

BULLETIN

FOR THE YEAR

== 1916. ==

1916. January 1d. 13h. 20m. 13s.

Epicentre 5°58. 154°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
Sydney	E.	28.5	185	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Riverview	W.	28.5	185	13 26 42	+ 16	13 32 0	13 32 0	+ 39	13 24 36	13 44 29	
Addside	M.	28.7	184	13 29 32	+ 18	13 31 35	13 31 35	+ 14	13 34 36	13 37 0	a
Melbourne	W.	32.7	204	13 57 54	+ 18	13 31 48	13 31 48	+ 126	13 32 30	13 41 54	
Manila	W.	38.4	302	13 57 54	+ 16	13 36 27	13 36 27	+ 150	13 32 24	13 41 48	
Owaha	O.	38.4	302	13 57 54	+ 16	13 36 27	13 36 27	- 110	13 46 0	13 45 42	b
Perth	W. A.	43.8	338	13 58 38	+ 18	13 35 2	13 35 2	- 14	13 58 42	13 45 42	c
Mizusawa	M.	44.4	329	13 59 0	+ 3	13 35 30	13 35 30	- 21	13 35 18	13 45 42	
Batavia	N.	46.2	346	13 58 57	+ 2	13 35 23	13 35 23	- 9	13 42 35	13 48 0	d
Zi-ka-wei	W.	46.9	268	13 59 0	+ 1	13 35 59	13 35 59	+ 8	13 42 35	13 44 29	e
Honolulu	N.	48.1	322	13 29 10	+ 2	13 36 0	13 36 0	+ 48	13 42 35	13 50 32	
Calcutta	E.	54.2	58	13 29 11	+ 3	13 38 12	13 38 12	+ 3	13 46 52	13 57 36	
Cebu	M.	70.0	296	13 31 42	+ 12	13 40 35	13 40 35	+ 3	13 49 24	13 57 24	
Colombo	O. E.	70.0	296	13 31 42	+ 12	13 40 35	13 40 35	+ 3	13 49 24	13 57 24	
Kuala Lumpur	M.	72.0	276	13 32 24	+ 1	13 32 24	13 32 24	+ 14	13 41 24	13 42 24	
Singapore	M.	77.0	582	13 32 24	0	13 42 42	13 42 42	- 14	13 52 36	14 13 12	
Bombay	M.	81.7	503	13 32 42	+ 18	13 44 9	13 44 9	- 2	13 52 0	14 14 3	
Benkeley	N.	83.5	290	13 33 10	+ 18	13 44 6	13 44 6	+ 28	14 1 30	14 5 18	f
Victoria, B.C.	E.	88.5	52	13 33 3	+ 21	13 44 48	13 44 48	- 30	14 1 30	14 17 30	g
Tashkent	E.	88.5	52	13 33 42	+ 1	13 45 4	13 45 4	- 70	14 12 0	14 18 32	i
Mauritius	M.	89.4	41	13 33 24	+ 14	13 47 15	13 47 15	- 36	14 18 0	14 11 22	j
Ekaterinburg	G.	89.7	312	13 33 13	h	13 48 18	13 48 18	- 43	14 9 0	14 27 11	k
Tiflis	G.	93.8	349	13 40 24	- 10	13 41 30	13 41 30	m	13 57 24	14 32 48	l
Pulkovo	G.	108.3	327	13 34 52	0	13 41 30	13 41 30	- 38	14 10 0	15 16 12	n
Yokohama	G.	111.3	312	13 34 53	0	13 41 30	13 41 30	- 38	14 10 0	15 16 12	
Palkeyevka	G.	111.3	312	13 32 16	0	13 41 30	13 41 30	- 38	14 10 0	15 16 12	
Yokohama	G.	119.8	349	13 39 16	+ 240	13 41 30	13 41 30	- 38	14 10 0	15 16 12	
Helwan	N.	120.9	302	13 37 12	+ 54	13 40 39	13 40 39	- 38	14 10 0	15 16 12	
Ottawa	E.	121.3	39	13 36 54	0	13 40 39	13 40 39	- 38	14 10 0	15 16 12	
Cape Town	E.	122.4	224	13 42 48	0	13 40 39	13 40 39	- 38	14 10 0	15 16 12	

Washington	N.	---	122.6	46	13 41 13	+ 305	---	? 50 0	+ 38	13 58 49	---	---
	E.	---	122.6	46	13 41 7	+ 299	---	---	---	13 58 44	---	---
Dyce, Aberdeen N.	Ma.	---	125.0	344	1 41 38	+ 319	? 48 48	13 51 28	+109	14 13 0	14 41 0	a
Harvard Univ.	B.O.	---	125.7	40	13 41 30	+ 308	---	13 48 26	- 78	13 10 10	14 27 20	---
Edinburgh	M.	---	126.4	344	13 42 0	+ 335	---	---	---	---	---	---
Paisley	E.	M.	126.8	345	13 41 0	+ 274	---	---	---	---	14 47 48	---
De Bilt	N.	W.	126.9	342	---	---	---	i 49 4	- 48	e 18 0	---	---
Eskdalemuir	N.	G.	126.9	344	? 39 49	+ 202	---	i 49 1	- 51	---	---	---
Stonyhurst	M.	---	128.0	343	13 29 30	---	---	13 41 48	---	---	14 39 24	s
Padova	V.	---	128.3	327	13 39 49	+ 196	---	13 48 10	-112	14 36 28	---	---
Bidston	N.	M.S.	128.5	343	---	---	---	13 41 42	---	---	14 35 0	---
Kew	M.	---	129.3	340	13 42 0	+ 322	---	---	---	---	14 44 54	---
Pompeii	N.	O.A.	129.5	320	13 39 58	+ 199	---	---	---	---	---	---
	E.	O.A.	129.5	320	13 39 53	+ 194	---	13 52 53	+163	---	---	---
Monte Cassino	N.	V.	129.5	340	13 39 51	+ 192	---	---	---	---	---	---
Haslemere	M.	---	129.8	340	---	---	---	---	---	---	14 34 35	---
Rocca di Papa	Aga.	---	130.0	322	13 39 50	+ 189	13 43 15	13 49 13	- 61	13 59 42	14 35 36	---
Paris	---	---	130.4	336	13 39 57	+ 194	---	13 52 21	+125	14 21 0	14 35 36	w
La Paz	---	---	132.9	118	13 39 54	+ 180	13 43 50	13 54 54	+261	14 15 0	14 17 55	z
Barcelona	Ma.	---	136.1	329	e 40 1	+ 174	---	? 43 38	---	14 1 13	14 34 0	z
Moncalieri	S.	---	137.4	325	? 39 15	+ 151	---	13 49 27	- 52	14 5 28	aa	---
Coimbra	W.	---	141.8	338	? 40 25	+ 174	---	13 47 0	-267	14 2 0	14 35 29	---
Granada	C.	---	142.3	330	---	---	13 40 19	? 51 21	- 9	14 3 0	14 11 48	bb
Rio Tinto	M.	---	143.2	334	13 40 0	+ 143	---	---	---	---	14 48 0	---
San Fernando	N.	M.	144.1	332	13 40 18	+ 158	---	---	---	14 34 30	14 50 0	---
	E.	M.	144.1	332	13 41 0	+ 200	---	---	---	14 32 0	14 55 0	---
Accra	---	---	154.3	268	13 41 0	+ 159	---	---	---	---	13 42 0	---
Ascension	M.	---	162.2	221	13 41 0	+ 131	---	---	---	---	14 4 0	---

NOTES.—a, i 13h. 26m. 4s.; PS 13h. 32m. 5s. b, MN 13h. 54m. 22s.; ME 13h. 52m. 12s. c, MN 13h. 42m. 15s.
d, e L 13h. 40m. 0s. e, SRN 13h. 40m. 21s.; SRE 13h. 40m. 20s. f, M ? 12m g, i 13h. 37m. 9s.
h, O—C. +394s. i, 2°N. 153°5E. j, i PS 13h. 49m. 14s.; SR, 13h. 55m. 23s.; 0°0N. 151°0E.
k, i 13h. 39m. 52s. l, One of the largest earthquakes. m, O—C. -459s. n, i 13h. 46m. 34s.
13h. 48m. 6s., and 13h. 51m. 0s. o, O—C. +401s. p, M 14h. 2m. 18s. and 14h. 35m. 48s. q, SR 13h. 58m. 58s.
r, M 14h. 40m. 36s., 14h. 45m. 36s., and 14h. 50m. 30s. s, e 13h. 43m. 1s. t, O—C. -421s.
u, O—C. -492s. v, O—C. -520s. w, i 13h. 42m. 4s. and 13h. 42m. 17s.; e 13h. 53m. 37s.
x, i SR 14h. 0m. 24s. y, O—C. -430s. z, i 13h. 54m. 40s. aa, i 13h. 42m. 12s.; MN 14h. 41m. 47s.
ME 14h. 41m. 50s. bb, SR 13h. 54m. 34s. and M 14h. 50m. 25s.

1916. January 13d. 6h. 18m. 16s.

Epicentre 2°0S. 137°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O—C.	PR ₁	S.	O—C.	L.	M.	Notes Ref.
Manila	W.	23.0	317	6 23 34	+ 1	---	6 27 49	+ 8	6 32 0	a	---
Batavia	W.	30.4	261	6 24 33	- 15	---	6 29 53	- 4	---	6 30 15	---
Adelaide	M.	33.0	176	6 24 30	- 42	---	---	---	6 29 48	6 36 24	---
Sydney	E.	34.5	159	6 23 b	- 133	---	6 30 42	- 22	6 36 36	---	---
Riverview	W.	31.5	159	6 25 12	- 13	6 26 43	6 30 37	- 27	6 35 0	6 40 15	c
	W.	34.5	159	6 25 24	- 1	---	---	---	---	---	---
Perth, W.A.	M.	36.0	212	6 24 48	- 50	d	6 30 6	- 80	---	6 40 54	e
Zi-ka-Wei	W.	36.4	337	6 25 47	+ 6	E 27 13	N 31 20	- 12	---	6 40 24	e
Melbourne	M.	36.5	169	6 26 24	+ 42	---	6 31 18	- 15	6 37 42	6 39 6	f
Osaka	O.	36.7	358	6 25 45	+ 1	---	6 31 28	- 8	6 35 47	x 38 45	f
Mizusawa	N.	41.3	5	6 26 27	+ 6	---	6 32 46	+ 5	---	---	---
	E.	41.3	5	6 26 27	+ 6	---	6 32 43	+ 2	---	---	---
Calcutta	N.	53.4	300	6 27 54	+ 9	---	6 35 42	+ 25	---	---	---
	E.	53.4	300	6 27 45	+ 3	---	6 35 36	+ 19	---	---	---
Colombo	M.	57.8	279	6 27 49	- 67	---	6 27 49	? P	6 35 12	6 44 12	---
Kodaikanal	M.	60.5	283	6 27 48	- 44	---	---	---	6 48 6	6 49 42	---
Irkutsk	G.	60.9	338	6 28 50	+ 16	---	i 37 6	+ 15	6 45 0	6 48 48	---
	G.	60.9	338	6 29 1	+ 27	---	---	---	---	---	g
Simla	O.E.	65.7	306	6 29 12	+ 7	---	6 37 54	+ 5	6 45 54	6 50 48	---
Bombay	E.	66.5	292	6 27 31	- 100	---	---	---	---	6 58 47	---
Honolulu	M.	67.7	64	6 30 0	+ 42	---	---	---	6 39 18	7 0 0	---
Tashkent	G.	74.9	314	6 30 4	+ 10	---	6 39 46	+ 5	6 52 0	6 56 55	h
	G.	74.9	314	6 30 17	+ 13	---	6 39 49	+ 8	---	---	---
	G.	74.9	314	6 30 31	+ 27	---	6 39 51	+ 10	---	---	---
Mauritius	N.	79.1	250	6 38 12	---	i	---	---	---	7 4 6	---
	E.	79.1	250	6 32 36	+ 126	---	---	---	---	7 2 30	---
Ekaterinburg	G.	84.3	328	6 31 6	+ 6	---	6 41 20	- 7	---	---	j
Thiis	G.	93.0	312	6 31 46	- 2	---	6 42 20	- 41	7 0 0	7 25 16	---
Victoria, B.C.	M.	98.0	42	6 43 30	---	? S	6 43 30	- 22	7 7 0	7 19 6	---
Berkeley	---	99.7	52	6 43 18	---	? S	6 43 18	- 51	---	E 16 55	---
Pulkovo	G.	100.1	331	6 32 20	- 7	6 35 51	6 43 53	- 20	7 0 0	7 5 59	k
Lack	W.	100.3	53	---	---	---	---	---	---	---	l
Helwan	N.	104.5	300	6 37 42	+ 294	---	6 44 0	- 54	---	---	---
	E.	104.5	300	6 34 12	+ 84	---	6 43 48	- 66	---	---	---

Cape Town	E.	M.	112-1	232	6 42 42	<i>m</i>	---	---	---	8 45 0	<i>n</i>
Padova		V.	115-3	321	6 36 35	+ 177	---	6 43 58	-150	---	---
Pompeii	N.	O.A.	115-4	315	6 39 0	+ 322	---	---	---	---	---
Monte Cassino	N.	V.	115-7	316	6 38 33	+ 293	---	---	---	---	---
De Bilt	E.	W.	116-0	320	---	---	---	i 44 11	- 23	e 13 0	7 19 24 <i>o</i>
Dyce, Aberdeen		Ma.	116-0	337	---	---	---	---	---	7 18 0	---
Rocca di Papa		Aga.	116-3	317	6 37 34	+ 232	---	? 44 30	+126	7 18 48	---
Edinburgh		M.	117-4	336	6 45 0	? S	---	6 45 0	-105	---	---
Eskdalemuir		G.	117-7	336	---	---	---	---	---	---	7 19 0
Moncalieri		S.	118-3	322	6 38 46	+ 295	---	6 55 10	+498	7 14 46	---
Stonyhurst		M.	118-4	333	6 44 0	? S	---	? 44 0	-173	---	7 21 42
Bidston	N.	M.S.	119-0	334	6 39 12	+ 318	---	6 52 36	+338	---	7 38 0
Paris		---	119-2	327	6 38 51	+ 296	6 43 27	6 48 39	+100	7 12 0	7 16-17 <i>q</i>
		---	119-9	331	---	---	---	---	---	---	---
Shide		M.B.	---	---	---	---	---	6 44 26	- 4	7 13 5	---
Barcelona		Ma.	123-5	320	6 39 27	+ 312	---	? 56 1	+509	7 17 35	7 23 16
Toronto		M.	127-3	33	6 50 36	<i>r</i>	---	6 57 24	+566	7 9 18	7 39 54
Ottawa		B.	128-0	29	---	---	---	---	---	7 14 0	---
Granada		C.	129-5	319	---	---	---	? 51 30	+196	7 8 0	7 30 25 <i>t</i>
Coimbra		W.	130-6	326	6 40 4	+ 318	---	6 57 36	+555	7 19 30	7 27 28
Rio Tinto		M.	131-1	321	6 38 0	+ 192	---	---	---	---	---
San Fernando		M.	131-6	320	6 38 18	+ 208	---	6 57 36	+549	7 30 18	7 45 0
Washington		---	131-8	35	---	---	---	---	---	7 27 18	---
Harvard Univ. N.		B.O.	132-4	28	e 40 30	---	---	---	---	---	---
Azores	E.	B.O.	132-4	28	---	---	---	? 47 41	- 52	e 26 6	E 34 59 <i>u</i>
La Paz		M.	140-9	338	6 40 12	+ 281	---	---	---	---	---
		---	140-9	127	6 38 29	+ 146	---	6 52 30	+142	7 22 0	7 50 5 <i>v</i>

Notes.—*a*, MN 6h. 33m. 22s. and 6h. 35m. 8s. *b*, ? 12s. *c*, i PS 6h. 30m. 58s.; i SR 6h. 33m. 21s., 5°-0s., 137°-0s.
d, PR₁ given as 6h. 30m. 6s. *e*, PS 6h. 31m. 54s.; SRN 6h. 33m. 1s.; PRN 6h. 27m. 16s. *f*, MN, 6h. 42m. 49s.
g, 0°-38. 141°-8E. *h*, The times given in P. and S. were recorded as i P, i P₁, i P, and i S₁, i S₂, i S₃, each increased by 9m.
i, O—C. +462s. *j*, 2°-7S. 130°-3E. *k*, i 6h. 43m. 5s.; PS 6h. 45m. 17s.; SR, 6h. 50m. 54s.; 1°-0N. 137°-0E. *l*, e 6h. 37m. 4s. *m*, O—C. +559s. *n*, M 8h. 54m. 48s. and 9h. 30m. 6s. *o*, MN 7h. 19m. 10s.
ME 7h. 21m. 39s. *p*, MN 7h. 33m. 18s.; ME 7h. 35m. 23s. *q*, e 6h. 55m. 31s. *r*, O—C. +965s. *s*, i 6h. 40m. 48s., 6h. 49m. 10s., and 6h. 50m. 0s. *t*, i 6h. 37m. 46s. and 6h. 40m. 15s. *u*, e E 6h. 41m. 53s., e 6h. 41m. 21s., and e N 6h. 41m. 28s. *v*, i 6h. 38m. 35s., 6h. 49m. 33s., and 7h. 1m. 21s.

