	Dyce	N.	85·1	334	—	—	—	—	46·4	55·4
III		N.	85·1	334	—	—	—	—	47·7	55·7
I	Strasbourg		85·6	323	—	—	—	—	48·4	—
III			85·6	323	e 12 47	− 4	e 23 29	+ 3	48·7	55·7
III	Pompeii		85·6	313	e 15 14	?	—	—	—	—
I	Florence		86·1	319	—	—	—	—	—	55·4
III			86·1	319	—	—	—	—	—	67·7
I	Uccle		86·1	326	—	—	e 23 48	+17	e 42·4	57·1
III			86·1	326	e 18 42	?PR_1	—	—	e 43·7	56·7
I	Rocca di Papa		86·3	315	e 14 18	+83	—	—	e 43·7	59·2
III			86·3	315	12 54	− 1	e 23 24	− 9	e 53·5	71·0
I	Edinburgh		86·4	333	—	—	—	—	48·4	56·4
III			86·4	333	—	—	—	—	47·7	56·2
I	Victoria		86·6	37	—	—	—	—	52·2	—
III			86·6	37	—	—	—	—	44·9	58·8
I	Eskdalemuir		86·8	333	—	—	e 23 24	−15	44·4	56·5
II			86·8	333	—	—	—	—	44·9	—
III			86·8	333	—	—	e 23 17	−22	43·7	55·5
III	Besançon		87·4	323	e 13 6?	+ 5	—	—	51·7	—
I	Stonyhurst		87·5	330	e 23 54	?S	(e 23 54)	+ 7	—	58·4
I	Moncalieri		87·6	320	e 23 24	?S	(e 23 24)	−24	49·4	56·6
III			87·6	320	(12 55)	− 8	12 55	?P	22·7	57·7
I	Kew		88·0	329	—	—	—	—	—	59·4
III			88·0	329	—	—	—	—	—	57·7
I	Bidston		88·0	330	—	—	49 12?	?L	(49·2?)	59·3
III			88·0	330	—	—	—	—	—	39·0
III	Paris		88·3	325	—	—	e 17 14	?PR_1	47·7	55·7
I	Oxford		88·3	329	—	—	23 49	− 6	46·8	57·2
III			88·3	329	—	—	23 34	−21	46·7	58·1
I	Barcelona		92·9	320	—	—	—	—	e 52·4	62·4
III			92·9	320	—	—	—	—	e 52·6	60·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Tortosa	N.	94·3	321	—	—	—	—	e 50·4	—
III	N.	94·3	321	—	—	—	—	e 51·7	56·6
I Algiers		95·2	316	—	—	—	—	e 56·4	64·4
III		95·2	316	—	—	—	—	e 56·7	63·7
III Granada		99·1	319	—	—	—	—	54·7	47·2
I Coimbra	E.	99·8	325	e 9 33	?	24 39	−75	48·4	65·9
I	N.	99·8	325	14 51	+41	—	—	50·4	65·6
III		99·8	325	10 35	?	24 21	−93	e 50·7	66·9
I Rio Tinto		100·5	321	60 24	?L	—	—	(60·4)	68·4
I San Fernando		101·1	320	—	—	—	—	—	66·2
III		101·1	320	56 42	?L	—	—	(56·7)	65·2
I Ottawa		107·9	13	—	—	e 49 24	?L	57·4	—
III		107·9	13	—	—	e 26 24	−45	e 56·7	—
I Chicago		108·0	22	—	—	—	—	e 51·4	—
III		108·0	22	27 55	?S	(27 55)	+45	51·7	—
I Toronto		108·7	15	—	—	—	—	63·8	—
III		108·7	15	—	—	—	—	63·5	73·6
I Ann Arbor		108·8	20	—	—	e 49 24	?L	e 57·4	—
III		108·8	20	—	—	—	—	59·7	—
III Ithaca		110·5	14	—	—	—	—	64·7	—
I Washington		113·8	15	—	—	—	—	e 72·4	—
I La Paz		167·7	49	89 7	?L	—	—	(89·1)	—
III		167·7	49	19 25	[−49]	—	—	—	—