1916. January 13d. 8h. 20m. 25s.

Epicentre 2°-5S. 138°-0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁	S	O-C.	<i>l</i> .	M.	Notes Ref.
				H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.		
Manila	W.	24-0	316	8 25 46	---	7	---	8 30 0	- 9	---	---	---
Batavia	W.	31-3	263	8 26 45	---	21	---	8 31 57	- 24	---	8 33 0	---
Adelaide	M.	32-5	179	8 27 12	---	5	---	---	---	8 32 18	8 35 6	---
Riverview	W.	33-7	160	8 27 33	+	3	8 29 10	8 32 59	- 2	8 36 25	8 37 51 <i>a</i>	---
	W.	33-7	160	8 27 41	-	14	---	---	---	---	---	---
Melbourne	M.	35-9	171	8 28 24	+	38	---	8 33 36	+ 1	8 36 30	<i>b</i>	---
Perth, W.A.	M.	36-1	213	8 27 20	-	28	---	---	---	8 32 50	8 37 30	---
Zi-ka-wai	W.	37-2	336	8 27 54	-	3	---	8 33 26	- 26	---	N 40 31 <i>c</i>	---
Osaka	O.	37-3	359	8 28 5	+	3	---	8 33 42	- 11	8 38 3	<i>d</i>	---
Mizusawa	N.	O.	41-8	4	8 28 37	+	3	8 34 56	- 1	---	---	---
	E.	O.	41-8	4	8 28 37	+	3	8 35 2	+ 5	---	---	---
Calcutta	N.	O.E.	54-8	300	8 30 12	+	9	---	---	8 37 36	8 51 12	---
	E.	O.E.	54-8	300	8 30 6	+	3	---	---	8 37 36	---	---
Colombo	M.	58-9	280	8 30 0	-	29	---	---	---	8 37 48	8 49 24	---
Kodaikanal	M.	61-6	283	? 30 48	---	0	---	---	---	8 38 42	8 55 0	---
Irkutsk	G.	61-8	337	8 31 4	+	15	---	8 39 26	+ 15	8 47 0	8 52 42	---
Simla	O.E.	66-8	306	8 31 24	+	2	---	8 40 0	- 12	8 48 18	8 54 18	---
Honolulu	M.	67-0	65	8 32 30	+	67	---	8 42 0	+105	8 52 30	8 58 0	---
Bombay	E.	M.	67-5	292	8 31 39	+	13	---	---	---	8 54 2	---
Tashkent	G.	76-0	314	8 32 21	+	6	---	8 42 0	- 2	---	9 1 38 <i>e</i>	---
Mauritius	M.	79-9	259	---	---	---	---	---	---	---	---	---
Ekaterinburg	G.	85-3	328	8 33 16	+	1	<i>g</i>	8 43 28	- 19	<i>f</i>	---	<i>h</i>
Tiflis	G.	94-1	312	8 34 1	---	---	---	? 44 15	- 37	9 8 0	9 19 51	---
Victoria, B.C.	M.	97-7	42	8 33 0	-	83	---	1 45 30	- 28	9 6 30	9 27 0	<i>i</i>
Pulkovo	G.	101-0	331	8 34 38	-	2	8 38 4	8 46 15	- 15	---	9 6 12 <i>j</i>	---
Padova	V.	116-4	321	8 39 54	+	242	---	8 47 39	- 67	9 41 54	---	---
Pompeii	N.	O.A.	116-5	315	? 41 0	+ 308	---	---	---	8 41 50	8 42 0	---
Bidston	N.	M.S.	116-6	335	---	? S	---	? 50 0	+ 72	---	9 40 0	---
Monte Cassino	N.	V.	116-7	316	8 40 5	+ 252	---	---	---	---	---	---
De Bilt	N.	W.	117-0	335	---	---	---	1 48 54	+ 3	e 9 0	9 16 3 <i>k</i>	---
Rocca di Papa		Aga.	117-3	317	8 39 18	+ 202	---	8 46 27	-146	e 0 54	9 33 18	---
Faisley		M.	118-7	337	---	---	---	---	---	---	9 27 0	---
Eskdalemuir		G.	118-7	336	---	---	---	e 50 57	+112	9 12 0	9 15 0	---
Stonyhurst		M.	119-3	334	---	---	---	---	---	---	9 34 24	---

Moncalieri	S.	119.3	322	8 40 38	+ 274	—	? 54 56	+ 347	9 10 58	<i>l</i>	
Paris	—	120.1	328	8 40 56	+ 288	8 46 44	8 51 0	+ 105	9 10-20	9 21-22	
Shide	M.B.	120.9	331	—	—	—	8 51 16	+ 115	9 13 5	9 23 0 <i>m</i>	
Barcelona	Ma.	124.5	321	8 41 29	+ 300	—	? 52 52	+ 184	9 18 57	9 22 20 <i>n</i>	
Toronto	M.	127.2	33	—	—	—	—	—	9 0 12	9 41 18	
Ottawa	B.	127.9	30	—	—	? 42 38	—	—	9 0 0	—	
Granada	C.	130.6	319	e 40 6	+ 191	—	? 53 41	+ 191	i 0 0	<i>r</i>	
Coimbra	W.	131.6	326	8 40 16	+ 197	8 43 40	8 54 16	+ 220	9 18 44	9 30 30	
Washington	N.	131.6	37	8 40 22	+ 203	—	8 43 52	- 104	9 0 24	—	
	E.	131.6	37	8 40 18	+ 199	—	8 43 49	- 407	9 0 21	9 29 4	
Harvard Univ.	N.	B.O.	132.4	29	8 44 1	+ 418	i 49 30	8 52 29	+ 107	9 1 8	9 43 50
	E.	B.O.	132.4	29	8 43 59	+ 416	—	—	—	9 1 23	9 35 6
San Fernando	M.	133.1	320	—	—	—	—	—	9 30 18	9 48 30	
La Paz	—	147.9	127	—	—	—	—	—	9 24 0	9 27 6	
Ascension	M.	150.5	249	8 43 0	+ 281	8 45 0	8 54 44	+ 152	—	8 58 0	

NOTES.—*a*, PS 8h. 33m. 28s. 5°-08. 137°-2e. *b*, Sh. 37m. 0s. to 8h. 48h. 30s. *c*, PSN 8h. 34m. 4s.; SRN 8h. 35m. 30s.; RSE 8h. 35m. 50s. *d*, MN 8h. 40m. 36s.; ME 8h. 45m. 23s. *e*, Time given for P recorded as *e*, also P₁ Sh. 32m. 26s., i P₂ Sh. 32m. 31s., and i P₃ Sh. 32m. 39s. *f*, LN 8h. 39m. 0s.; LE 8h. 40m. 48s. *g*, i P 8h. 33m. 20s. and 8h. 33m. 23s. *h*, 3°-9s. 128°-1E. *i*, Several earthquakes 7h.-12h. *j*, Overlap of two quakes; i 8h. 45m. 26s., i°-08. 138°-0E. *k*, ME 9h. 16m. 5s. *l*, MN 9h. 29m. 28s.; ME 9h. 37m. 23s. *m*, Overlap of two quakes. *n*, i 8h. 58m. 35s. *o*, SN 8h. 48m. 6s.; SE 8h. 48m. 18s. *p*, O-C. -125s. and -113s. *q*, M 9h. 29m. 6s. and 9h. 33m. 33s. *r*, i 8h. 40m. 13s., i S ? 8h. 53m. 41s.; SR 8h. 54m. 50s.

1916. January 13d. 10h. 50m. 45s. Epicentre 2°-5S. 136°-5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁		S.		O-C.	L.		M.		Notes Ref.
				H. M. S.	s.	H. M. S.	H. M. S.	s.	H. M. S.	s.	H. M. S.	H. M. S.				
Manila	W.	23-0	319	10 56 2	—	0	—	11 0 7	—	3	11 4 12	—	a	—	—	
Batavia	W.	29-8	262	10 57 12	+	1	—	? 57 56	—	-260	—	11 3 0	—	11 3 0	—	
Adelaide	M.	32-5	177	—	—	—	—	—	—	—	11 2 24	—	11 14 0	—	—	
Riverview	W.	34-2	158	10 57 56	+	4	—	11 3 30	+	2	11 7 0	—	11 9 47	—	—	
Melbourne	M.	36-1	169	10 58 54	+	46	—	11 3 18	—	38	11 6 12	—	11 11 6	—	—	
Zi-ka-wei	W.	36-6	338	10 58 8	+	4	—	11 3 58	—	5	—	—	b	—	—	
Osaka	O.	37-2	358	10 58 37	+	20	—	11 4 11	—	1	11 8 56	—	c	—	—	
Mizusawa	N.	O.	41-9	5	10 58 42	—	13	—	11 5 11	—	8	—	—	—	—	
	E.	O.	41-9	5	10 58 37	—	18	—	11 5 8	—	11	—	—	—	—	
Tashkent	G.	76-0	300	—	—	—	—	—	—	—	e 54 0	—	11 3 32	—	—	
Mauritius	N.	M.	78-4	250	—	—	—	—	—	—	—	—	10 58 36	—	d	
	E.	M.	78-4	250	—	—	—	—	—	—	—	—	10 54 6	—	d	
Tiflis	G.	93-0	312	11 4 24	+	7	—	e 15 0	—	-30	—	—	—	—	e	
Victoria, B.C.	M.	98-7	41	—	—	—	—	—	—	—	11 42 42	—	11 47 54	—	—	
Pulkovo	G.	100-1	331	—	—	—	—	—	—	—	11 32 0	—	11 38 10	—	—	
Shide	M.B.	120-1	331	11 7 5	+	37	—	—	—	—	—	—	—	—	—	
Toronto	M.	128-0	33	—	—	—	—	—	—	—	12 7 24	—	12 12 30	—	—	
La Paz	—	147-9	59	11 11 1	+	137	—	—	—	—	—	—	12 27 10	—	—	

NOTES.—*a*, MN 11h. 6m. 1s.; ME 11h. 5m. 22s. *b*, MZ 11h. 31m. 30s. and 11h. 33m. 36s. *c*, MN 11h. 17m. 36s.; ME 11h. 28m. 35s. *d*, The times given for M are very early. *e*, e 11h. 8m. 12s.

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1916. January 24d. 6h. 55m. 7s. Epicentre 41°0N. 37°0E.

Station and Component	Machine.	Distance Epicentre.	Azimuth.	P.	O--C.	PR ₁	S.	O--C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Tiflis	G.	5.9	80	6 56 40	+ 2	—	6 58 20	+ 32	—	6 58 36	
Makeyevka	G.	7.1	5	6 57 13	+ 18	—	—	—	—	7 9 58	a
Helwan	N.E. M.	17.0	204	6 57 54	+ 12	—	—	—	—	—	
Pompeii	N. O.A.	17.0	277	6 59 17	+ 5	—	7 1 50	- 35	7 6 12	—	
	E. O.A.	17.0	277	6 59 14	+ 2	—	7 2 0	- 25	7 5 42	—	
	V. O.A.	17.0	277	6 59 25	+ 13	—	7 1 55	- 30	7 6 50	—	
Monte Cassino N.	V.	17.3	277	6 59 13	- 3	—	—	—	—	—	
Malta	M.	18.1	266	6 59 0	- 25	—	—	—	—	7 14 0	
Padova	V.	18.7	292	6 59 38	+ 6	—	7 2 52	- 10	—	7 9 45	
Pulkovo	G.	19.2	350	6 59 44	+ 5	—	7 3 26	+ 13	—	—	
	G.	19.2	350	6 59 47	+ 8	—	7 3 32	+ 19	7 5 0	7 9 9	b
Moncalieri	S.	21.7	291	7 0 7	- 1	—	7 2 18	- 108	7 4 41	c	
Ekaterinburg	G.	22.0	35	7 0 13	+ 1	—	7 4 56	+ 44	—	—	
	G.	22.0	35	7 0 16	+ 4	—	—	—	—	—	
Taskhent	G.	24.2	78	7 0 31	- 6	—	7 4 47	- 8	—	—	d
	G.	24.2	78	7 0 40	+ 3	—	—	—	—	—	
De Bilt	E. W.	24.4	305	7 0 40	+ 1	—	7 5 8	+ 9	e 7 30	7 8 13	e
Paris	—	25.4	300	7 0 47	- 2	—	f	g	7 9 0	7 10 11	
Barcelona	Ma.	26.0	282	7 0 50	- 5	—	7 5 27	- 2	7 7 27	7 9 30	
Kew	M.	27.4	305	7 1 0	- 9	—	—	—	—	7 17 30	
Siide	M.S.	28.0	303	7 1 13	- 2	—	7 5 59	- 7	—	7 14 0	
	M.B.	28.0	303	7 1 13	- 2	—	7 5 59	- 7	—	7 14 0	
West Bromwich	M.	28.6	307	7 1 15	- 6	—	7 6 6	- 11	—	7 21 0	
Stonyhurst	M.	29.1	309	7 0 48	- 38	—	—	—	—	7 14 12	
Bidston	N. M.S.	29.4	308	7 1 42	+ 13	—	7 5 30	- 61	—	7 18 36	
Dyce, Aberdeen	Ma.	29.7	315	7 1 14	- 18	—	7 6 7	+ 5	7 11 16	7 16 21	
Eskdalemuir	G.	29.8	312	7 1 32	- 1	—	7 6 30	- 8	—	7 16 0	
Edinburgh	M.	29.9	313	7 1 0	- 34	—	—	—	—	?	
Paisley	M.	30.6	313	—	—	—	—	—	—	7 17 30	
Granada	C.	31.4	276	7 1 40	- 9	—	7 7 0	- 5	—	—	
Rio Tinto	M.	33.5	279	7 2 0	- 8	—	—	—	—	7 20 0	
San Fernando	M.	33.6	277	7 1 54	- 14	—	7 6 56	- 45	7 11 0	7 21 0	
Simla	O.F.	33.6	96	7 1 42	- 26	—	7 7 6	- 35	7 13 0	7 14 30	
Coimbra	W.	34.1	286	7 2 0	- 13	—	7 7 16	- 33	7 11 2	7 17 48	

Bombay	E.	M.	37.7	115	7 3 47	+ 64	—	—	—	—	7 20 35
Irkutsk		G.	45.8	52	7 3 40	— 6	7 5 37	7 10 27	— 5	7 17 0	7 19 35
		G.	45.8	52	7 3 47	+ 1	—	7 10 35	+ 3	—	—
Calcutta	E.	O.E.	46.6	97	7 3 30	— 21	—	7 10 6	— 37	7 17 6	7 21 30 <i>j</i>
Kodaikanal		M.	47.1	119	7 9 36	+ 341	—	7 9 36	— 73	7 13 48	7 35 54
Azores		M.	47.5	287	7 3 0	— 58	—	—	—	—	7 31 0
Colombo		M.	51.1	120	7 4 36	— 15	—	7 15 0	+ 201	7 23 0	7 35 24
Zi-ka-wei		W.	66.3	68	7 6 10	+ 10	—	7 14 52	+ 4	7 29 14	N 35 57
St. Helena		M.	69.3	224	7 23 0	<i>k</i>	—	—	—	—	7 49 0
Osaka		O.	73.6	58	7 12 39	+ 352	—	7 21 20	+ 304	7 28 20	<i>l</i>
Harvard Univ. E.		B.O.	74.4	313	7 7 5	+ 13	—	7 16 36	+ 10	7 30 40	7 42 8 <i>m</i>
Ottawa		B.	74.7	318	7 7 6	+ 12	7 10 34	7 16 32	+ 3	7 30 36	<i>n</i>
Manila		W.	76.0	83	e 7 7	+ 5	—	7 15 18	— 86	7 39 12	<i>o</i>
Cape town	E.	M.	76.8	196	7 16 12	+ 8	—	7 16 12	— 42	7 36 18	7 40 36
Toronto		M.	77.8	319	? 13 42	+ 389	—	7 17 54	+ 49	7 23 30	7 46 42
Batavia		W.	79.1	108	c 7 0	— 21	—	—	—	—	7 19 0
Washington	N.	W.	80.3	314	7 7 0	— 28	—	—	—	—	—
	E.	W.	80.3	314	7 7 1	— 27	—	—	—	7 31 6	—
Victoria, B.C.		M.	89.0	347	—	—	—	7 19 0	— 10	7 33 54	7 49 6
Berkeley		—	98.8	344	—	—	—	—	—	—	<i>p</i>
Perth, W.A.		M.	102.0	121	? 45 40	<i>q</i>	—	—	—	? 52 25	8 1 0
La Paz		—	112.1	267	7 14 45	+ 271	—	7 24 6	+ 72	7 38 40	7 46 20
Honolulu		M.	116.2	16	? 23 6	? S	—	7 23 6	— 21	7 52 48	8 16 18
Adelaide		M.	120.0	112	7 21 6	? S	—	7 21 6	— 170	—	8 4 48
Melbourne		—	125.9	112	7 28 0	<i>r</i>	—	—	—	—	5 17 54
Riverview		W.	128.4	105	e 21 24	<i>s</i>	—	e 34 54	<i>t</i>	7 48 24	7 56 7
Sydney	E.	M.	128.5	105	—	—	—	—	—	8 7 36	8 10 12

NOTES.—*a*, P increased by 5min. *b*, 39° 5N, 33° 5E. *c*, MN 7h. 8m. 5s.; ME 7h. 8m. 40s. *d*, 17h. 0m. 54s.; 39° 5N, 38° 2E. *e*, SN 7h. 5m. 6s. *f*, e S 7h. 5m. 16s. and i S 7h. 5m. 24s. *g*, O—C. —2s. and +6s. *h*, 41s. ? *i*, M 7h. 17m. 36s. and 7h. 19m. 24s. *j*, 42° 5N, 35° 4E, and 43° 7N, 34° 1E. *k*, O—C. +1000s. *l*, MN 7h. 41m. 0s.; ME 7h. 39m. 14s. *m*, also SE. 7h. 21m. 38s.; *n*, SR₁ 7h. 21m. 50s. *o*, MN 7h. 46m. 52s.; ME 7h. 46m. 28s. *p*, e 7h. 40m. 33s. *q*, O—C. +2168s. *r*, O—C. +1003s. *s* and *t*, O—C. +597s.

1916. January 26d. 7h. 37m. 53s.

Epicentre 46°0N. 25°0E.

Station and Component.	Machine.	Distance from Epicentre.		Azimuth.	P.		O-C.	PR ₁	S.		O-C.	L.	M.		Notes Ref.
		°	'		H.	M.			S.	H.			M.	S.	
Padova	V.	9-1	271		7 40	8	-	2		7 42 40	+ 41		7 44	0	
	V.	9-1	271							7 42 46	+ 47				
Makeyevka	G.	9-1	72		7 40	22	+	12		7 42 12	+ 13		7 55	58	
	O.A.	9-3	239		7 40	10	-	3		7 41 50	- 14	7 42 30	7 43	30	
Pompeii	N.	9-3	239		7 40	12	-	1		7 42 0	- 4	7 42 40	7 43	40	
	E.	9-8	249		7 40	22	+	2		7 42 17	0		7 44	6 a	
Rocca di Papa	Aga.	9-8	249		7 40	22	+	2		7 42 17	0		7 44	6 a	
Moncalieri	S.	12-1	269		7 40	46	-	7		7 43 15	0	7 44 49		b	
Malta	M.	12-8	222		7 41	0	-	3					7 48	0	
Pulkovo	G.	14-1	11		7 41	24	+	4					7 45	42 c	
	G.	14-1	11							7 44 1	- 2	7 45 18			
De Bilt	—	14-6	303		7 41	24		0		7 44 34	+ 31				
Tiflis	G.	14-8	98		7 41	36	+	7		7 44 20	+ 5	e 45 15			
Paris	N.	15-4	288		7 41	38	+	1		7 44 43	+ 23	7 46 0	7 51	36 d	
	E.	15-4	288		7 41	38	+	1		7 44 30	- 4	7 46 0	7 47-48		
Helwan	N.	16-8	161		7 42	12	+	17		7 44 45	+ 11				
	E.	16-8	161		7 42	12	+	17							
Barcelona	M.	16-8	161		7 42	36	+	41							
	Ma.	17-1	263		7 41	54	-	5		7 45 15	+ 2	7 46 33	7 51	0	
Kew	M.	17-5	298		7 41	6	-	58					7 50	18	
Shide	M.S.	18-0	295		7 42	15	+	5		7 45 45	+ 12		7 50	0	
	M.B.	18-0	295		7 42	15	+	5		7 45 45	+ 12		7 50	0	
Stonyhurst	M.	19-2	304		7 42	18	-	6		7 46 6	+ 7	7 48 12	7 49	12	
	N.	19-6	303		7 42	24	-	5		7 46 18	+ 10		7 49	42	
Bidston	M.S.	19-6	303		7 42	24	-	5		7 46 18	+ 10		7 49	42	
Eskdalemuir	G.	20-0	308		7 42	40	+	6		7 46 20	+ 4		7 50	0	
Dyce, Aberdeen	Ma.	20-1	314		7 43	3	+	28		7 46 38	+ 20	7 49 28	7 51	0	
	G.	20-1	314		7 43	3	+	28		7 46 38	+ 20	7 49 28	7 51	0	
Edinburgh	M.	20-2	310		7 43	0	+	24					7 51	24	
Paisley	M.	20-8	309		7 42	0	-	44					7 56	30	
Granada	C.	23-0	257		7 43	10		0		7 47 10	- 8	7 49 44	7 53	43	
	G.	24-4	50		7 43	25		0		7 47 49	+ 4				
Ekaterinburg	G.	24-7	262		7 44	0	+	92					7 51	0	
Rio Tinto	M.	24-9	261		7 43	20	-	10					7 55	20	
Coinbra	W.	25-1	259		7 43	18	-	14		7 47 50	- 4	7 52 16	7 53	30	
San Fernando	M.	25-1	259		7 43	18	-	14		7 48 0	+ 2	7 51 0	7 53	30	
	G.	32-0	82		7 44	32	-	8		7 49 46	- 15	7 55 0	7 59	27 f	
Tashkent	G.	32-0	82		7 44	33	-	7		7 50 41	+ 40				
	G.	32-0	82		7 44	36	-	4							

Simla		O.E.	42.6	92	7 47 6	+ 58	---	---	---	8 2 48	8 3 42
Bombay	E.	M.	47.6	108	7 48 12	+ 88	---	---	---	8 2 36	8 11 50
Irkutsk		G.	49.6	52	7 46 58	+ 1	---	7 54 11	+ 4	8 6 4	8 6 6 <i>o</i>
Harvard Univ.		B.O.	64.6	306	---	---	---	7 57 25	+ 12	8 6 4	---
Ottawa		B.	65.1	310	? 50 14	+ 95	---	7 57 30	+ 11	8 7 30	---
Toronto		M.	68.2	311	---	---	---	---	---	<i>i</i>	8 17 42
Zi-ku-wei		W.	72.2	63	7 49 28	+ 4	---	---	---	---	<i>j</i>
Mizusawa	N.	O.	77.5	46	7 49 51	- 6	---	7 59 56	+ 8	---	---
	E.	O.	77.5	46	7 49 51	- 6	---	7 59 46	+ 2	---	---
Osaka		O.	77.9	52	7 50 26	+ 27	---	8 6 22	+ 390	8 19 41	<i>k</i>
Capetown		M.	80.1	185	---	---	---	---	---	---	8 32 6
Victoria, B.C.		M.	81.7	339	---	---	---	---	---	8 24 54	8 25 24 <i>l</i>
Batavia		W.	88.7	100	---	---	---	e 2 0	+ 7	---	---
La Paz		---	104.0	261	7 56 10	+ 227	---	8 10 43	+ 377	8 32 40	8 38 12
Honolulu		M.	112.6	3	---	---	---	---	---	8 34 6	8 46 12

NOTES.—*a*, e L 7h. 46m. 54s. *b*, MN 7h. 46m. 42s.; ME 7h. 46m. 22s. *c*, 46°-0N. 26°-0E. *d*, i 7h. 43m. 3s., 46°-3N. 23°-0E. *e*, 44°-9N. 25°-3E. *f*, e 7h. 45m. 8s.; i, 7h. 45m. 56s. *g*, 35°-2N. 36°-2E. *h*, 48s.?
i, L 8h. 0m. 0s. and 8h. 11m. 0s. *j*, MN 8h. 18m. 30s.; ME 8h. 18m. 31s. *k*, MN 8h. 24m. 55s.; ME 8h. 24m. 3s.
l, P given as 8h. 21m. 0s. and S as 8h. 23m. 30s.

1916. February 1d. 7h. 36m. 22s.

Epicentre 29°5N. 131°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Osaka	O.	6.2	31	a 38 2	+ 5	—	—	—	7 40 11	—	b
Z.-ka-wei	W.	8.9	284	7 38 44	+ 7	—	7 40 32	+ 10	—	7 43 50	
Mizusawa	N.	12.5	37	7 39 28	0	—	—	—	7 42 26	—	
	E.	12.5	37	7 39 28	0	—	—	—	7 42 23	—	
Manila	W.	17.8	215	e 40 33	- 4	—	7 44 0	+ 2	—	7 48 24	c
Calcutta	O.E.	39.2	270	7 44 6	- 4	—	7 49 54	- 23	—	7 54 48	
Batavia	W.	42.8	—	i 44 28	- 10	—	7 50 53	- 14	e 57 0	8 1 0	
Tashkent	G.	51.0	301	7 45 29	- 6	—	—	—	—	—	
	G.	51.0	301	7 45 36	+ 1	—	7 52 40	- 13	8 2 0	8 6 57	d
Colombo	M.	53.5	256	7 46 12	+ 20	—	—	—	—	8 11 36	
Kodaikanal	M.	53.9	260	7 46 12	+ 18	—	—	—	—	8 12 48	
Bombay	E.	54.1	274	7 45 49	- 7	—	—	—	—	8 14 35	
Ekaterinburg	G.	55.4	321	7 46 7	+ 3	—	7 53 50	+ 2	8 2 0	8 23 21	e
Perth, W.A.	M.	63.2	195	7 54 30	? S	—	? 54 30	- 55	—	—	
Honolulu	M.	63.3	79	7 46 48	- 8	—	—	—	8 4 30	8 13 24	
Adelaide	M.	64.8	174	7 47 30	+ 24	—	—	—	7 55 48	8 15 30	
Riverview	W.	66.0	162	7 47 15	+ 2	—	7 56 0	+ 1	8 3 18	8 6 45	
Sydney	M.	66.0	162	7 55 42	? S	—	7 55 42	- 17	8 8 18	8 13 30	
Tiflis.	G.	68.2	307	7 47 32	+ 5	—	—	—	—	—	f
	G.	68.2	307	7 47 38	+ 11	—	7 56 28	+ 2	—	—	
Melbourne	M.	68.4	169	i 55 54	? S	—	i 55 54	- 35	8 9 0	8 11 30	
Pulkovo	G.	70.1	328	7 47 42	+ 2	—	7 56 51	+ 2	—	8 22 29	g
	G.	70.1	328	7 47 48	+ 8	—	7 56 58	+ 9	8 6 0	8 23 18	
Victoria, B.C.	N.	77.5	41	7 54 12	+ 346	—	7 57 12	- 65	7 58 42	7 59 12	
Helwan	E.	83.5	301	—	—	—	—	—	—	8 31 24	
	M.	83.5	301	? 49 0	- 1	—	—	—	—	8 31 54	
Berkeley	—	83.6	50	7 49 11	+ 9	—	7 59 34	+ 8	—	—	
Dyce, Aberdeen	Ma.	85.0	337	7 49 25	+ 15	—	7 59 50	+ 9	? 15 30	8 35 5	
De Bilt	—	86.0	331	7 49 18	+ 3	—	7 59 41	- 11	e 17 0	8 32 45	
Edinburgh	M.	86.3	336	7 42 0	h	—	—	—	—	8 35 6	
Mauritius	E.	86.4	245	—	—	—	—	—	—	8 26 30	
Eskdalemuir	G.	86.8	336	7 49 19	- 1	7 52 55	7 59 45	- 16	8 14 0	8 29 0	
Paisley	M.	86.8	337	7 59 30	? S	—	? 59 30	- 31	—	8 29 0	
Padova	V.	87.2	322	7 49 21	- 1	—	7 59 41	- 24	8 17 23	8 34 3	

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Stonyhurst	M.	87.7	335	7 34 0	<i>j</i>	—	e 0 36	+ 25	8 27 0	8 35 48
Bidston	N. M.S.	88.2	335	7 49 30	+ 2	—	8 0 0	- 16	—	8 36 30
West Bromwich	M.	88.5	334	—	—	—	7 59 56	- 24	—	—
Kew	M.	88.6	332	7 52 6	+ 156	—	—	—	—	8 29 30
Monte Cassino	N. V.	88.7	318	7 49 29	- 2	—	—	—	—	—
Pompeii	N. O.A.	88.8	317	7 49 35	+ 4	—	8 0 0	- 23	—	—
	E. O.A.	88.8	317	7 49 30	- 1	—	8 0 0	- 23	8 26 0	—
	V. O.A.	88.8	317	7 49 28	- 3	—	—	—	—	—
Rocca di Papa	Aga.	89.1	319	7 49 35	+ 2	—	8 0 24	- 2	<i>k</i>	8 33 30
Paris	—	89.5	329	7 49 30	- 5	—	—	—	—	—
	—	89.5	329	7 49 33	- 2	—	8 0 0	- 31	8 22 0	8 28-29
Shide	M.S.	89.6	332	—	—	—	8 0 26	- 6	8 20 0	8 35 30
	M.B.	89.6	332	—	—	—	8 0 26	- 6	8 20 0	8 35 30
Moncalieri	S.	89.7	324	7 49 12	- 24	—	8 0 18	- 15	8 19 26	<i>l</i>
Barcelona	Ma.	95.0	324	e 52 49	+ 164	i 1 15	8 2 30	+ 62	? 12 34	8 40 0
Coimbra	E. W.	101.1	330	e 54 42	+ 102	—	8 0 50	- 98	8 34 54	8 35 38 <i>m</i>
Ottawa	B.	101.1	19	7 49 36	- 62	—	8 1 11	- 77	8 23 54	—
Granada	C.	101.2	325	e 50 33	- 5	—	8 3 48	+ 79	8 25 0	8 42 45
Toronto	M.	101.6	22	8 2 54	? S	—	? 2 54	+ 21	<i>n</i>	8 44 12
San Fernando	M.	103.0	326	7 55 0	+ 253	—	—	—	8 35 0	<i>o</i>
Harvard Univ. E.	B.O.	105.2	17	7 41 24	<i>p</i>	—	7 55 11	<i>q</i>	8 24 56	—
Azores	M.	109.5	341	8 0 30	? S	—	? 0 30	- 196	—	8 48 6
La Paz	—	157.8	59	7 56 31	+ 109	8 0 41	8 13 11	+ 261	8 41 0	8 43 30

NOTES.—*a*, Time given is for P.S. *b*, MN 7h. 40m. 37s. *c*, MN 7h. 51m. 38s.; ME 7h. 51m. 44s. *d*, P. also 7h. 45m. 47s., +12s.; e 7h. 56m. 42s., 23°-0N. 125°-0E. *e*, 31°-2N. 133°-5E. *f*, 40°-1N. 139°-8E. *g*, PS 7h. 57m. 43s.; SR, 8h. 1m. 54s., 29°-9N. 132°-5E. *h*, O-C. -437s. *i*, M 8h. 19m. 0s. and 8h. 20m. 0s. *j*, O-C. -925s. *k*, L 8h. 19m. 15s. and 8h. 23m. 12s. *l*, MN 8h. 36m. 29s.; ME 8h. 28m. 49s. *m*, also S? 8h. 9m. 34s. *n*, L 8h. 9m. 54s. and 8h. 16m. 12s. *o*, M 8h. 40m. 0s. and 8h. 44m. 30s. *p*, O-C. -573s. *q*, O-C. -475s.

1916. February 6d. 10h. 51m. 13s.

Epicentre 41°0N. 156°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. s.	s.	H. M. s.	H. M. s.	s.	H. M. s.	H. M. s.	
Mizusawa	N. O.	11-9	268	10 54 46	+ 35	—	10 56 37	+ 7	—	—	
	E. O.	11-9	268	10 54 46	+ 35	—	10 56 34	+ 4	—	—	
Osaka	O.	17-7	257	a 56 10	+ 44	—	—	—	10 59 14	b	
Zi-ka-wei	W.	29-7	263	10 57 51	+ 13	—	11 2 22	- 18	—	—	
	W.	29-7	263	—	—	—	11 2 26	- 14	—	—	
Irkutsk	G.	36-7	306	10 58 16	- 25	10 59 8	11 4 6	- 27	11 7 0	11 13 43	c
Manila	W.	40-6	240	e 0 0	+ 47	—	11 3 27	- 121	11 6 44	11 12 48	d
Honolulu	M.	43-0	103	—	—	—	—	—	11 7 24	11 10 36	e
Victoria, B.C.	M.	54-8	53	—	—	—	—	—	11 9 18	11 10 36	f
Calcutta	N. O.E.	59-3	274	11 1 48	+ 28	—	—	—	—	—	
	E. O.E.	59-3	274	11 1 42	+ 22	—	11 9 12	- 16	—	—	
Ekaterinburg	G.	59-5	321	11 1 22	+ 0	—	11 9 16	- 14	11 17 0	11 30 4	e
Tashkent	G.	62-6	302	11 1 46	+ 4	—	11 9 59	- 10	—	? 22 41	f
Batavia	W.	65-5	236	e 3 0	+ 59	—	i 11 24	+ 40	—	11 11 36	g
Pulkovo	G.	70-0	334	11 2 30	0	11 5 32	11 11 31	- 8	11 21 0	11 30 6	h
Riverview	W.	75-0	185	e 5 18	+ 136	—	—	—	—	—	
Colombo	M.	75-5	266	11 12 0	? S	—	? 12 0	- 45	—	—	
Makeyevka	G.	75-7	323	11 3 11	+ 5	11 6 41	11 12 49	+ 2	11 23 0	11 31 0	h
Tiflis	G.	76-8	315	11 3 10	- 3	—	11 12 59	- 1	—	11 40 4	i
Melbourne	—	79-5	189	11 15 24	? S	—	? 15 24	+ 113	—	11 22 0	
Toronto	M.	81-5	37	—	—	—	—	—	11 13 12	11 37 24	
Edinburgh	M.	81-6	349	11 7 0	+ 199	—	—	—	—	—	
Ottawa	B.	81-8	34	N 4 9	+ 27	—	iN 13 36	- 21	iE 13 50	—	
Stonyhurst	M.	83-5	348	—	—	—	—	—	—	11 26 0	
De Bilt	—	83-7	343	—	—	—	—	—	—	11 23 44	
Bidston	N. M.S.	83-9	348	11 4 24	+ 30	—	—	—	—	11 21 36	
Harvard Univ.	E. B.O.	86-2	33	—	—	—	i 14 39	- 6	? 15 40	—	
Paris	—	87-3	343	11 4 18	+ 4	—	—	—	—	—	
Padova	V.	87-9	336	11 4 22	+ 5	—	—	—	—	—	
Moncalieri	S.	89-6	338	11 4 30	+ 3	—	? 16 20	+ 57	11 30 17	i	
Rocca di Papa	Ara.	91-0	334	i 4 37	+ 3	—	—	—	—	—	
Pompeii	E. O.A.	91-3	332	11 0 45	- 231	—	—	—	—	—	

Helwan	N.	M.	92.8	315	11	5	0	+	16	—	—	—	—	—
	E.	M.	92.8	315	11	6	0	+	76	—	—	—	—	—
La Paz			134.5	71	11	11	29	+	209	—	—	—	—	—

NOTES.—*a.* Time given is for PS. *b.* MN 10h. 59m. 28s.; ME 10h. 59m. 29s. *c.* *i* 11h. 0m. 19s., 36°2N. 151°1E.
d. MN 11h. 7m. 43s.; ME 11h. 8m. 5s. *e.* *i*₁ 11h. 3m. 18s.; *i*₂ 11h. 4m. 8s.; *i*₃ 11h. 6m. 31s.; *i*₄ 11h. 8m. 36s.;
41°8N. 152°5E. *f.* 46°7N. 157°6E. *g.* SR₁ 11h. 16m. 0s., 40°6N. 151°5E. *h.* PR₂ 11h. 8m. 17s.;
SR₂ 11h. 17m. 30s.; SR₂ 11h. 20m. 30s., 46°4N. 166°1E. *i.* MN 11h. 5m. 10s.; ME 11h. 4m. 42s.