Additional readings and notes: Zi-ka-wei I gives also MN = +4·4m., II MN = +3·8m. Kobe readings I, II, and III diminished by 30m. I MN = +11·1m. II MN = +9·4m., III MN = +14·7m. Osaka I MN = +14·7m., II MN = +13·6m., III MN = +13·6m. Tokyo I MN = +15·3m. Batavia I i = +8m.24s. Tiflis I e = +20m.24s., MN = +41·7m. Melbourne III e = 9h.52m.36s. Honolulu III SR_1N = +31m.0s., LN = +35·0m., MN = +46·3m. Königsberg I eN = +40m.39s., III eN = +39m.42s. Vienna II i = +15m.45s., III i = +22m.45s., PS = +23m.19s. De Bilt III MN = +55·8m. Strasbourg III MN = +57·3m. Strasbourg I L increased by 1h. Rocca di Papa III PV = +13m.6s., iP = +13m.54s. Victoria I L = +60·7m. Eskdalemuir III e = +29m.42s. and +33m.42s., MN = +56·4m. Moncalieri I S = +34m.35s., III P? = 9h.58m.22s. Bidston III P = 9h.52m.20s., S = 9h.54m.20s. Coimbra III eP? = +15m.31s., MN = +65·8m. San Fernando I MN = +67·7m., III MN = +67·5m. Ottawa III e = +28m.12s. and +41m.42s., eL = +44·7m. Toronto I L = +67·0m. and +96·1m., III L = +71·6m., eL = +81·6m. Ithaca III L = +72·7m.

Sept. 17d. Readings also at 1h. (Taihoku (2), Hokoto, and Zi-ka-wei (2)), 2h. (De Bilt, Uccle, and near Zurich), 3h. (Vienna and Azores), 4h. (Lick), 5h. (Zi-ka-wei and near Hokoto and Taihoku), 6h. (near Tokyo), 7h. (near Taihoku), 9h. (Nagoya, Zi-ka-wei (2), Pilar, Tokyo, Taihoku (2), and near Berkeley), 10h. (Taihoku (2) and Cipolletti), 11h. (Zi-ka-wei (2), Taihoku, Cipolletti, Budapest, and near Hokoto), 12h. (Strasbourg, Taihoku (2), Zi-ka-wei, and near Hokoto), 17h. (La Paz), 21h. (near Taihoku), 22h. (De Bilt, Zi-ka-wei, Hong Kong, Eskdalemuir, Kew, and near Hokoto), 23h. (Dyce).

Sept. 18d. 6h. 20m. 0s. Epicentre 25°·0N. 121°·5E. (as on 17d.).

See Note to Sept. 1.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		0·1	22	0 0	− 2	—	—	0·2	0·3
Zi-ka-wei		6·2	359	e 1 38	+ 3	e 3 2	+13	—	5·3
Hong Kong		7·1	249	2 30	+42	—	—	—	4·5
Manila		10·4	183	e 2 4	−32	—	—	—	—
Nagasaki		10·7	42	2 41	+ 1	—	—	—	—
Colombo		43·6	254	23 12	?L	—	—	(23·2)	—
Hamburg		81·8	327	—	—	—	—	e 43·0	55·0
De Bilt	E.	85·0	327	—	—	—	—	e 46·0	47·8
	N.	85·0	327	—	—	—	—	e 45·0	55·7
Strasbourg		85·6	323	—	—	—	—	e 50·5	—
Uccle		86·1	326	—	—	—	—	e 45·0	—
Rocca di Papa		86·3	315	—	—	—	—	e 49·2	61·8
Edinburgh		86·4	333	—	—	—	—	e 49·0	—
Eskdalemuir		86·8	333	—	—	e 23 30	− 9	e 43·5	56·0
Kew		88·0	329	—	—	—	—	—	58·0
Bidston		88·0	330	—	—	—	—	—	59·0
Paris		88·3	325	—	—	e 47 0	?L	55·0	57·0
Oxford		88·3	329	—	—	—	—	—	57·9

Additional readings: Zi-ka-wei gives also MN = +5·2m. Eskdalemuir eE = +29m.30s.

Sept. 18d. Readings also at 0h. (near Tokyo), 2h. (Taihoku), 9h. (Tiflis and Azores), 10h. (near Taihoku), 12h. (Chicago, Honolulu, and near Berkeley), 16h. (Innsbruck), 17h. (Azores), 21h. (near Tokyo).

Sept. 19d. 3h. 16m. 20s. (I) } Epicentre 18°·0S. 73°·0W. (as on 1913 Aug. 6d.).
23h. 50m. 0s. (II) }

$A = +\cdot278$, $B = -\cdot910$, $C = -\cdot309$; $D = -\cdot956$, $E = -\cdot292$; $G = -\cdot090$, $H = +\cdot296$, $K = -\cdot951$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I La Paz		4·9	70	i 1 23	+ 7	i 2 27	+13	2·8	3·2
II		4·9	70	i 1 22	+ 6	i 2 25	+11	2·7	4·1
I La Quiaca	E.	8·0	122	1 10	−51	(3 54)	+17	3·6	4·6
II	E.	8·0	122	—	—	—	—	4·5	5·3
I Andalgala	E.	11·4	149	0 4	?	—	—	0·5	1·2
I	N.	11·4	149	−0 2	?	—	—	0·5	1·3
II	E.	11·4	149	−0 18	?	—	—	0·4	1·5
II	N.	11·4	149	—	—	—	—	0·5	1·6
I Mendoza		15·5	165	7 34	?L	—	—	9·1	10·1
II		15·5	165	8 18	?L	—	—	8·8	10·1
I Pilar	E.	16·0	151	6 4	?	(6 58)	+ 3	7·0	7·3
I	N.	16·0	151	5 58	?	(7 4)	+ 9	7·1	7·7
II	E.	16·0	151	7 6	?S	(7 6)	+11	7·6	8·8
II	N.	16·0	151	7 6	?S	(7 6)	+11	7·8	10·7
II Chacareta	E.	21·1	145	8 18	?S	(8 18)	−28	14·7	24·6
II	N.	21·1	145	8 12	?S	(8 12)	−34	14·6	24·5
I Cipolletti		21·4	169	10 58	?L	—	—	13·1	14·2
II		21·4	169	15 18	?L	—	—	16·0	21·0
I Uccle		96·2	38	—	—	—	—	—	51·7
I De Bilt	E.	97·1	37	—	—	—	—	e 52·7	—
I Strasbourg		97·4	41	—	—	—	—	e 29·7	—
II		97·4	41	—	—	—	—	e 68·0	—

Additional readings: De Bilt I gives also eLN = +53·7m.

Sept. 19d. Readings also at 0h. (Port au Prince), 1h. (near La Paz), 2h. (near La Paz (2) and Taihoku), 3h. (La Paz and near Taihoku), 4h. (La Paz), 6h. (near Tacubaya), 7h. (La Paz), 8h. (Vienna), 9h. (La Paz), 10h. (near Tokyo and near Tacubaya), 11h. and 13h. (near Zurich), 15h. (La Paz), 16h. (Algiers), 17h. (La Paz and Zurich), 18h. (near Batavia), 21h. (near Batavia and near La Paz).

Sept. 20d. 12h. 32m. 8s. Epicentre 43°·8N. 11°·2E. (as on 1922 Aug. 2d.).