c

1916. February 6d. 21h. 51m. 19s.

Epicentre 48°5N. 178°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Mizusawa N.	O.	28.2	266	21 57 35	+ 6	—	22 2 10	- 12	—	—	
E.	O.	28.2	266	21 57 30	+ 1	—	22 2 21	- 1	—	—	
Honolulu	M.	33.0	137	21 59 6	+ 51	—	—	—	22 7 12	22 12 36	
Osaka	O.	34.5	263	21 58 41	+ 13	—	22 3 49	- 18	22 7 49	22 19 30	a
Victoria, B.C.	M.	37.7	67	21 58 12	- 43	—	? 5 48	+ 55	22 9 12	—	
Berkeley	—	43.4	81	—	—	—	N 6 7	- 6	—	—	
	—	43.4	81	21 59 42	+ 2	—	V 6 24	+ 11	V 12 12	V 16 52	
	—	43.4	81	—	—	—	E 6 26	+ 13	E 12 33	E 17 1	
Irkutsk	G.	45.4	304	21 59 36	- 19	—	—	—	—	—	
	G.	45.4	304	21 59 54	- 1	22 1 38	22 6 28	- 11	—	22 23 27	b
Zi-ka-wei	W.	45.9	270	21 59 56	- 2	—	22 6 44	- 2	—	—	c
Manila	W.	57.8	255	e 1 34	+ 17	—	22 9 39	+ 24	22 17 6	—	
Ekaterinburg	G.	62.8	327	22 1 48	- 2	e	22 10 14	- 3	—	—	
Toronto	M.	65.5	51	22 1 0	- 67	—	22 11 12	+ 22	g	22 29 16	f
Ottawa	B.	66.0	48	22 2 10	0	—	22 10 44	- 12	22 23 36	—	
Pulkovo	G.	69.7	343	22 2 25	- 7	22 4 59	22 11 19	- 18	22 23 0	—	h
Washington	W.	70.1	53	22 2 54	+ 17	—	22 11 36	- 10	—	—	i
	W.	70.1	53	22 2 36	+ 1	—	22 11 53	+ 7	22 25 14	22 36 47	j
Harvard Univ.	N.	70.5	47	22 3 5	+ 26	—	22 13 26	+ 95	22 35 37	—	
E.	B.O.	70.5	47	22 2 37	- 2	—	—	—	—	—	
Tashkent	G.	70.7	311	22 2 36	+ 4	k	22 11 50	- 3	22 25 0	22 27 40	
	G.	70.7	311	22 2 44	+ 4	i 5 16	22 12 0	+ 7	—	—	l
Calcutta	N.	73.4	285	22 3 0	+ 3	—	—	—	22 39 ?	22 38 6	
E.	O.E.	73.4	285	22 3 12	+ 15	—	22 12 42	+ 16	22 29 12	22 18 0	
Dyce, Aberdeen	Ma.	74.3	360	—	—	—	—	—	22 13 0	22 38 6	
Edinburgh	M.	75.6	359	22 5 0	+ 108	—	—	—	—	22 18 0	
Eskdalemuir	G.	76.2	359	—	—	—	—	—	—	—	
Makeyevka	G.	77.6	334	22 3 35	+ 11	22 6 26	? 12 46	- 12	—	—	m
Stonyhurst	M.	77.7	359	22 2 0	- 84	—	22 13 2	- 13	22 27 0	—	o
Bidston	N.	78.1	359	22 3 48	+ 21	—	—	—	—	22 45 36	
Kew	M.	80.0	359	22 14 0	? S	—	22 13 30	+ 10	—	22 37 18	
De Bilt	—	80.0	356	22 3 35	+ 1	—	22 14 0	+ 18	—	22 49 6	
Slide	M.B.	80.8	360	—	—	—	22 13 20	- 15	e 29 0	—	
Paris	—	82.7	357	v 4 3	+ 10	—	22 13 43	- 10	22 26 0	22 38 0	
	—	—	—	—	—	—	e 14 0	- 13	22 34 0	22 39 0	

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Batavia	W.	82.7	252	c	4	0	+ 7	—	?	12	36	— 97	—	22	16	0							
Tiflis	G.	82.9	327	22	3	28	— 16	22	6	47	22	13	33	— 19	22	30	0						
Padova	V.	85.4	351	22	4	9	— 0	—	—	—	22	14	27	— 15	—	22	44	45					
	V.	85.4	351	—	—	—	—	—	—	—	22	14	30	— 12	—	—	—	—					
Bombay	M.	85.8	294	—	—	—	—	—	—	—	—	—	—	—	—	22	43	53					
Riverview	W.	85.9	202	22	4	24	+ 12	—	—	—	22	15	9	+ 21	22	27	24	22	39	21			
Sydney	—	85.9	202	22	8	30	+ 258	—	—	—	—	—	—	—	22	15	8	22	40	18			
Moncalieri	S.	86.5	353	22	4	26	+ 11	—	—	—	22	14	19	— 36	22	23	24	—	—	—			
Rocca di Papa	Aga.	88.8	349	22	4	20	— 8	—	—	—	?	14	54	— 26	22	28	0	—	—	—			
Kodalkanal	M.	89.6	285	22	15	48	— ? S	—	—	—	22	15	48	+ 19	—	—	—	—	—	22	51	54	
Barcelona	Ma.	90.1	337	—	—	—	—	—	—	—	—	—	—	—	22	14	45	—	—	—	22	39	17
Colombo	M.	90.5	236	—	—	—	—	—	—	—	22	15	0	— 38	—	—	—	—	—	—	—	—	—
Adelaide	M.	90.7	212	—	—	—	—	—	—	—	—	—	—	—	22	15	30	—	—	—	22	43	36
Coimbra	M.	91.2	5	22	5	0	+ 19	—	—	—	22	15	42	— 3	22	29	15	—	—	—	22	33	0
	W.	91.2	5	22	5	13	+ 32	—	—	—	22	15	12	— 33	22	30	15	—	—	—	—	—	—
Azores	M.	91.2	19	22	14	6	— ? S	—	—	—	?	14	6	— 99	—	—	—	—	—	—	23	0	0
Melbourne	M.	91.3	206	22	15	24	— ? S	—	—	—	?	15	24	— 22	—	—	—	—	—	—	—	—	—
Malta	M.	94.5	317	22	7	0	+ 120	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Fernando	M.	95.0	4	22	4	30	+ 32	—	—	—	22	16	0	— 25	22	40	20	—	—	—	22	50	30
Helwan	N.	96.3	332	22	5	6	— 4	—	—	—	—	—	—	—	—	—	—	—	—	—	22	58	42
	E.	96.3	332	22	8	24	+ 194	—	—	—	22	15	48	— 50	—	—	—	—	—	—	22	58	6
La Paz	—	117.7	84	22	11	14	+ 262	—	—	—	22	24	8	+ 257	22	49	0	—	—	—	23	15	45
Mauritius	N.	125.0	279	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	23	10	18
	E.	125.0	279	22	12	54	+ 329	—	—	—	—	—	—	—	22	6	48	—	—	—	23	7	6
Capetown	M.	159.2	307	22	16	6	+ 381	—	—	—	—	—	—	—	22	58	6	—	—	—	23	25	0

NOTES.—*a*, MN 22h. 8m. 37s.; ME 22h. 10m. 37s. *b*, 50°1N. 177°5W. *c*, MN 22h. 15m. 2s.; ME 22h. 16m. 3s.
d, MN 22h. 20m. 50s.; ME 22h. 20m. 26s. *e*, *i*, 22h. 1m. 56s.; *i*, 22h. 5m. 30s. *f*, 49°3N. 178°9E.
g, L 22h. 23m. 30s. and 22h. 25m. 6s. *h*, SR, *g*; 22h. 13m. 0s. *i*, 22h. 32m. 21s. and 22h. 23m. 44s.
j, SR, 22h. 15m. 30s.; 48°8N. 173°2E. *k*, *i*, 22h. 4m. 3s. *l*, *i*, 22h. 7m. 24s.; *i*, 22h. 16m. 15s.;
e, 22h. 7m. 45s.; *e*, 22h. 20m. 0s.; 49°N. 184°E. *m*, M 22h. 37m. 42s. and 22h. 55m. 18s. *n*, MN 22h. 34m. 12s.;
ME 22h. 34m. 36s. *o*, PR, 22h. 8m. 5s.; SR, 22h. 18m. 3s.; 46°8N. 161°8E. *p*, SR, 22h. 19m. 22s.;
PR, 22h. 8m. 30s.; PS 22h. 14m. 28s. *q*, PS 22h. 15m. 34s. *r*, MN 22h. 53m. 17s.; ME 22h. 46m. 37s.
s, M 22h. 41m. 0s.; 22h. 53m. 14s., and 23h. 1m. 6s. *t*, MN 22h. 39m. 49s.; ME 22h. 40m. 53s.
u, *i* N 22h. 21m. 40s.

1916. February 14d. 10h. 1m. 31s.

Epicentre 5°0N. 128°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
				H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.		
Manila	W.	11.8	325	10 4 37	+ 10	—	—	10 7 18	+ 33	10 9 38	—	
Batavia	W.	23.9	243	c 8 0	+ 62	—	—	—	—	—	10 14 0	a
Zi-ka-wei	W.	26.9	347	10 7 33	—	—	—	e 12 5	- 5	—	—	b
	W.	26.9	347	10 7 33	+ 5	—	—	2 12 25	+ 15	—	—	—
Osaka	O.	30.5	12	10 8 33	+ 29	—	—	10 14 38	+ 84	10 19 28	—	c
Mizusawa	N.	36.1	17	10 8 34	+ 0	—	—	10 14 41	- 1	—	—	—
	R.	36.1	17	10 9 3	+ 9	—	—	10 14 41	- 1	—	—	—
Calcutta	N.	42.1	298	10 12 24	+ 161	—	—	—	—	—	—	—
	R.	42.1	298	10 12 0	+ 137	—	—	10 19 30	+ 203	10 27 24	—	—
	O.E.	42.1	298	10 12 0	+ 77	—	—	10 19 42	+ 181	10 27 0	10 30 30	d
Sydney	M.	44.6	152	10 11 18	+ 73	—	—	10 16 12	- 29	10 26 6	10 30 30	e
Riverview	W.	44.6	152	10 8 48	- 73	—	—	—	—	10 26 48	10 29 0	f
Melbourne	M.	45.6	161	—	—	—	e	—	—	—	10 12 0	—
Colombo	M.	48.0	275	—	—	—	—	—	—	—	10 24 6	—
Kodaikanal	M.	50.3	279	10 7 54	- 166	—	—	—	—	—	10 27 50	g
Irkutsk	G.	51.2	342	10 10 46	+ 1	10 12 51	—	10 18 8	+ 3	10 26 0	10 39 48	—
Bombay	M.	55.5	289	—	—	—	—	—	—	—	10 37 1	i
Tashkent	G.	63.8	314	10 12 7	+ 1	—	—	10 20 37	- 5	—	—	—
	G.	63.8	314	10 12 16	+ 8	—	—	—	—	—	—	—
Mauritius	E.	73.2	247	10 21 12	? S	—	—	? 21 12	- 83	—	10 40 48	—
Honolulu	M.	73.4	69	10 23 12	? S	—	—	10 23 12	+ 34	10 36 6	10 40 6	—
Ekaterinburg	G.	73.5	328	10 13 15	+ 5	—	—	10 22 40	+ 1	10 33 0	10 43 33	j
Tiflis	G.	81.6	311	10 15 0	+ 61	—	—	—	—	—	—	—
Makeyevka	G.	86.3	318	—	—	—	—	i 24 43	- 21	10 46 0	11 0 52	k
Pulkovo	G.	89.6	330	10 14 31	- 14	—	—	10 25 26	- 15	10 42 0	—	—
Helwan	N.	93.2	300	10 20 0	+ 296	—	—	—	—	—	—	—
	R.	93.2	300	10 18 0	+ 176	—	—	—	—	—	—	—
Edinburgh	M.	107.2	334	10 26 0	m	—	—	—	—	—	11 4 0	—
Eskdalemuir	G.	107.5	333	—	—	—	—	—	—	10 53 0	10 59 0	—
Bidston	N.	107.5	332	—	—	—	—	10 27 24	- 73	—	11 3 24	—
Stonyhurst	M.	108.1	332	10 29 30	? S	—	—	10 29 30	+ 48	—	11 15 12	—
Paris	—	108.3	326	—	—	—	—	—	—	10 58 0	—	—
Shide	M.S.	109.4	329	—	—	—	—	—	—	—	11 4 0	—
	M.B.	109.4	329	—	—	—	—	—	—	—	11 4 0	—
Granada	C.	118.3	317	—	—	—	—	e 53 18	o	11 3 36	11 18 12	—

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Coimbra	M.	119.6	323	---	---	---	10 53 50	<i>o</i>	11 4 52	11 11 24	<i>p</i>
San Fernando	M.	120.5	318	---	---	---	---	---	11 9 15	11 19 0	
Ottawa	B.	125.4	20	---	---	? 32 37	i 35 22	+262	? 55 24	---	<i>q</i>
Toronto	M.	125.5	24	---	---	---	---	---	10 42 48	11 35 42	
La Paz	---	160.5	127	10 21 53	+ 112	---	10 32 56	- 73	10 46 0	11 24 15	

NOTES.—*a*, MN 10h. 12m. 4s.; ME 10h. 12m. 49s. *b*, MN 10h. 19m. 33s.; ME 10h. 18m. 26s. *c*, MN 10h. 20m. 40s.;
ME 10h. 26m. 28s. *d*, SR 10h. 19m. 31s. *e*, PR₁ 10h. 15m. 54s. *f*, PS 10h. 19m. 24s.
g, PS 10h. 20m. 36s.; i 10h. 10m. 58s.; 4° 2' N. 127° 0' E. *h*, L *circa* 10h. 32m. 0s. *i*, Epicentre from P₁
17° 4' N. 138° 5' E.; from P₂ 2° S. 121° E. *j*, 4° 1' N. 125° 1' E. *k*, P approximate.
10h. 34m. 10s. *m*, O-C +584s. *n*, MN 11h. 2m. to 3m. *o*, S times doubtful.
p, e 10h. 38m. 45s. *q*, SR? 10h. 43m. 51s.

1916. February 15d. 11h. 35m. 52s.

Epicentre 61°5N. 145°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁			S.	O-C.	L.			M.	Notes Ref.			
				H.	M.	S.	S.	H.	M.	S.	S.	H.	M.	S.	H.	M.		S.		
Victoria, B.C.	M.	17.9	127	11	40	6	- 2		11	43	48	+ 18	11	45	48	11	46	48		
Berkeley	---	27.5	139	c	41	40	- 15													
Lick	W.	28.5	138	c	42	58	+ 53													
Honolulu	M.	41.2	199	11	49	18	? S				? 49	18	- 58	11	55	12	11	51	32	
Toronto	M.	41.5	84	b	45	48	- 3				11	50	23	- 5	11	53	42	11	56	48
Ottawa	B.	41.9	80	11	43	59	+ 109				11	50	18	- 2	11	53	42	12	1	0
Washington	N. W.	46.3	86	11	43	30	- 64	11	45	36	11	51	19	- 5	12	0	10	12	1	4
	E. W.	46.3	86	11	43	35	- 59				11	51	20	- 4				12	1	4
Harvard Univ.	N. B.O.	46.3	79				- 70				? 50	35	- 49	11	55	32	12	1	38	
	E. B.O.	46.3	79	11	43	24	- 70				11	51	26	+ 2	11	55	24	12	0	1
Irkutsk	G.	53.7	315	11	45	16	+ 7	11	47	20	11	52	52	- 5	12	12	2	13	10	36
Osaka	O.	55.2	280	11	53	1	? S				11	53	1	- 15						
Dyce, Aberdeen	Ma.	57.8	23	? 8	0		? S				? 9	0	- 9	12	11	0	12	13	0	
Paisley	---	58.7	25	11	53	30	+ 4				11	53	30	+ 29				12	16	0
Pulkovo	G.	58.7	3	11	45	59	+ 4	11	48	32	11	54	8	+ 9	12	2	0	12	9	0
Eskdalemuir	G.	59.4	24				- 4				? 54	25	+ 17	12	3	0	12	9	0	
Edinburgh	M.	59.4	24	11	48	0	+ 120											12	15	0
Ekaterinburg	G.	60.0	344	11	46	9	+ 5				11	54	21	+ 6	12	4	0	12	14	5
Kew	M.	63.6	24	11	54	24	? S				11	54	24	- 36				12	7	30
Shide	M.S.	64.1	25				-											12	17	0
	M.B.	64.1	25				-											12	17	0
De Bilt	---	64.4	20				-				11	55	32	+ 22	12	7	0			
Zi-ka-wei	W.	64.6	289				-				11	55	12	0						
	W.	64.6	289	11	46	26	- 8				11	55	2	- 10						
Azores	M.	69.4	48	11	58	24	? S				11	58	24	+ 133				12	28	18
Makeyevka	G.	70.5	358	11	47	31	+ 19				11	56	34	+ 10	12	8	0	12	20	26
Moncalieri	S.	71.3	20	? 43	51		- 206				? 50	26	- 368	11	56	21				
Coimbra	M.	72.4	33	11	57	18	n				12	2	0	+ 313	12	14	54	12	19	40
	W.	72.4	33	11	57	10	o				12	1	49	+ 302	12	12	30			
Tashkent	G.	73.6	334	11	47	24	- 8				11	57	0	- 1	12	12	0	12	17	5
	G.	73.6	334	11	47	45	+ 13				11	57	43	+ 42				12	25	12
Rocca di Papa	Aga.	75.1	17				-				11	54	0	- 199						
Monte Cassino N.	V.	75.6	16				-													
San Fernando	M.	76.5	33	11	48	r	+ 67				11	58	0	+ 25	s					t