$A = +\cdot708$, $B = +\cdot140$, $C = +\cdot692$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	0·0	—	0 18	+18	—	—	—	0·4
Padova	1·7	17	0 27	+ 1	0 44	− 4	—	—
Rocca di Papa	2·3	152	—	—	—	—	e 1·3	2·0
Innsbruck	3·5	2	—	—	e 1 23	−14	—	—
Zurich	4·0	332	i 0 57	− 5	i 1 50	0	—	—
Strasbourg	5·3	334	e 2 7	?S	(e 2 7)	−18	e 2·9	—

Innsbruck readings decreased by 1h. Zurich gives also i = +1m.6s.

Sept. 20d. Readings also at 3h. (La Paz and near Vera Cruz), 5h. (Batavia), 8h. (La Paz), 9h. (Zi-ka-wei), 13h. (Taihoku), 16h. (near Tokyo and near Tacubaya), 17h., 18h. (2), and 19h. (La Paz), 21h. (Zi-ka-wei, Taihoku, and La Paz), 22h. (Manila), 23h. (near Granada).

Sept. 21d. Readings at 0h. (Azores), 1h. (La Paz), 3h. and 4h. (La Paz), 6h. (Taihoku), 10h. (Batavia), 11h. (Algiers), 15h. (near Manila), 16h. (near Taihoku), 17h. (Azores), 20h. (Azores, Malaga, and near Granada), 21h. (near Tokyo), 22h. (Granada, near Taihoku, Hong Kong, and Zi-ka-wei), 23h. (Granada and Azores).

Sept. 22d. 18h. 13m. 45s. Epicentre 34°·5N. 25°·0E. (as on 1922 Mar. 8d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3·6	344	e 1 0	+ 4	1 38	− 1	e 1·8	2·3
Pompeii	10·3	310	e 3 40	+66	—	—	—	—
Rocca di Papa	12·1	310	e 3 3	+ 3	—	—	—	8·4
Strasbourg	19·0	323	e 3 28	−61	—	—	e 12·8	—
Uccle	22·1	324	e 5 3	− 3	—	—	e 12·0	—
De Bilt	22·6	327	—	—	e 9 15	− 2	—	13·4
Granada	23·2	285	i 5 12	− 7	—	—	—	—
Eskdalemuir	28·5	326	—	—	—	—	e 14·2	—

Additional readings : Athens gives also ePE = +1m.6s., MN = +2·7m. Rocca di Papa ePN = +3m.33s. Granada i = +5m.34s. and +5m.40s.

Sept. 22d. 21h. 25m. 30s. Epicentre 27°·0N. 42°·0W.

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

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Coimbra	30·7	56	e 6 30	− 5	e 11 48	+ 2	14·8	—
Tortosa N.	37·5	58	7 30	− 4	13 30	− 1	—	18·2
Algiers	39·1	65	e 7 51	+ 4	e 14 0	+ 7	21·5	—
Eskdalemuir	39·8	34	—	—	e 13 57	− 6	e 16·9	—
Chicago	39·9	304	12 30	?S	(12 30)	−95	18·5	—
Uccle	42·3	44	—	—	e 14 37	− 2	e 20·5	—
De Bilt	43·0	41	—	—	e 14 50	+ 2	e 20·5	21·6
Strasbourg	43·8	47	e 8 30	+ 6	e 15 3	+ 4	e 22·5	—
Rocca di Papa	46·7	58	e 8 54	+ 9	(e 14 36)	−61	e 14·6	15·1
La Paz	50·4	214	8 22	−47	—	—	27·9	—

Additional readings and notes : Coimbra gives also eLN = +13·5m. De Bilt eLN = +19·5m.

The above determination is made on the hypothesis that the focus is of normal depth, and that the La Paz and Chicago readings are in some way erroneous. A determination in which these assumptions are not made is as follows :—

Sept. 22d. 21h. 25m. 30s. Epicentre 25°·2N. 46°·6W.

A = +·622, B = −·657, C = +·426 ; D = −·727, E = −·687 ;
G = +·293, H = −·309, K = −·905.

A depth of focus 0·045 is assumed in order to reconcile the La Paz observation with those in Europe.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Coimbra	−3·3	35·1	54	e 6 30	−15	e 11 48	−17	14·8	—
Chicago	−3·4	37·1	307	12 30	?S	(12 30)	− 6	18·5	—
Tortosa N.	−3·7	41·9	55	7 30	−10	13 30	−11	—	18·2
Eskdalemuir	−3·9	43·5	34	—	—	e 13 57	− 3	e 16·9	—
Algiers	−3·9	43·6	61	e 7 51	− 1	e 14 0	− 2	21·5	—
Uccle	−4·1	46·3	42	—	—	e 14 37	− 1	e 20·5	—
La Paz	−4·2	46·7	210	8 22	+ 7	—	—	27·9	—
De Bilt	−4·2	47·1	41	—	—	e 14 50	+ 3	e 20·5	21·6
Strasbourg	−4·2	48·0	46	e 8 30	+ 6	e 15 3	+ 4	e 22·5	—
Rocca di Papa	−4·5	51·0	55	e 8 54	+10	(e 14 36)	−59	e 14·6	15·1

Additional readings : Coimbra gives also eLN = +13·5m. De Bilt eLN = +19·5m.

Sept. 22d. Readings also at 1h. (Zi-ka-wei and Hong Kong), 2h. (Granada), 4h. (Azores and Manila), 5h. (Granada), 6h. and 10h. (Azores), 15h. (La Paz). 20h. (Berkeley).

Sept. 23d. 0h. 53m. 40s. Epicentre 40°·5N. 4°·0E.

A = +·758, B = +·053, C = +·649 ; D = +·070, E = −·998 ; G = +·648, H = +·045, K = −·760.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Barcelona		1·7	302	i 0 26	0	—	—	i 0·8	—
Tortosa	N.	2·6	277	0 44	+ 3	—	—	1·3	—
Marseilles		3·0	20	0 42	− 5	1 12	−11	—	—
Puy de Dôme		5·4	353	1 0	−23	—	—	—	—
Granada		6·8	243	i 3 43	?L	i 4 22	?	4·4	4·5
Besançon		6·8	12	2 41	?S	(2 41)	−24	—	—
Zurich		7·6	25	e 1 53	− 2	i 3 33	+ 7	—	—
Paris		8·4	354	—	—	—	—	e 4·3	—
Strasbourg		8·5	17	—	—	e 3 46	− 4	(e 4·1)	—
Uccle		10·3	2	e 3 14	+40	—	—	—	—
Eskdalemuir		15·6	344	—	—	—	—	7·3	—

Additional readings : Zurich gives also eV = +1m.33s. Strasbourg e? = +3m.44s., eL is given as eS?.

Sept. 23d. 6h. 37m. 10s. Epicentre 36°·5N. 140°·5E. (as on 1920 Dec. 2d.).

A = −·620, B = +·511, C = +·595.

		Δ	P.	O−C.	S.	O−C.	L.	M.
		°	m. s.	s.	m. s.	s.	m.	m.
Tokyo		1·1	i 0 16	− 1	i 0 28	− 3	—	0·5
Mizusawa	E.	2·6	0 41	0	1 14	+ 2	—	—
Nagoya		3·2	0 48	− 2	—	—	1·5	2·3
Osaka		4·5	1 1	− 9	—	—	2·2	3·2
Kobe		4·7	e 1 21	+ 8	—	—	2·4	3·0
Zi-ka-wei	Z.	16·7	e 4 10	+ 9	—	—	—	10·1

Additional readings : Mizusawa gives also SN = +1m.15s. Osaka MN = +3·1m. Kobe MN = +2·6m.

Sept. 23d. Readings also at 15h. (La Paz and Taihoku). 18h. (Rocca di Papa and near Tokyo). 21h. (Bidston and Granada), 22h. (Taihoku).

Sept. 24d. 12h. 26m. 0s. Epicentre 75°·0N. 100°·0E.

A = −·045, B = +·255, C = +·966 ; D = +·985, E = +·174 ; G = −·168, H = +·951, K = −·259.