21

Granada	C.	76.5	31	11 46 44	- 66	---	---	---	---	---	---	---
	C.	76.5	31	11 46 54	- 56	---	11 56 38	- 57	12 8 0	12 14 54	<i>u</i>	
Manila	W.	79.1	218	---	---	---	<i>e</i> 56 0	-125	---	---	---	
Calcutta	N.	O.E.	85.8	312	12 22 36	<i>v</i>	---	---	12 29 18	---	---	
	E.	O.E.	85.8	312	---	---	---	---	12 28 48	---	---	
Helwan	N.	M.	88.6	3	11 50 0	+ 60	---	---	---	---	---	
	E.	M.	88.6	3	11 54 0	+ 300	---	---	---	---	---	
Bombay	M.	---	94.0	324	12 25 2	<i>w</i>	---	---	---	---	12 37 2	
La Paz	---	---	98.4	105	11 53 3	+ 189	---	---	---	---	12 38 30	
Kodaikanal	M.	---	101.1	317	12 31 48	<i>x</i>	---	---	---	---	12 41 6	
Riverview	W.	---	108.4	252	---	---	<i>c</i> 2 24	- 42	12 31 54	---	12 36 16	<i>y</i>
Melbourne	M.	---	114.2	235	12 11 6	<i>z</i>	---	---	---	---	12 12 0	
Adelaide	M.	---	114.4	241	12 3 12	? S	---	---	---	---	12 41 36	
Mauritius	E.	M.	135.6	328	12 43 24	<i>aa</i>	---	---	---	---	12 53 54	

NOTES.—*a*, MN 11h. 50m. 28s.; ME 11h. 50m. 11s. *b*, The time for P has ? *c*, SR₂ 11h. 53m. 52s.
d, PS 11h. 57m. 13s., 56°2N. 154°9W. *e*, MN 12h. 14m. 4s.; ME 12h. 13m. 16s. *f*, O-C +1330s.
g, O-C +912s. *h*, M 12h. 6m. 48s. and 12h. 6m. 57s. *i*, SR 11h. 58m. 36s., 61°N. 150°W.
j, SR₁ 11h. 58m. 27s. *k*, SR₁ 11h. 58m. 29s.; *i*₁ 11h. 49m. 52s.; *i*₂ 11h. 56m. 1s.; 59°3N. 152°2W.
l, MN 12h. 18m. 7s.; ME 12h. 16m. 44s. *m*, MN 12h. 2m. 24s.; ME 12h. 24m. 14s. *n*, O-C +594s.
o, O-C +586s. *p*, MN 12h. 18m. 45s.; ME 12h. 18m. 51s. *q*, *i* 11h. 50m. 18s.; *e*₁ 11h. 55m. 0s.;
*e*₂ 12h. 2m. 30s. *r*, 52s.? *s*, L 12h. 21m. 15s. *t*, ME 12h. 24m. 0s.; MN 12h. 26m. 30s.
u, 50°4N. 165°6W. *v*, O-C +2032s. *w*, O-C +2132s. *x*, O-C +2500s. *y*, *e* 12h. 19m. 12s.
z, O-C +1197s. *aa*, O-C +3040s.

1916. February 20d. 17h. 47m. 35s.

Epicentre 51°0N. 169°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O - C.	P ₁			S.	O - C.	L.			M.	Notes Ref.		
				H.	M.	S.	S.	H.	M.	S.	H.	M.	S.	H.	M.	S.			
Victoria, B.C.	M.	29.2	77	17	53	54	- 1	17	53	54	?	P	17	58	6	18	15	0	
Honolulu	M.	30.9	160	17	54	12	0	---	---	---	---	---	18	1	42	18	2	18	
Berkeley	---	35.2	95	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Lick	---	36.1	94	---	---	---	10	---	---	---	---	---	---	---	---	---	---	---	
Mizusawa	N.	36.4	269	17	54	58	- 2	---	---	18	0	44	- 7	---	---	---	---	b	
	E.	36.4	269	17	54	58	- 2	---	---	18	0	44	- 7	---	---	---	---	---	
Osaka	O.	42.7	269	17	55	56	+ 5	---	---	18	2	26	+ 7	18	7	34	---	c	
Irkutsk	G.	50.5	308	17	56	42	- 3	17	58	42	18	4	6	18	14	0	18	20	32 d
Zi-ka-wai	N.	53.8	276	17	57	14	+ 7	---	---	18	4	54	+ 13	---	---	---	---	e	
	E.	53.8	276	---	---	---	---	---	---	18	4	53	+ 12	---	---	---	---	---	
	Z.	53.8	276	---	---	---	---	---	---	18	4	43	+ 2	18	15	9	---	---	
Toronto	M.	57.3	59	---	---	---	---	---	---	18	5	12	+ 13	18	13	18	18	26	18
Ottawa	B.	58.1	56	---	---	---	---	---	---	18	5	19	- 16	---	---	---	---	---	
Washington	E.	61.7	62	17	57	32	- 3	---	---	18	5	26	- 9	18	15	24	---	---	
	N.	61.7	62	17	57	52	- 6	---	---	18	6	17	- 2	18	15	58	---	---	
	E.	61.7	62	17	57	55	- 3	---	---	18	6	22	+ 3	18	15	28	---	---	
Harvard Univ.	N.	62.6	56	17	58	15	+ 11	---	---	---	---	---	---	---	---	---	---	---	
	E.	62.6	56	17	58	6	+ 2	---	---	18	6	10	- 21	18	13	16	---	---	
Ekaterinburg	G.	64.7	332	17	58	19	+ 1	18	2	12	18	7	4	18	17	0	18	31	13 f
Manila	W.	66.2	264	17	58	54	+ 27	---	---	---	---	---	+ 24	18	16	26	---	g	
Pulkovo	G.	68.2	350	17	58	38	+ 3	---	---	---	---	---	- 4	18	17	0	18	36	26 h
Dyce, Aberdeen	Ma.	71.3	8	17	59	5	+ 5	---	---	---	---	---	+ 3	18	22	50	18	34	0 i
Falsley	M.	72.4	9	18	1	0	+ 13	---	---	---	---	---	---	---	---	---	---	---	
Edinburgh	M.	72.5	8	18	0	0	+ 52	---	---	---	---	---	---	---	---	---	---	---	
Eskdalemuir	G.	73.0	8	17	59	7	- 4	---	---	18	8	23	- 14	18	24	0	18	27	0 k
Stonyhurst	M.	74.6	8	---	---	---	---	---	---	18	8	30	- 26	---	---	---	---	---	
Taskhent	G.	74.7	318	17	59	24	+ 2	---	---	18	9	0	+ 3	18	25	0	18	31	33 l
	G.	74.7	318	17	59	33	+ 11	---	---	18	9	6	+ 9	---	---	---	---	---	
Bidston	N.	75.4	9	17	58	24	- 62	---	---	18	9	6	+ 1	---	---	---	---	---	
De Bilt	M.S.	76.5	6	17	59	32	- 3	---	---	18	9	14	- 8	e	22	0	---	---	
Kew	M.	77.1	7	18	9	0	+ 8	---	---	---	---	---	---	---	---	---	---	---	
Slide	M.S.	77.8	8	17	59	19	+ 19	---	---	---	---	---	- 10	---	---	---	---	---	
	M.B.	77.8	8	18	0	0	+ 19	---	---	---	---	---	- 10	18	27	0	18	37	30
Makeyevka	G.	78.3	342	17	59	42	- 2	18	4	34	18	9	39	18	18	0	18	37	28

Paris	—	80-0	6	17 59 48	—	6	—	18 9 46	—	12	18 20 0	<i>m</i>
Calcutta	O.E.	80-2	294	18 8 24	—	? S	—	? 8 24	—	96	18 35 48	18 37 36
Padova	V.	83-6	359	18 0 10	—	5	—	18 10 36	—	3	18 18 18	18 45 40
Moncalieri	S.	84-0	2	18 0 8	—	9	—	18 10 10	—	38	18 21 50	<i>n</i>
Azores	M.	85-7	28	18 7 0	—	o	—	—	—	—	—	18 11 18
Barcelona	Ma.	87-2	7	18 0 41	—	+	6	—	—	—	—	18 44 0
Rocca di Papa	Aga.	87-2	359	18 0 32	—	+	3	—	—	—	—	18 49 30
Coimbra	M.	87-3	15	—	—	—	—	—	—	—	—	18 28 40
	W.	87-3	15	18 0 27	—	—	9	—	—	—	—	<i>q</i>
Granada	C.	90-9	12	18 0 50	—	—	6	—	—	—	—	—
San Fernando	N.	M.	91-2	14	17 56 30	—	267	—	—	—	—	18 44 30
	E.	M.	91-2	14	17 55 0	—	357	—	—	—	—	18 46 0
Batavia	W.	91-2	262	—	—	—	—	—	—	—	—	18 12 0
Bombay	M.	91-7	303	18 11 14	—	? S	—	—	—	—	—	18 46 52
Sydney	M.	91-8	212	18 11 0	—	? S	—	—	—	—	—	—
Riverview	W.	91-8	212	18 1 1	—	0	—	—	—	—	—	—
Kodaikanal	M.	96-3	295	18 12 24	—	? S	—	—	—	—	—	18 35 15
Helwan	N.	M.	97-1	342	18 1 24	—	6	—	—	—	—	18 53 42
	E.	M.	97-1	342	18 3 6	—	96	—	—	—	—	18 59 18
Melbourne	M.	97-5	215	18 12 30	—	? S	—	—	—	—	—	18 52 36
Colombo	M.	97-6	291	—	—	—	—	—	—	—	—	18 16 0
	M.	97-6	291	—	—	—	—	—	—	—	—	18 52 0
La Paz	—	109-6	92	18 7 4	—	+ 274	—	—	—	—	—	18 57 30
Accra	—	122-7	13	18 13 30	—	? S	—	—	—	—	—	19 10 0

NOTES.—*a*, P also recorded as 17h. 50m. 36s. with O-C -199s. *b*, e 18h. 10m. 0s. *c*, MN 18h. 15m. 0s.; ME 18h. 16m. 42s.
d, SR₁ 18h. 11m. 39s.; PS 18h. 8m. 1s.; 50°-6N. 166°-4W. *e*, MN 18h. 19m. 26s.; ME 18h. 22m. 15s.; MZ 18h. 17m. 26s.
f, *i*₁ 18h. 6m. 55s.; *i*₂ 18h. 11m. 4s.; *i*₃ 18h. 11m. 17s.; *i*₄ 18h. 12m. 17s.; 49°-6N. 169°-3W. *g*, MN 18h. 39m. 50s.;
ME 18h. 39m. 44s. *h*, PS 18h. 8m. 35s.; SR₁ 18h. 12m. 23s.; SR₂ 18h. 15m. 18s.; 52°N. 168°W.
i, SR ? 18h. 16m. 40s. *j*, 18h. 38m. 0s. and 18h. 40m. 0s. *k*, 52°N. 162°E. *l*, *i*₁ 18h. 2m. 7s.;
*i*₂ 18h. 3m. 59s.; *e*₁ 18h. 5m. 18s.; *e*₂ 18h. 14m. 31s.; *e*₃ 18h. 17m. 48s.; epicentres 54°-8N. 202°-2E. and 52°N. 198°E.
m, MN 18h. 39m.-40m.; ME 18h. 30m.-31m. *n*, MN 18h. 46m. 53s.; ME 18h. 42m. 23s. *o*, O-C +393.
p, e 18h. 6m. 55s. *q*, MN 18h. 43m. 40s.; ME 18h. 39m. 47s. *r*, e 18h. 2m. 0s. *s*, PS 18h. 12m. 6s.
t, PR, 18h. 19m. 18s.; SR 18h. 29m. 18s.; SR₂ 18h. 33m. 36s.; S given as 18h. 24m. 54s. *u*, O-C +418s.

1916. February 27d. 20h. 20m. 36s.

Epicentre 10°5N. 91°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
				H. M. s.	s.	H. M. s.	H. M. s.	s.	H. M. s.	H. M. s.		
Washington	W.	31-0	21	20 27 15	+ 1	—	—	20 32 19	- 8	—	—	—
	W.	31-0	21	20 26 55	+ 19	—	—	20 32 27	0	20 33 52	20 39 0	—
	Ma.	31-0	21	20 27 15	+ 1	—	—	20 32 29	+ 2	—	—	—
Toronto	Ma.	31-0	21	20 27 33	+ 19	—	—	20 32 25	+ 2	—	—	—
	M.	34-7	15	α 30 0	+ 133	—	—	20 34 6	+ 39	20 37 6	20 42 12	—
	—	35-2	140	i 27 48	- 3	—	—	20 33 29	- 5	20 38 55	20 40 0	—
La Paz	—	36-3	25	20 28 0	0	20 29 20	—	20 33 44	- 6	? 35 0	? 39 58	—
Harvard Univ.	B.O.	37-3	18	20 28 13	+ 5	20 29 34	—	20 34 18	+ 14	20 38 30	20 42 42	—
Ottawa	N.	B.	37-3	18	20 28 10	+ 2	—	20 34 4	0	—	20 42 0	—
	E.	B.	37-3	18	20 28 10	+ 2	—	20 34 4	0	—	20 42 0	—
Lick	W.	38-2	319	20 α 14	+ 58	—	—	20 35 46	+ 89	—	N 46 49	—
Berkeley	N.	—	319	20 29 7	+ 44	—	—	20 35 31	+ 61	20 40 43	20 49 43	—
	E.	—	319	20 29 8	+ 45	—	—	20 35 35	+ 65	20 41 2	20 50 47	—
Victoria, B.C.	M.	46-5	331	20 32 24	+ 184	—	—	20 37 0	—	20 43 0	20 55 36	—
Azores	M.	64-2	53	20 32 0	+ 45	—	—	—	—	—	21 6 48	—
Honolulu	M.	64-9	289	20 32 36	+ 76	—	—	—	—	20 53 12	20 56 42	—
Coimbra	M.	77-7	50	20 33 12	+ 31	—	—	20 41 51	- 42	20 53 24	b	—
	W.	77-7	50	20 32 24	—	—	—	N 41 38	- 55	—	d	—
Ascension	W.	77-7	50	20 32 24	- 17	—	—	E 42 8	- 25	E 56 2	—	—
Paisley	M.	78-5	101	20 33 0	+ 14	—	—	—	—	—	21 34 0	—
San Fernando	M.	79-4	35	20 35 30	+ 159	—	—	—	—	—	21 8 0	—
N.	M.	79-6	55	20 33 30	+ 37	—	—	20 43 0	+ 5	20 58 0	21 4 30	—
	E.	M.	79-6	55	20 34 0	+ 67	—	20 44 30	+ 95	20 58 0	21 7 0	—
Eskdalemuir	G.	80-1	35	20 33 4	+ 8	—	—	? 42 46	- 14	20 57 43	20 59 0	e
Bidston	N.	M.S.	80-4	37	20 33 12	+ 15	—	20 43 12	+ 8	—	—	—
Stonyhurst	M.	80-8	37	20 33 0	0	—	—	20 43 0	- 9	—	21 9 18	—
West Bromwich	M.	81-1	38	20 33 6	+ 4	20 36 10	—	e 43 11	- 1	20 57 35	—	—
Granada	C.	81-6	54	20 33 9	+ 5	—	—	20 42 59	- 20	20 48 0	21 0 0	—
Shide	M.S.	81-7	40	20 33 6	+ 1	—	—	20 43 7	- 12	—	21 0 30	—
Kew	M.B.	81-7	40	20 33 11	+ 6	—	—	20 43 11	- 8	—	21 0 30	—
	M.	82-3	39	20 32 54	- 14	—	—	—	—	—	21 8 54	—
Paris	—	84-4	41	20 33 29	+ 9	—	—	20 43 23	- 25	20 56 0	21 1 0	f
De Bilt	—	84-9	38	20 33 33	+ 9	—	—	20 44 14	+ 20	e 58 30	—	—
Barcelona	Ma.	85-4	49	20 33 21	- 5	—	—	—	—	20 44 11	20 49 46	—
Moncalieri	S.	88-7	44	20 33 40	- 5	—	—	20 43 51	- 45	20 50 24	g	—