Very doubtful.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Dyce	N.	38·5	303	i 11 15	?	i 14 10	+25	—	21·0
Hamburg		39·0	290	e 15 13	?S	(e 15 13)	+81	e 23·0	—
Edinburgh		40·0	302	—	—	i 13 54	−13	18·5	20·5
Eskdalemuir	E.	40·5	302	e 7 45	−14	—	—	12·0	19·5
	N.	40·5	302	i 11 19	?PR_1	—	—	i 17·5	22·8
De Bilt		41·5	291	—	—	e 15 0	+32	21·0	23·9
Bidston		42·2	298	—	—	14 37	− 1	—	21·0
Uccle		42·9	291	—	—	e 14 54	+ 7	e 21·0	—
Kew		43·4	297	—	—	—	—	—	22·0
Oxford		43·4	299	—	—	—	—	18·3	21·0
Strasbourg		44·2	289	e 15 21	?S	(e 15 21)	+16	e 24·0	—
Moncalieri		47·5	285	—	—	e 18 0	?SR_1	19·4	—
Rocca di Papa		49·3	280	e 9 54	+52	e 16 12	+ 2	—	—
Coimbra		55·9	300	3 54	?	11 36	?PR_1	20·2	—
Algiers		56·4	287	—	—	e 19 11	+92	e 25·0	26·5

Additional readings : Eskdalemuir gives also iE = +13m.56s. Strasbourg eS = +20m.30s. Rocca di Papa eSE = +15m.30s., eSN = +16m.0s.

Sept. 24d. Readings also at 2h. (Zi-ka-wei and near Taihoku), 7h. (Granada and near Kobe), 8h. (near Tacubaya), 14h. (La Paz (2)), 18h. (Zi-ka-wei, near Taihoku, and near Tacubaya), 19h. (Zi-ka-wei and near Taihoku), 22h. (near Tacubaya).

Sept. 25d. Readings at 5h. (near Manila), 8h. (Zi-ka-wei), 9h. (Mizusawa), 12h. (Tortosa), 13h. (Granada, Almeria, and Mala a), 14h. (Malaga (2) and near Granada), 15h. (Nagoya and near Osaka and Kobe), 23h. (near Tacubaya).

Sept. 26d. Readings at 2h. (Pompeii and Rocca di Papa), 5h. (Zi-ka-wei), 7h. (Taihoku and Zi-ka-wei), 11h. (Tiflis), 12h. (Batavia), 14h. (near Manila and near Taihoku), 19h. (Rio Tinto and near Tacubaya).

Sept. 27d. Readings at 7h. (near Taihoku), 9h. (Zi-ka-wei), 23h. (Zi-ka-wei (2) and Colombo).

Sept. 28d. 22h. 1m. 5s. Epicentre 39°·2N. 120°·5E.

$A = -\cdot393$, $B = +\cdot668$, $C = +\cdot632$; $D = +\cdot862$, $E = +\cdot508$; $G = -\cdot321$, $H = +\cdot545$, $K = -\cdot775$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Zi-ka-wei	8·0	174	e 2 1	0	e 3 37	0	—	6·4
Kobe	12·6	106	0 51	?	—	—	10·2	16·8
Taihoku	14·2	177	2 37	−52	—	—	2·8	—
Tokyo	15·7	97	—	—	6 46	− 2	—	—
Hong Kong	17·7	200	4 13	0	—	—	—	7·4
Manila	24·6	179	e 5 35	+ 1	—	—	—	—
Hamburg	69·7	324	—	—	—	—	e 45·9	47·9
De Bilt E.	72·9	325	—	—	—	—	e 45·9	51·7
N.	72·9	325	—	—	—	—	e 44·9	50·2
Edinburgh	73·6	331	—	—	—	—	48·9	54·9
Strasbourg	74·0	321	—	—	—	—	49·9	—
Eskdalemuir	74·0	331	—	—	—	—	46·9	51·0
Uccle	74·1	325	—	—	—	—	e 47·9	50·9
Stonyhurst	74·8	329	e 16 55	?PR_1	—	—	—	53·9
Florence	75·4	316	—	—	—	—	43·2	53·0
Kew	75·6	327	—	—	—	—	—	57·9
Oxford	75·9	327	—	—	—	—	48·4	58·9
Moncalieri	76·4	318	—	—	e 40 22	?L	48·6	—

Additional readings and notes: Zi-ka-wei eP has been diminished by 2m., MN = +6·2m. Kobe MN = +15·4m.