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Acera	M.	89-7	85	20 34 30	+ 40	—	—	—	—	—	21 40 0
Padova	V.	91-4	43	20 33 56	- 3	—	20 44 36	- 28	—	—	21 13 54
Rocca di Papa	Aga.	93-0	47	20 34 8	0	—	? 44 54	- 27	20 51 24	—	21 21 0
Pompeii	O.A.	94-7	47	20 37 0	+ 162	—	20 46 0	+ 21	—	—	—
Pulkovo	G.	95-7	26	20 34 26	+ 3	20 38 12	20 45 20	- 29	21 0 0	—	21 11 20 <i>h</i>
Malta	M.	96-1	52	20 40 0	+ 334	—	—	—	—	—	21 8 0
Makeyevka	G.	107-1	33	—	—	—	—	—	—	—	21 15 56 <i>i</i>
Ekaterinburg	G.	108-7	16	20 35 28	0	—	—	—	20 56 0	—	21 18 36 <i>j</i>
Mizusawa	N.	110-7	319	20 40 6	+ 269	—	20 50 33	+ 3	—	—	—
	E.	110-7	319	20 40 55	+ 318	—	20 50 36	+ 6	—	—	—
Helwan	N.	111-5	52	20 40 0	+ 259	—	—	—	—	—	22 6 24
	E.	111-5	52	20 36 48	+ 67	—	—	—	—	—	21 37 12
Capetown	M.	112-0	122	20 39 30	+ 227	—	—	—	—	—	21 24 6
Tiflis	G.	113-9	35	—	—	—	—	—	—	—	21 19 10 <i>k</i>
Irkutsk	G.	115-9	350	20 36 12	+ 11	20 41 2	20 50 56	+123	21 2 0	—	21 24 56 <i>l</i>
Oskaka	O.	117-0	318	20 41 46	+ 341	—	20 58 14	<i>m</i>	21 13 32	—	—
Sydney	M.	118-7	237	20 41 36	+ 323	—	—	—	20 51 42	—	21 0 36
Riverview	W.	118-8	237	—	—	20 42 12	—	—	21 18 12	—	21 26 40 <i>o</i>
Melbourne	M.	123-1	232	20 42 48	+ 375	—	20 50 41	+ 85	21 18 12	—	20 44 36
Tashkent	G.	125-1	18	20 36 34	- 8	<i>i</i> ₁ 44 52	20 53 58	+235	21 <i>p</i> 0	—	—
	G.	125-1	18	20 40 40	+ 238	—	—	—	—	—	—
	G.	125-1	18	20 41 51	+ 309	—	—	—	—	—	—
	G.	125-1	18	20 43 22	+ 400	—	—	—	—	—	—
Zi-ka-wei	W.	128-0	324	20 40 40	+ 226	—	—	—	—	—	—
Adelaide	M.	128-8	233	20 44 0	+ 422	—	—	—	—	—	21 38 36
Manila	W.	139-5	308	—	—	—	—	—	—	—	—
Bombay	M.	146-6	29	20 44 15	+ 362	—	—	—	—	—	21 59 5 <i>u</i>
Calcutta	E.	O.E.	1	20 40 48	+ 153	—	—	—	—	—	21 46 6
Perth, W.A.	M.	147-2	225	20 41 30	+ 194	—	—	—	21 29 6	—	21 46 0
Mauritius	N.	M.	149-2	109	20 52 0	? <i>s</i>	20 52 0	- 29	21 33 40	—	21 38 48
	E.	M.	149-2	109	20 34 42	- 257	—	—	21 35 42	—	21 37 42
Colombo	M.	160-4	28	20 42 42	+ 217	—	—	—	—	—	—
Batavia	W.	161-9	282	—	—	—	—	—	21 6 0	—	<i>v</i> <i>w</i>

NOTES.—*a*, Time uncertain. *b*, M 20h. 59m. 3s. and 21h. 2m. 34s. *c*, *i* 44m. 17s. *d*, M 20h. 44m. 18s.; 20h. 58m. 44s. and 21h. 5m. 48s. *e*, *e* S? 20h. 42m. 26s.; SR, 20h. 48m. 0s. *f*, *i* 20h. 44m. 50s. and 20h. 49m. 15s. *g*, MN 21h. 9m. 25s.; ME 21h. 15m. 30s. *h*, *i* PS 20h. 46m. 54s.; SR, 20h. 52m. 12s.; 16° 58' 88" 2E. *i*, *c* 20h. 37m. 40s.; *i*₁ 20h. 37m. 28s.; *i*₂ 20h. 45m. 58s.; *i*₃ 20h. 48m. 57s. *j*, *i* 20h. 38m. 42s.; *i*₂ 20h. 39m. 52s.; *i*₃ 20h. 40m. 11s.; *i*₄ 20h. 43m. 16s.; *i*₅ 20h. 45m. 46s.; *i*₆ 20h. 46m. 24s.; *i*₇ 20h. 49m. 16s. *k*, *e*₁ 20h. 36m. 47s.; *e*₂ 20h. 41m. 6s.; *i*₁ 20h. 47m. 20s.; *i*₂ 20h. 51m. 10s.; *i*₃ 20h. 52m. 32s. *l*, = ISR, 20h. 57m. 40s. *m*, O-C +552s. *n*, MN 21h. 38m. 4s.; ME 21h. 40m. 43s. *o*, PS 20h. 52m. 20s. *p*, 20m.? *q*, M 21h. 29m. 9s. and 21h. 29m. 26s. *r*, *i*₂ 20h. 47m. 30s.; *i*₃ 20h. 49m. 18s.; *i*₄ 20h. 59m. 36s.; *e*₁ 20h. 52m. 0s.; *e*₂ 21h. 2m. 0s.; *e*₃ 21h. 7m. 0s.; *e*₄ 21h. 11m. 0s.; *e*₅ 21h. 13m. 0s. *s*, MZ 21h. 49m. 43s. and 21h. 53m. 22s. *t*, MN 21h. 44m. 56s.; ME 21h. 39m. 51s. *u*, *c* 20h. 40m. 48s. *v*, M 21h. 51m. 0s. and 22h. 9m. 0s. *w*, *e* 20h. 42m. 0s.

1916. March 12d. 3h. 23m. 52s.

Epicentre 45°0N. 16°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Padova	V.	2.9	277	3 24 33	- 4	---	3 25 6	- 26	---	---	
Monte Cassino N.	V.	3.8	206	3 25 0	+ 9	---	---	---	---	3 27 30	
Rocca di Papa	Aga.	4.0	218	3 24 55	+ 1	---	3 26 7	+ 25	---	3 26 42	
Moncalieri	S.	5.8	271	3 25 25	+ 4	---	3 36 31	0	3 26 55	a	
De Bilt	---	10.1	319	3 26 22	- 1	---	---	---	3 28 38	---	
Barcelona	Ma.	10.7	256	---	---	---	---	---	3 28 34	3 31 45	
Kew	M.	12.6	307	3 29 54	? S	---	3 29 54	+ 28	---	3 30 48	
Shide	M.S.	12.9	302	---	---	---	3 29 44	+ 10	---	3 32 0	
West Bromwich	M.	14.0	309	3 27 25	+ 7	---	3 29 38	+ 22	---	---	b
Bidston	M.S.	15.0	311	---	---	---	3 31 36	+ 72	---	3 33 24	
Makeyevka	G.	15.4	71	3 27 49	+ 13	---	3 30 42	+ 9	3 32 30	3 34 23	
Eskdalemuir	G.	16.0	317	---	---	---	---	---	3 31 0	3 33 0	
Edinburgh	M.	16.2	319	3 32 0	? S	---	? 32 0	+ 68	---	3 33 36	
Granada	C.	16.6	249	3 27 47	- 5	---	3 30 34	- 27	3 32 6	3 33 22	
Pulkovo	G.	17.1	25	3 28 0	+ 2	---	3 31 12	0	3 32 54	c	d
Colmbra	W.	18.5	260	---	---	---	---	---	3 33 50	---	e
San Fernando N.	M.	18.8	251	---	---	---	3 31 31	- 18	3 35 30	3 36 30	
Helwan	E.	19.3	136	3 29 0	+ 35	---	---	---	---	---	
Ekaterinburg	G.	20.9	51	3 30 11	- 8	---	3 35 14	- 10	3 39 0	3 42 58	
Tashkent	G.	38.4	76	---	---	---	e 37 8	- 28	3 43 0	3 48 37	
	G.	38.4	76	---	---	---	? 40 6	+150	---	---	
Irkutsk	G.	55.1	48	---	---	---	e ₂ 41 26	+ 12	3 52 0	3 55 23 f	
La Paz	---	97.5	254	---	---	---	---	---	4 18 0	---	

NOTES.—a, MN 3h. 28m. 55s; ME 3h. 28m. 5s. b, 45°N. 11°5E. c, M 3h. 33m. 28s. and 3h. 33m. 35s.
d, 45°2N. 16°0E. e, c 3h. 26m. 0s. f, e₁ 3h. 32m. 4s.

1916. March 18d. 0h. 55m. 46s.

Epicentre 42°5N. 144°0E.

Station and Component	Machine	Distance from Epicentre	Azimuth	P.		O-C.	PR ₁	S.		O-C.	L.	M.	Notes Ref.
				H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.			
Mizusawa	E. O.	4-0	34	0 57 1	+ 13	—	—	a 57 46	+ 10	—	0 57 46	—	
Osaka	O.	10-3	223	b 58 36	+ 15	—	—	b 0 46	+ 23	—	1 0 46	c	
Zi-ka-wei	W.	21-2	245	1 0 49	+ 8	—	—	1 4 35	+ 1	—	—	d	e
Irkutsk	G.	28-2	304	1 1 49	- 7	—	—	1 6 33	- 16	—	1 9 0	1 14 26	e
Manila	W.	34-3	222	1 2 43	- 10	—	—	1 7 50	- 41	—	1 12 28	f	
Ekaterinburg	G.	52-3	317	1 5 6	- 2	—	—	1 12 28	- 6	—	1 17 0	1 28 29	
Honolulu	M.	52-4	95	1 15 12	? 8	—	—	? 15 12	+157	—	? 20 0	1 25 12	
Tashkent	G.	53-8	296	1 5 56	+ 40	—	—	1 13 15	+ 23	—	1 23 0	1 26	g h
Batavia	W.	59-3	224	1 6 0	+ 7	—	—	—	—	—	—	1 15 0	
Pulkovo	G.	64-3	329	1 6 29	+ 3	—	i	1 15 1	- 2	—	1 26 0	1 35 54	j
Makoyevka	G.	68-5	316	1 7 1	+ 7	—	—	1 15 57	+ 3	—	1 33 0	1 39 36	
Edinburgh	M.	77-8	342	—	—	—	—	—	—	—	—	1 47 0	
Eskdalemuir	G.	78-3	342	1 7 57	+ 2	—	—	1 17 48	- 2	—	1 33 30	1 43 0	
De Bilt	—	79-0	336	—	—	—	—	1 17 56	- 12	—	—	—	
Kew	M.	81-0	338	—	—	—	—	—	—	—	—	1 48 0	
Shide	M.B.	82-0	339	—	—	—	—	—	—	—	—	1 42 0	
Moncalieri	S.	84-2	331	1 8 41	+ 12	—	—	1 18 43	- 13	—	1 40 36	—	k
Helwan	N. M.	84-8	307	1 19 0	? 8	—	—	1 19 0	- 3	—	—	—	
	E. M.	84-8	307	1 24 0	l	—	—	—	—	—	—	—	
Rocca di Papa	Aga.	85-0	326	1 8 31	- 3	—	—	1 18 48	- 17	—	1 50 24	—	
Toronto	M.	85-5	30	—	—	—	—	—	—	—	1 50 18	—	
Barcelona	Ma.	89-3	332	—	—	—	—	? 19 42	- 10	—	1 43 24	—	
Coimbra	W.	93-7	339	—	—	—	—	—	—	—	1 54 0	—	
Granada	C.	95-0	335	1 8 14	- 75	—	—	—	—	—	1 44 0	1 49 48	
San Fernando	E. M.	96-5	336	—	—	—	—	—	—	—	1 58 0	2 0 0	m
La Paz	—	142-2	57	1 15 31	+ 145	—	—	i 27 4	+ 2	—	2 19 0	—	

NOTES.—a, S time recorded as L. b, P and S times recorded as (PS) and L. c, MN 1h. 3m. 3s.; ME 1h. 3m. 5s.
d, MN 1h. 9m. 32s.; ME 1h. 9m. 26s.; MZ 1h. 9m. 59s. e, PSN 1h. 4m. 53s.; PSZ 1h. 4m. 55s.
f, MN 1h. 14m. 57s.; ME 1h. 15m. 27s. g, 57s. h, e 1h. 12m. 7 10s.; i, 1h. 15m. 31s.; j, 1h. 17m. 33s.
l, i PR₁ 1h. 10m. 29s. j, SR₁ 1h. 20m. 0s.; SR₂ 1h. 22m. 18s. k, MN 1h. 49m. 55s.; ME 1h. 50m. 48s.
l, O-C +927s. m, PE recorded as 1h. 48m. 0s.

1916. March 25-26d. 23h. 52m. 17s.

Epicentre 24°0N. 124°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
				H. M. S.	s.	H. M. S.	H. M. S.	s.	H. M. S.	H. M. S.	
Zi-ka-wei	W.	7.5	343	23 54 15	+ 4	—	23 56 0	+ 19	—	—	a
	W.	7.5	343	23 54 34	+ 23	—	23 56 7	+ 26	—	23 58 0	0
Manila	W.	9.8	197	e 54 55	+ 11	—	23 56 57	+ 16	23 59 49	—	b
Osaka	O.	14.6	40	23 56 20	+ 29	—	—	—	23 58 58	—	c
Mizusawa	O.	20.9	40	23 56 57	+ 12	—	—	—	—	—	—
Irkutsk	G.	32.0	337	23 58 47	— 17	23 59 2	0 0 45	- 13	—	—	—
Calcutta	N.	32.7	274	23 48 48	—	—	0 4 25	0	0 8 0	0 13 36	24
	E.	32.7	274	23 48 36	—	—	—	—	—	23 59 24	24
Batavia	W.	34.6	211	e 59 0	- 27	—	—	—	—	0 6 0	0
Kodaikanal	M.	46.4	260	0 8 0	? S	—	0 8 0	+ 10	—	—	—
Tashkent	G.	48.3	305	0 1 10	+ 3	—	0 8 17	+ 2	0 f 0	0 23 49	q
Ekaterinburg	G.	55.6	324	0 1 58	- 2	—	0 9 42	- 4	—	0 28 8	h
Riverview	W.	63.4	155	0 1 48	- 63	—	0 11 20	- 3	0 23 12	—	i
Makeyevka	G.	69.8	315	0 3 36	+ 3	0 6 42	0 12 45	+ 4	0 29 0	0 38 15	—
Honolulu	M.	71.1	74	0 13 12	? S	—	0 13 12	+ 16	0 25 24	0 33 36	—
Pulkovo	G.	71.2	326	0 3 42	+ 1	0 6 35	0 12 54	- 3	0 28 0	0 38 6	j
Mauritius	E.	78.0	241	0 34 0	+ k	—	—	—	—	0 36 54	—
Helwan	N.	80.4	298	0 9 0	+ 262	—	—	—	—	—	—
	E.	80.4	298	0 5 0	+ 22	—	—	—	—	—	—
De Bilt	—	87.2	327	—	—	—	—	—	—	—	—
Edinburgh	M.	88.4	333	0 41 0	l	—	e 16 5	+ 5	e 37 24	—	—
Rocca di Papa	Aga.	88.6	316	—	—	—	—	—	—	0 50 0	0
Eskdalemuir	G.	88.8	333	—	—	—	—	—	—	—	m
Stonyhurst	M.	89.5	332	—	—	—	—	—	—	0 49 0	0
Moncalieri	S.	89.9	327	—	—	—	—	—	—	0 51 0	0
Kow	M.	90.1	329	0 41 0	o	—	—	—	0 41 10	—	n
Bidston	N.	90.1	332	0 16 12	? S	—	0 16 12	- 20	—	0 51 24	24
Shide	M.S.	91.1	329	—	—	—	—	—	0 42 0	0 50 48	48
	M.S.	91.1	329	—	—	—	—	—	0 42 0	0 52 30	30
	M.E.	91.1	329	—	—	—	—	—	0 42 0	0 52 30	30
Barcelona	Ma.	95.3	320	—	—	—	—	—	—	0 57 0	p
Granada	C.	101.4	320	—	—	—	—	—	—	0 57 0	0
Coimbra	M.	102.0	325	0 4 27	- 127	—	0 15 45	- 161	0 37 0	0 49 42	42
San Fernando	N.	103.4	321	—	—	—	—	—	—	0 58 13	13
	E.	103.4	321	—	—	—	0 52 30	r	0 59 0	1 3 0	0
	M.	103.4	321	—	—	—	0 51 0	s	1 0 30	1 2 0	0

30

Ottawa	B.	108·2	14	—	—	—	—	—	—	—	—	—	
Azores	M.	112·0	334	1	2	18	—	—	—	—	—	—	
Harvard Univ.	B.O.	112·1	12	—	—	—	—	—	—	—	—	—	
La Paz	—	166·4	60	0	12	35	+	88	—	0	22	15	
												—179	
											1	36	0
											1	43	0

NOTES.—*a*, MN 23h. 58m. 12s.; ME 23h. 58m. 0s.; *d*, O-C -622s. *b*, MN 0h. 9m. 18s.; ME 0h. 9m. 42s.
c, MN 0h. 1m. 32s.; ME 0h. 3m. 42s. *e*, O-C -634s. *f*, 21m. *circa*.
g, *e*, 0h. 1m. 30s.; *c*, 0h. 12m. 0s.; *e*, 0h. 18m. 0s.; *i*, 0h. 11m. 13s.; 25°·6'N. 126°·0'E. *h*, *i*, 0h. 11m. 0s.;
i, 0h. 14m. 18s. *j*, MN 0h. 26m. 53s.; ME 0h. 27m. 46s.; MZ 0h. 30m. 54s. *j*, SR, 0h. 18m. 6s.;
PR, 0h. 8m. 7s.; SR, 0h. 21m. 0s.; 24°·0'N. 123°·0'E. *k*, O-C +1776s. *l*, O-C +2136s.
m, *c* 0h. 50m. 42s. *n*, M 0h. 48m. 57s. and 0h. 50m. 7s. *o*, O-C +2126s. *p*, *e* 0h. 46m. 40s.
q, *e* 0h. 43m. 0s. *r*, O-C +2025s. *s*, O-C +1935s. *t*, LN 0h. 53m. 36s.; LE 0h. 46m. 42s.
u, O-C +3174s. *v*, 0h. 50m. 49s., 0h. 55m. 43s.

1916. April 7d. 9h. 26m. 3s.

Epicentre 29°0S. 53°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Mauritius	N. M.	9.8	25	9 28 48	+ 18	---	9 30 48	+ 21	9 28 48	---	a
Seychelles	M.	25.0	4	9 35 0	? S	---	9 35 0	- 66	9 39 0	9 41 0	
Capetown	E. M.	30.1	252	9 32 6	- 26	---	9 33 54	- 225	9 37 6	9 52 6	
Colombo	M.	43.9	39	9 35 0	+ 32	---	9 41 0	- 4	9 47 0	b	
Kodaikanal	E. M.	45.5	34	9 41 36	? S	---	9 41 36	+ 11	9 41 48	9 51 36	
Bombay	E. M.	51.4	24	c	+ 14	---	9 42 30	- 9	---	9 53 11	
Perth, W.A.	E. M.	53.0	110	9 35 30	+ 1	---	9 43 15	+ 16	9 51 0	9 55 30	
Batavia	W.	55.1	77	9 35 44	+ 1	---	9 43 28	+ 3	---	f	
Calcutta	N. O.E.	61.5	37	9 36 48	+ 23	---	9 45 24	+ 39	9 56 12	9 59 48	
Accra	---	62.1	295	9 41 30	+ 301	---	---	---	---	10 3 28	
Helwan	N. M.	62.5	338	9 37 12	+ 40	---	9 46 24	+ 86	---	10 8 0	
	E. M.	62.5	338	9 37 0	+ 28	---	9 45 30	+ 32	---	10 6 42	
Ascension	M.	66.9	274	9 41 0	+ 240	---	---	---	---	10 6 0	
Adelaide	M.	70.2	120	9 37 24	+ 3	---	---	---	9 46 36	10 2 18	
Melbourne	M.	73.7	125	9 37 18	- 25	---	9 47 36	+ 23	10 0 36	g	
Malta	M.	74.5	328	9 44 0	i	---	---	---	---	10 14 0	
Makeyevka	G.	78.3	349	9 38 20	+ 8	---	9 48 26	+ 19	10 3 0	10 13 8	
Manila	W.	78.3	66	9 38 12	0	---	9 48 7	0	---	---	
Pompeii	N. O.A.	78.5	331	9 38 47	+ 34	---	9 50 30	+ 141	9 59 24	j	
	E. O.A.	78.5	331	9 38 45	+ 32	---	9 51 0	+ 171	10 16 30	---	
Sydney	M.	80.0	123	9 38 12	- 10	---	9 48 12	- 14	10 3 18	10 6 18	
Riverview	W.	80.2	123	9 38 20	- 3	9 41 7	9 47 54	- 34	9 58 48	10 6 44	
Rocca di Papa	Aga.	80.3	330	9 38 22	- 2	---	9 48 54	+ 24	10 0 18	10 25 30	
Padova	V.	83.4	332	9 38 48	+ 7	---	9 49 31	+ 27	10 0 20	10 23 42	
Barcelona	Ma.	84.9	324	9 38 37	- 13	---	9 49 19	- 2	10 2 59	k	
Moncalieri	S.	85.0	329	9 39 0	+ 9	---	9 49 30	+ 8	10 4 0	l	
Ekaterinburg	G.	86.0	4	9 38 56	0	---	9 49 14	- 19	10 0 0	10 21 1 m	
San Fernando	N. M.	86.2	316	9 39 48	+ 51	---	9 50 0	+ 25	10 9 0	10 21 0	
	E. M.	86.2	316	9 39 30	+ 33	---	9 48 0	- 95	10 5 0	10 20 0	
Zi-ka-wei	W.	88.3	52	9 39 14	+ 4	---	9 49 44	- 14	---	---	
	W.	88.3	52	9 39 14	+ 4	---	9 50 47	+ 49	---	o	
Coimbra	W.	90.0	318	9 39 20	+ 1	---	9 49 56	- 21	10 12 48	q	
	M.	90.0	318	---	---	---	---	---	---	r	
Pulkovo	G.	90.8	351	9 39 20	- 3	9 43 15	9 50 0	- 25	10 4 0	10 6 32 t	

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De Bilt			91.4	333	9 39 29	+ 3	9 43 26	9 50 10	- 21	c 4 18		
Irkutsk	G.		92.6	28	9 39 36	+ 3	9 43 1	9 50 8	- 36	10 4 30	10 10 38	
Shide	M.B.		93.2	329				9 50 31	- 19	10 5 0		
Bidston	N.	M.S.	95.8	330	9 36 6	- 225		9 44 12				
Stonyhurst	M.		97.2	331	9 39 57	- 1	9 44 4	9 50 35	- 56	10 13 0	10 31 0	e
Eskdalemuir	G.		95.8	330								
Edinburgh	M.		97.6	332	9 39 0	- 61						w
Azores	M.		99.6	308	9 44 24	+ 252					10 30 18	
Osaka	O.		100.1	57	9 40 26	+ 12		9 59 8		10 16 2		y
Mizusawa	N.	O.	106.1	54	9 45 2	+ 259		9 54 9	+ 73			
	E.	O.	106.1	54	9 45 4	+ 261		9 54 10	+ 74			
La Paz			107.6	239	9 44 6	+ 197	9 46 24	9 51 21	- 108	10 10 34	10 12 44	z
Harvard Univ.	B.O.		134.0	302	e 49 11	aa		10 0 31	+ 241			
Ottawa	B.O.		137.2	307								dd
Washington	W.		138.4	297								
Toronto	M.		140.0	305	9 45 36	+ 142		9 59 36	+ 149	10 13 30	10 51 48	
Honolulu	M.		150.6	276	9 46 54	+ 177		10 0 6	+ 124	10 22 0	10 47 42	
Victoria, B.C.	M.		160.5	360	10 4 23	ff				10 10 49	10 10 59	
Berkeley	N.		170.5	339	9 46 23	+ 77		9 58 48	- 24			
	E.		170.5	339				9 58 54	- 18			

Notes.—*a*, P and S recorded as LN and LE. *b*, M 9h. 53m. 48s. and 9h. 55m. 54s. *c*, P (9h. 35m. 33s.) *d*, given as PR.
e, eL 9h. 50m. 0s. *f*, M 9h. 45m. 0s. *g*, M 10h. 5m. 42s. and 10h. 8m. 30s. *h*, SR₁ 9h. 52m. 6s.;
SR₂ 9h. 55m. 42s. *i*, O-C +372s. *j*, MN 10h. 8m. 51s.; ME 10h. 9m. 0s. *k*, MN 10h. 18m. 24s.;
ME 10h. 15m. 14s. *l*, MN 10h. 23m. 45s.; ME 10h. 25m. 25s. *m*, i 9h. 49m. 33s. *n*, LZ 10h. 7m. 56s.
o, MN 10h. 12m. 56s.; ME 10h. 14m. 5s.; MZ 10h. 20m. 45s. *p*, PSN 9h. 50m. 8s.; PSE 9h. 50m. 13s.
q, MN 10h. 26m. 20s.; ME 10h. 16m. 0s. *r*, i 9h. 57m. 0s. *s*, M 10h. 15m. 35s. and 10h. 21m. 30s.
t, i₁ 9h. 49m. 47s.; i₂ 9h. 50m. 30s.; SR₁ 9h. 56m. 0s.; SR₂ 10h. 0m. 36s.; 25° 0s. 52° 0s. *u*, O-C -425s.
v, SR₁ 9h. 53m. 4s.; PR₁ 9h. 46m. 33s.; PR₂ 9h. 49m. 44s. *w*, M 10h. 28m. 0s. and 10h. 33m. 0s.
x, O-C +428s. *y*, MN 10h. 27m. 17s.; ME 10h. 25m. 35s. *z*, SR 9h. 54m. 24s.; i 10h. 3m. 49s.
aa, O-C +383s. *bb*, LE (10h. 21m. 13s.) *cc*, LE 10h. 2m. 24s.; 10h. 7m. 30s. and 10h. 12m. 0s.
dd, e 9h. 45m. 40s.; i 9h. 48m. 34s. *ee*, L 10h. 22m. 10s. and 10h. 59m. 30s. *ff*, O-C +1190s.

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U

1916. April 15d. 12h. 31m. 32s.

Epicentre 3°5S. 102°5E.

Station and Component.	Machius.	Distance from Epicentre.	Azimuth.	P.		O-C.		PR ₁		S.		O-C.		L.		M.		Notes Ref.			
				H.	M.	S.	S.	H.	M.	S.	H.	M.	S.	H.	M.	S.	H.		M.	S.	
Batavia	W.	5.1	123	12	32	51	0	—	—	12	33	41	-11	—	—	—	—				
Colombo	M.	24.9	294	—	—	—	—	—	—	12	41	36	+3	—	—	12	50	48			
Manila	W.	25.7	45	12	37	16	-1	—	—	12	41	47	-1	12	47	6	—	a			
Kodai kanal	E.	M.	28.5	299	12	38	30	+45	—	—	—	—	—	12	42	24	12	47	30		
Calcutta	N.	O.E.	29.5	333	12	37	54	-1	—	12	42	54	-4	12	54	12	—	12	57	42	
Perth, W.A.	E.	M.	31.1	158	12	38	10	-1	12	42	0	—	—	12	47	0	—	12	58	50	
Bombay	M.	36.8	308	12	39	42	+42	—	—	—	—	—	—	—	—	—	—	12	54	56	
Zi-ka-wei	Z.	W.	39.1	26	12	39	16	-3	12	41	36	12	45	9	-17	12	49	12	12	57	26
	W.	39.1	26	12	39	16	-3	—	—	—	12	45	16	-10	12	49	16	—	12	57	32
Mauritius	N.	M.	46.5	245	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	55	36
Osaka	O.	49.2	36	12	40	36	+3	—	—	12	53	25	+344	13	2	3	—	—	—	—	—
Melbourne	M.	51.8	137	12	44	0	+189	12	48	0	12	51	18	+185	13	10	0	13	14	0	c
Tashkent	G.	54.1	329	12	41	8	+2	c ₁	13	12	12	48	50	+8	12	59	0	—	—	—	—
Riverview	W.	54.5	130	12	41	6	-2	—	—	—	12	48	30	-17	12	56	54	13	2	10	e
Sydney	E.	M.	54.5	130	12	36	0	-308	—	—	—	—	—	+31	13	0	18	13	5	30	
Mizusawa	N.	O.	55.5	36	12	41	20	+5	—	—	—	—	—	+21	—	—	—	—	—	—	
	E.	O.	55.5	36	12	41	20	+5	—	—	—	—	—	+12	—	—	—	—	—	—	
Tiflis	G.	69.1	317	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Ekaterinburg	G.	69.1	337	12	42	47	+3	i	45	24	12	51	58	+11	13	3	0	13	17	34	g
Helwan	N.	M.	75.5	302	12	45	54	+150	—	—	12	53	36	+32	—	—	—	13	16	48	
	E.	M.	75.5	302	12	43	12	-12	—	—	12	53	24	+20	—	—	—	13	18	54	
Makeyevka	G.	76.0	321	12	43	27	0	—	—	—	12	53	10	+1	13	8	0	13	24	13	
Capetown	E.	M.	83.1	236	12	54	18	—	—	—	12	54	18	-12	—	—	—	13	18	30	
Pulkovo	G.	84.3	331	12	44	12	—	—	—	—	12	54	40	-3	13	12	0	13	26	42	h
Rocca di Papa	Aga.	92.2	312	? 54	18	—	? 4	i	47	30	12	54	18	-110	—	—	—	13	13	12	i
Moncalieri	S.	95.9	315	—	—	—	—	—	—	—	12	56	15	-32	13	22	52	—	—	—	
De Bilt	—	97.3	322	—	—	—	—	—	—	—	12	55	54	-67	—	—	—	—	—	—	
Honolulu	M.	100.2	69	12	56	48	—	—	—	—	12	56	48	-42	13	21	0	13	39	18	
Kew	M.	100.7	322	12	58	0	—	—	—	—	12	58	0	+26	—	—	—	13	47	18	
Shide	M.S.	101.4	321	12	47	13	+24	—	—	—	12	56	9	-92	13	23	0	13	43	0	
	M.B.	101.4	321	12	47	13	+24	—	—	—	12	56	9	-92	13	23	0	13	43	0	
Stonyhurst	M.	101.6	324	—	—	—	—	—	—	—	12	58	42	+52	—	—	—	13	41	42	
Eskdalemuir	G.	101.8	326	12	57	5	? 6	—	—	—	12	57	5	-40	—	—	—	—	—	—	
Birston	N.	M.S.	102.1	324	12	56	24	? 6	—	—	12	56	24	-84	—	—	—	13	42	0	o

FC

San Fernando N.	M.	107-1	307	13	2	0	?	—	—	—	—	—	—	—	—	—	—	—	—	14	2	0
Coimbra	M.	107-1	307	12	59	0	?	S	—	—	—	—	—	—	—	—	—	—	—	13	42	0
Victoria, B.C.	W.	108-2	312	?	57	40	m	ie	0	11	12	59	0	+26	13	35	0	—	—	13	45	20
Azores	M.	120-4	34	13	33	37	p	—	—	—	13	39	37	q	—	—	—	—	—	13	51	7
Ottawa	M.	121-7	313	13	8	42	r	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toronto	B.	138-0	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Harvard Univ.	M.	139-8	2	?	11	12	u	—	—	—	—	—	—	—	—	—	—	—	—	13	51	18
La Paz	B.O.	140-7	352	—	—	—	—	—	—	—	i	2	24	-16	—	—	—	—	—	14	5	36
	—	158-0	24	12	51	57	+124	—	—	—	13	6	17	+136	—	—	—	—	—	13	47	0

NOTES.—*a*, MN 12h. 55m. 8s.; ME 12h. 55m. 43s. *b*, MN 13h. 6m. 17s.; ME 13h. 8m. 4s. *c*, SR, 12h. 58m. 54s.; SR₂ 13h. 4m. 6s. *d*, M 13h. 2m. 52s. and 13h. 5m. 15s. *e*, 5^h-6s. 100°-5E. *f*, 13h. 27m. 36s. and 13h. 31m. 32s. *g*, SR₁ 12h. 56m. 22s. *h*, i PR₂ 12h. 49m. 40s.; i 12h. 54m. 34s.; SR₁ 13h. 0m. 12s.; SR₂ 13h. 3m. 48s.; SR₃ 13h. 5m. 30s.; 1st 105°-6E. *i*, i 12h. 57m. 30s. *j*, 13h. 33m. 54s. and 13h. 36m. 35s. *k*, MN 13h. 25m. 14s.; ME 13h. 36m. 26s. *l*, O-C + 944s. *m*, O-C + 679s. *n*, O-C + 463s. *o*, S given as 13h. 5m. 0s. *p*, O-C + 2781s. *q*, O-C + 2353s. *r*, O-C + 1279s. *s*, 1 E 13h. 44m. 30s. *t*, i 12h. 53m. 34s., i 13h. 5m. 7s., 13h. 23m. 0s., and 13h. 39m. 59s. *u*, O-C + 1350s. *v*, L 13h. 52m. 9s., 13h. 54m. 42s., and 14h. 17m. 22s. *w*, e? 12h. 51m. 17s.

d2

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1916. April 18d. 4h. 1m. 39s.

Epicentre 55°0N. 169°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
				H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.		
Victoria, B.C.	M.	28-5	85					4 12 1	- 46			
	M.	28-5	85	4 7 36	- 16			4 8 34	-253	4 12 1	4 16 56	
Honolulu	M.	34-7	162	4 7 24	- 86					4 13 42	4 16 6	
Berkeley		35-6	99	4 8 40	- 17			i 14 17	- 26	c 16 58	4 18 45	
Mizusawa	N.	36-5	266	4 8 32	- 33			4 13 56	- 60			
	O.	36-5	266	4 8 31	- 34			4 14 51	- 5			
Lick	E.	36-6	100	N 8 48	- 18			N 14 28	- 29	N 17 30		a
Osaka	O.	42-8	266	4 9 32	- 24			4 14 58	- 86	4 19 0		b
Zi-ka-wei	W.	53-4	267	4 10 51	- 17			4 17 51	- 49		N 28 27	c
	W.	53-4	267	Z ₁ 10 58	- 10		Z 13 56	Z 17 58	- 42			
Toronto	M.	55-4	61	4 11 24	+ 183			4 19 12	+ 7	4 29 48	4 40 42	
Ottawa	B.	55-9	58	4 11 23	- 1			4 19 13	+ 1	4 28 6	4 33 42	
Washington	W.	60-1	64		- 2			4 20 0	- 3	4 28 56		d
	W.	60-1	64	4 11 50	- 2			4 20 1	- 2	4 28 32	4 34 32	
Harvard Univ. N.	B.O.	60-4	57	4 11 54	- 0	4 14 25		4 20 7	- 0	4 34 0		e
Ekaterinburg	G.	61-1	332	4 11 56	- 3			4 20 8	- 8		4 39 17	h
Pulkovo	G.	64-2	349	4 12 19	+ 1	4 15 21		4 20 53	- 1	4 31 0	4 34 14	i
Manila	W.	66-6	263	c 12 19	+ 15			4 17 32	-232			
Dyce, Aberdeen	Ma.	67-3	8	4 12 42	+ 3	i 13 22		4 17 17	-256	4 19 32	4 21 40	
Edinburgh	M.	68-5	9	4 15 0	+ 133						4 34 0	
Eskdalemuir	G.	69-0	9	4 12 52	+ 2						4 36 0	
Stonyhurst	M.	70-6	8		- 1			4 21 54	+ 1		4 51 36	j
Bidston	N.	70-9	9	4 13 0	- 1						4 50 42	
Kew	M.	73-1	7	4 22 0	? S			4 22 18	+ 2		4 35 54	
De Bilt	E.	73-5	4	4 13 17	- 1	N 16 46		4 22 0	- 42	i 33 18		
Shide	M.S.	73-8	8	4 13 48	+ 28			4 22 43	+ 4			
	M.B.	73-8	8		- 1			4 22 48	+ 2			
		73-8	8		- 1			4 22 43	+ 2			
Makeyevka	G.	74-5	342	4 13 22	- 3							
Calcutta	N.	78-5	293	4 13 48	- 1			4 23 18	- 27			
Tiflis	G.	79-1	335		- 1					? 43 0		
Padova	V.	79-6	359	4 13 51	- 5			4 24 53	- 5			
Moncalieri	S.	80-0	2	4 13 43	- 15			i 23 50	+ 12	4 35 32		k
Barcelona	Ma.	83-2	7	4 14 14	- 2			4 24 20	- 18	4 37 10		
Rocca di Papa	Aga.	83-2	359	4 14 6	- 10			4 24 15	- 23	4 37 12		