Sept. 28d. Readings also at 1h. (near Zurich), 4h. (Batavia, Zante (2), and Pompeii), 5h. (near Tokyo). 12h. (near Mizusawa), 16h. and 17h. (near La Paz), 20h. (Stonyhurst).

Sept. 29d. 18h. 44m. 35s. Epicentre 42°·5N. 89°·3E.

$A = +\cdot009$, $B = +\cdot737$, $C = +\cdot676$; $D = +1\cdot000$, $E = -\cdot012$; $G = +\cdot008$, $H = +\cdot676$, $K = -\cdot737$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Simla N.	15·0	224	e 3 37	− 2	—	—	—	—
Calcutta E.	20·0	183	4 41	0	8 24	+ 1	12·0	—
Tiflis	32·6	282	—	—	e 10 39	−99	e 15·6	18·2
Kodaikanal	33·9	202	16 13	?L	—	—	(16·2)	—
Colombo	36·6	197	12 55	?S	(12 55)	−23	—	21·4
Lemberg	44·3	303	—	—	e 14 13	−53	e 20·7	22·5
Konigsberg	45·0	312	—	—	—	—	i 16·9	22·7

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Vienna	49·6	305	e 8 4	−60	—	—	i 24·5	27·9
Bergen	51·3	322	—	—	—	—	25·6	—
Hamburg	51·3	312	—	—	—	—	i 24·8	28·9
De Bilt E.	54·6	311	—	—	—	—	e 26·4	32·2
N.	54·6	311	—	—	—	—	e 25·4	28·4
Strasbourg	54·7	309	—	—	e 26 25	?L	(e 26·4)	—
Rocca di Papa	54·7	298	i 18 1	?S	(i 18 1)	+44	26·1	30·4
Uccle	55·6	310	—	—	—	—	e 25·4	—
Moncalieri	56·4	303	e 13 23	?PR_1	19 47	+128	28·9	—
Edinburgh	57·2	319	—	—	—	—	28·4	29·4
Eskdalemuir	57·5	319	—	—	—	—	25·4	29·4
Kew	57·9	313	—	—	—	—	—	33·4
Oxford	58·3	313	—	—	—	—	28·3	33·4
Bidston	58·4	315	—	—	25 27	?L	(25·4)	35·1
Coimbra	68·9	306	—	—	32 5	?	35·9	—
Ottawa E.	91·1	350	—	—	—	—	e 44·4	—
Chicago	95·6	357	45 20	?L	—	—	e 51·4	—

Additional readings: Calcutta gives also SN = +8m.22s. Tiflis e = +14m.10s. [e] = +18m.30s., [L] = +23·5m. Vienna eN = +10m.16s., iE = +21m.32s., and +22m.33s. Bergen e = +21m.45s. Hamburg e = +19m.25s., MN = +27·7m., MZ = +29·4m. De Bilt eE = +20m.1s. Strasbourg e = +19m.36s. Uccle e = +20m.13s. Eskdalemuir e = +21m.0s., MN = +60·5m. Coimbra e = +27m.5s. Ottawa LE = +48·9m.

Sept. 29d. 21h. 29m. 0s. Epicentre 15°·5N. 101°·2W. (as on 1922 April 20d.).

A = −·187, B = −·945, C = +·267; D = −·981, E = +·194; G = −·052, H = −·262, K = −·964.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Colima	3·6	318	0 31	−25	—	—	1·5	1·7
Tacubaya	4·3	25	1 16	+ 9	(1 46)	−12	1·8	1·9
Oaxaca	4·5	69	1 39	+29	—	—	2·4	2·8
Puebla	4·5	38	1 40	+30	—	—	2·2	2·5
Vera Cruz	6·1	52	2 12	?S	(2 12)	−34	3·3	3·4
Mazatlan	9·1	329	3 8	+50	—	—	4·7	4·9
Merida	12·3	62	3 21	+18	—	—	5·3	6·0
Tucson	18·9	334	—	—	—	—	i 10·1	11·0
Denver	24·4	353	—	—	—	—	11·0	—
Chicago	28·8	21	6 12	− 4	10 50	−23	—	—
Berkeley	29·1	324	—	—	e 12 21	+62	e 14·9	—
Ann Arbor	30·7	27	—	—	—	—	i 13·0	—
Georgetown	31·6	38	—	—	e 11 48	−13	e 28·0	—
Washington	31·6	38	5 43	−60	12 42	+41	—	—
Toronto	33·7	30	—	—	—	—	e 15·1	16·4
Ithaca	34·3	35	—	—	—	—	e 14·0	—
Ottawa	36·7	31	13 0	?S	(13 0)	−20	e 22·0	—
Victoria	37·6	337	17 27	?SR_1	—	—	19·0	21·4
Granada	86·5	53	(12 58)	+ 2	—	—	13·0	—
De Bilt E.	87·4	36	—	—	—	—	e 52·0	—
Uccle	87·5	38	—	—	—	—	—	49·0
Taihoku	121·9	314	67 7	?L	—	—	(67·1)	—
Colombo	157·6	357	44 30	?SR_1	—	—	—	66·0

Additional readings and notes: Colima readings have been increased by 1m.; possibly they refer to an earlier shock. Puebla readings have been diminished by 7m. Merida gives also PZ = +3m.18s. Tucson MN = +10·4m. Toronto L = 21h.16m.48s. and 21h.43m.18s. Ithaca e = +20m.0s. Ottawa i = +20m.45s., L = +23·5m.

Sept. 29d. Readings also at 1h. (Tortosa), 3h. (Tiflis), 4h. (near Osaka), 6h. (La Paz), 18h. (Malaga and near Granada), 20h. (near Tacubaya), 21h. (La Paz and near Tacubaya), 22h. (near Malaga, also near Colima, Tacubaya, Vera Cruz, and Taihoku), 23h. (Strasbourg).

Sept. 30d. 23h. 35m. 6s. Epicentre 32°·2N. 110°·1W. (as on 1920 June 4d.).

$A = -\cdot291$, $B = -\cdot794$, $C = +\cdot533$; $D = -\cdot939$, $E = +\cdot344$; $G = -\cdot183$, $H = -\cdot500$, $K = -\cdot846$.

Very rough.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tucson	0·6	275	i 0 6	− 3	—	—	—	0·4
Denver	8·5	28	—	—	—	—	8·9	—
Berkeley	11·5	302	—	—	e 4 13	−54	—	—
Chicago	20·2	55	—	—	7 21	−66	—	—
Georgetown N.	27·5	66	—	—	e 11 2	+12	—	—
Washington	27·5	66	—	—	e 11 43	+53	—	—
Ithaca	28·4	59	—	—	e 11 24	+18	—	—
Ottawa	29·5	53	—	—	i 11 45	+19	—	—

Additional readings: Tucson gives also eN = 23h.35m.3s. Chicago e = +6m.58s. Georgetown eE = +11m.5s.

Sept. 30d. Readings also at 0h. (near Belgrade), 3h. (2), 4h., and 5h. (near Tacubaya), 8h. (Honolulu, Mendoza, Cipolletti, Pilar, and Tacubaya), 9h. (La Paz), 11h. (near Mizusawa), 18h. (La Paz), 19h. (Stonyhurst and near Merida), 20h. (near Taihoku), 22h. (near La Paz).

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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