Monte Cassino	E.	V.	83.4	358	4 14 15	--	2	---	---	---	4 25 20	
Coimbra		W.	83.4	15	4 14 16	--	2	---	---	---	---	m
Pompeii		O.A.	84.2	357	4 14 30	+	8	---	---	4 24 24	- 16	---
San Fernando	N.	M.	87.3	14	---	---	---	---	---	4 24 20	- 29	---
	E.	M.	87.3	14	4 15 30	+	50	---	---	---	---	4 25 0
Bombay	E.	M.	89.5	303	4 14 32	---	20	---	---	---	---	4 25 30
Batavia		W.	91.7	262	c 15 0	---	4	---	---	---	---	4 41 30
Helwan	N.	M.	93.3	342	4 14 54	---	19	---	---	---	---	4 54 45
	E.	M.	93.3	342	4 16 42	+	89	---	---	---	---	4 28 0
Sydney	E.	M.	95.1	212	---	---	---	---	---	---	---	4 27 24
Riverview		W.	95.2	212	4 14 48	---	35	---	---	---	---	4 26 30
Kodakanal	E.	M.	95.5	295	4 25 6	p	---	---	---	4 25 8	- 99	4 25 18
Colombo		M.	96.1	291	4 19 0	+	211	---	---	4 26 42	- 8	4 43 18
Adelaide		M.	100.5	221	4 19 0	+	188	---	---	---	---	4 27 24
Melbourne		M.	100.8	215	4 26 30	? S	---	---	---	---	---	4 27 0
La Paz		---	109.7	89	4 18 25	+	110	---	---	4 26 30	- 72	4 33 42
Ascension		M.	128.8	33	4 23 0	+	299	---	---	4 26 36	- 148	4 57 54
Capetown		M.	158.3	343	4 29 54	s	---	---	---	---	---	5 1 18
								---	---	---	---	4 39 54
								---	---	---	---	4 23 0
								---	---	---	---	5 1 48

NOTES.--a, MN 4h. 14m. 47s. and 4h. 17m. 46s. b, MN 4h. 20m. 4s.; ME 4h. 19m. 30s. c, PSN 4h. 18m. 18s.; PSE 4h. 18m. 20s.; SR₁ 4h. 21m. 38s.; SR₂ 4h. 23m. 23s. d, Mainka, P 4h. 11m. 53s., S 4h. 20m. 4s. e f g, SE 4h. 20m. 10s.; O-C +3s.; LE 4h. 31m. 9s.; ME 4h. 35m. 0s. h, 52°SN. 181°0E. i, iPR₁ 4h. 16m. 52s.; SR₁ 4h. 26m. 24s.; SR₂ 4h. 28m. 36s.; SR₃ 4h. 29m. 42s. j, e? 4h. 16m. 18s. k, MN 4h. 54m. 40s.; ME 4h. 56m. 35s. l, LN 4h. 42m. 0s.; LE 4h. 37m. 36s. m, iN₁ 4h. 24m. 36s.; iN₂ 4h. 25m. 30s.; iE 4h. 24m. 46s. n, M 4h. 26m. 12s., 4h. 40m. 6s., and 4h. 45m. 48s. o, i 4h. 15m. 38s. ?P. p, O-C +581s. q, PR₁ 4h. 33m. 12s. r, i 4h. 30m. 15s. s, O-C +593s.

1916. April 21d. 11h. 31m. 45s.

Epicentre 34°0N. 139°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Osaka	O.	3.4	278								
Mizusawa	N. O.	5.3	14	11 33 39	+ 32				11 34 26	a	b
	E. O.	5.3	14	11 33 40	+ 33				11 35 3		
Zi-ka-wei	W.	15.5	264	z 35 28	+ 3	z 36 30	e 38 34	+ 5			c
	W.	15.5	264	11 35 43	+ 31						
Manila	W.	25.6	225	e 36 57	- 32		11 41 32	- 27	11 46 7		d
Calcutta	N. O.E.	46.0	270	11 40 0	- 25		11 50 30	+ 197	11 57 42	11 58 54	
Batavia	W.	50.7	224	c 40 0	- 56					11 48 0	
Honolulu	M.	55.9	86	11 41 42	+ 12		11 49 48	+ 30	11 59 48	12 2 54	
Ekaterinburg	G.	56.2	320	i 41 33	+ 1		11 49 13	- 8			
Bombay	E. M.	60.6	274	11 41 e	- 19					12 14 42	
Kodaikanal	E. M.	61.2	263	11 41 48	- 17				11 46 30	11 47 30	
Colombo	M.	61.2	257	11 42 0	- 8					11 52 24	
Sydney	E. M.	68.7	167						11 51 0		f
Riverview	W.	68.7	170	e 42 18	- 36		i 50 58	- 57	e 59 12	E 1 14	
Victoria, B.C.	M.	69.5	45	11 43 1	+ 2				11 51 57	11 51 57	
Pulkovo	G.	69.8	330	i 43 4	+ 3	i 45 46	i 52 16	+ 7	12 4 0	z 8 0	g
Tiflis	G.	71.2	308	e 43 8	+ 1						
Melbourne	M.	72.0	175	i 51 18	h 0	11 53 18	11 56 30	+ 235	12 4 18	12 6 0	
Makeyevka	G.	72.2	316	i 43 16			11 52 38	+ 1	12 8 0	E 21 12	
Berkeley	N. E.	75.5	54	e 43 33	- 4		11 53 8	- 9			
	E.	75.5	54	e 43 31	- 6		11 53 9	- 8	e 6 25	12 9 51	
Lick	W.	76.4	54	e 43 44	+ 2		e 53 18	- 9			
Dyce, Aberdeen	Ma.	83.2	340	11 44 27	+ 5	? 47 57	11 47 57	?PR ₁	11 52 42		i
Edinburgh	M.	84.6	340	11 44 0	- 31					11 56 0	
Eskdalemuir	G.	85.1	340	i 44 38	+ 2	11 48 6	11 54 46	- 15	12 15 0		j
De Bilt		85.1	334	11 44 30	- 4	11 48 4	11 54 50	- 15	e 14 0		
Stonyhurst	M.	86.2	339						i 7 48	12 33 0	
Bidston	N. M.S.	86.7	339	11 43 36	- 66	11 48 12	11 56 6	+ 43		12 26 12	
Helwan	N. M.	86.8	304	11 43 54	- 49					11 59 12	
	E. M.	86.8	304	11 45 0	+ 17					11 57 54	
West Bromwich	N. M.	87.1	338	11 44 36	- 9	11 48 12	11 55 1	- 26			
	E. M.	87.1	338	11 44 43	- 2	11 48 12	11 55 4	- 23			
Kew	M.	87.5	336	11 47 30	+ 163					11 56 6	

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Padova	V.	87-5	326	11 44 37	- 10	—	11 54 58	- 34	12 7 30	12 29 43
Shide	M.S.	88-5	336	11 44 48	- 5	11 48 26	11 55 26	- 17	—	12 22 36
	M.B.	88-5	336	11 44 49	- 4	—	11 55 33	- 10	—	12 22 36
Pompei	N.	O.A.	89-7	322	11 48 35	+ 216	—	—	—	—
	E.	O.A.	89-7	322	11 45 0	+ 1	—	—	—	—
Moncalieri	S.	89-7	328	11 44 49	- 10	—	i 54 33	- 83	12 4 6	k
Rocca di Papa	Aga.	89-8	323	i 44 46	- 14	—	i 55 2	- 55	e 2 18	12 22 30
Malta	M.	93-2	318	11 54 0	l	—	—	—	—	12 3 0
Ottawa	B.	94-4	24	—	—	—	—	—	—	m
Mauritius	N.	M.	94-5	249	11 55 6	n	—	—	—	11 56 42
	E.	M.	94-5	249	11 53 48	o	—	—	—	11 58 0
Toronto	M.	94-6	27	11 49 48	+ 262	—	11 57 0	+ 13	12 14 12	12 20 36
Barcelona	Ma.	94-9	329	11 49 17	+ 229	—	? 55 33	- 77	12 6 30	12 26 40
Harvard Univ.	B.O.	98-6	22	e 46 10	+ 22	—	—	—	—	p
Washington	Ma.	99-5	28	—	—	—	11 55 56	-100	q	—
Coinbra	N.	W.	100-1	336	e 49 56	+ 240	—	—	12 21 24	12 29 36
	E.	W.	100-1	336	e 49 52	+ 236	—	—	12 24 30	12 28 54
San Fernando	N.	M.	102-5	332	11 50 0	+ 232	—	—	12 28 18	12 32 30
	E.	M.	102-5	332	—	—	—	—	—	12 33 0
Azores	M.	107-0	348	11 56 24	? S	—	? 56 24	-142	—	11 58 48
Cape Town	E.	M.	131-8	253	11 53 30	+ 310	—	—	—	11 54 30
St. Helena	M.	143-9	291	12 4 0	? S	—	—	—	—	12 28 0
La Paz	—	149-3	61	i 51 34	+ 121	11 56 45	12 4 0	+ 49	12 44 0	N 1 8

NOTES.—*a*, MN 11h. 35m. 0s.; ME 11h. 34m. 59s. *b*, PS 11h. 33m. 14s. *c*, MN 11h. 40m. 56s.; ME 11h. 41m. 44s.; MZ 11h. 40m. 32s. *d*, MN 11h. 47m. 5s.; ME 11h. 47m. 19s. *e*, 42s.? *f*, M 11h. 52m. 0s. and 12h. 1m. 18s. *g*, i PR₂ 11h. 47m. 28s.; i PS 11h. 52m. 59s.; SR₁ 11h. 56m. 54s.; SR₂ 12h. 0m. 3s.; 33°-ON. 139°-3E. *h*, O-C. +483s. *i*, M 11h. 54m. 42s. and 12h. 0m. 37s. *j*, PR₂ 11h. 51m. 32s.; SR₂ 12h. 9m. 0s. *k*, MN 12h. 26m. 42s.; ME 12h. 24m. 50s. *l*, O-C. +522s. ?S. *m*, e 11h. 49m. 12s.; i 11h. 55m. 31s. *n*, O-C. +590s. ?S. *o*, O-C. +502s. ?S. *p*, M 11h. 56m. 21s. ?S. and 12h. 4m. 52s. *q*, L 11h. 57m. 0s.; 12h. 2m. 36s., and 12h. 4m. 8s.

1916. April 21d. 13h. 56m. 6s. Epicentre 39°5N. 72°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PE ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Ekaterinburg	G.	18.9	340	i 0 54	+ 20	—	14 0 34	+ 28	—	—	
Tiflis	G.	20.7	285	e 0 49	— 6	—	i 4 28	— 16	—	—	
Calcutta	N. O.E.	21.9	136	14 1 0	— 10	—	14 4 30	— 39	—	—	
Makeyevka	G.	25.8	301	14 1 44	— 8	—	14 6 12	— 12	14 11 0	—	
Kodaikanal	E. M.	29.7	169	14 5 54	+ 203	—	—	—	14 11 0	14 12 18	
Pulkovo	G.	32.9	322	i 2 56	— 5	i 4 0	i 8 10	— 18	14 11 0	z 11 43	b
Colombo	M.	33.3	166	14 6 0	+ 175	—	—	—	—	—	
Padova	V.	43.7	298	14 4 16	— 14	—	—	—	—	—	
Rocca di Papa	Aga.	44.2	293	e 4 11	— 22	—	—	—	—	14 5 30	
De Bilt	—	46.5	309	14 4 43	— 6	—	i 11 23	— 17	e 15 0	—	
Moncalieri	S.	46.7	299	? 4 39	— 12	—	14 11 13	— 30	14 16 34	—	
Manila	W.	49.4	106	c 5 0	— 9	—	—	—	—	—	
Dyce, Aberdeen	Ma.	49.6	317	—	—	—	14 12 7	— 13	—	14 17 22	
Slide	M.S.	50.7	308	14 5 12	— 5	—	14 12 14	— 19	—	—	
	M.B.	50.7	308	14 5 17	— 0	—	—	—	—	—	
Barcelona	Ma.	51.7	296	—	—	—	14 12 23	— 23	—	—	

Notes.—a, S. 34m. given. b, SR, 14h. 0m. 48s.; 41°3N., 71°3E. c, Recorded as e.

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1916. April 24d. 4h. 26m. 28s.

Epicentre 18°5N. 68°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁	S.		O-C.	L.	M.	Notes Ref.
				H. M. s.	s.	H. M. s.	H. M. s.	s.	H. M. s.	H. M. s.			
Washington	W.	21-9	341	4 31 26	—	6	—	4 35 26	—	6	4 36 39	—	
	W.	21-9	341	4 31 25	—	7	—	4 35 28	—	3	4 37 0	—	
	W.	21-9	341	4 31 37	—	5	—	4 35 33	—	2	—	—	
Harvard Univ. N.	B.O.	24-0	354	4 31 49	—	7	—	4 36 6	—	6	c 39 41	—	
	B.O.	24-0	354	e 31 56	—	0	—	—	—	—	—	—	
Toronto	M.	26-9	342	4 32 18	—	7	—	4 36 54	—	13	4 38 24	4 38 24	
Ottawa	B.	27-7	348	4 32 22	—	11	—	4 37 0	—	22	—	—	
La Paz	—	35-0	180	i 33 25	—	16	4 35 0	4 38 54	—	29	4 46 10	N 51 15 b	
Azores	M.	41-5	54	4 37 0	—	145	—	—	—	—	—	—	
Lick	N. W.	50-2	303	e 35 27	—	9	—	i 42 37	—	12	e 48 32	4 55 20	
Berkeley	N.	50-8	304	4 35 33	—	7	—	i 42 40	—	17	—	—	
	E.	50-8	304	4 35 56	—	16	—	e 42 53	—	4	—	—	
Victoria, B.C.	M.	53-5	317	4 42 35	—	c	—	4 44 35	—	64	4 46 35	4 48 35	
Coimbra	N. W.	55-2	53	4 36 16	—	10	—	i 44 0	—	8	4 50 0	—	
	E. W.	55-2	53	4 36 16	—	10	—	i 43 56	—	4	4 52 40	4 55 0	
San Fernando	E. M.	56-7	58	4 35 30	—	48	—	—	—	—	4 44 0	5 1 0	
Bidston	N. M.S.	60-4	38	4 38 1	—	78	—	4 45 12	—	16	4 58 0	4 54 18	
Eskdalemuir	G.	60-6	36	4 37 0	—	16	—	4 45 18	—	19	—	E 59 0	
Edinburgh	M.	60-7	36	4 37 0	—	15	—	—	—	—	—	5 4 0	
West Bromwich	M.	60-9	40	—	—	—	—	4 45 2	—	1	—	—	
Shide	M.S.	61-1	42	4 37 20	—	32	—	4 45 10	—	5	—	4 59 17	
	M.B.	61-1	42	4 37 20	—	32	—	—	—	—	—	4 59 17	
Dyce, Aberdeen	Ma.	61-5	34	4 36 32	—	18	—	4 45 22	—	12	4 55 32	4 59 2	
Kew	M.	61-8	41	4 45 0	—	2	—	4 45 0	—	14	—	4 59 30	
De Bilt	E.	65-2	40	4 37 35	—	21	—	i 46 1	—	6	e 57 0	—	
Barcelona	Ma.	63-2	52	4 37 30	—	29	—	4 45 35	—	4	e 56 0	5 8 27	
Moncalieri	S.	67-0	48	i 37 54	—	28	—	i 46 23	—	5	4 53 55	—	
Padova	W.	69-9	47	4 36 30	—	74	—	4 46 48	—	5	—	—	
Rocca di Papa	Aga.	71-0	51	e 37 55	—	4	—	—	—	—	—	4 38 42	
Pulkovo	G.	78-1	31	i 38 34	—	2	i 41 26	i 48 26	—	3	5 0 0	E 9 34 d	
Honolulu	M.	83-4	290	4 39 30	—	24	—	4 49 24	—	5	—	5 16 24	
Makeyevka	G.	86-5	40	4 39 20	—	4	—	i 49 34	—	30	5 6 0	E 16 1	
Helwan	N. M.	88-6	59	4 50 6	—	25	—	4 50 6	—	57	—	—	
	E. M.	88-6	59	4 49 30	—	25	—	4 49 30	—	21	—	—	

Tiflis	G.	93.6	44	e 39 59	- 5	---	4 50 13	- 47	5 4 0	N 19 18
Tashkent	G.	108.3	32	e 41 e	+ 3	---	i 51 30	-131	5 11 0	N 20 7 f
Osaka	O.	122.4	337	---	---	---	---	---	---	---
Zi-ka-wei	W.	129.5	350	z 45 44	+ 170	---	---	---	---	g h
	W.	129.5	350	e 48 58	+ 364	---	---	---	---	---
Calcutta	O.E.	132.9	31	d 49 24	+ 375	---	---	---	---	---
Riverview	W.	141.9	238	? 39 30	- 257	---	---	---	---	F 8 47
Manila	W.	145.8	344	---	---	---	---	---	4 49 3	---
Batavia	W.	166.7	23	---	---	---	---	---	---	4 58 0 j

NOTES.—a, LN 4h. 40m. 36s.; LE 4h. 40m. 48s. b, SR 4h. 41m. 18s.; f 4h. 39m. 25s.; 4h. 41m. 37s., and 4h. 43m. 15s.
c, O-C. +397s. d, SR₁ 4h. 54m. 0s.; SR₂ 4h. 56m. 42s.; 10° 0' N. 68° 0' W. e, circa 21s. f, e, 74h. 45m. 0s.
e₁ 4h. 46m. 0s.; i, 4h. 46m. 8s.; i₂ 4h. 46m. 16s.; e₂ 5h. 5m. 0s. g, PS 4h. 49m. 47s. h, LZ 4h. 49m. 2s.
i, e 4h. 46m. 14s. j, e 4h. 47m. 0s.

1916. April 24d. 8h. 2m. 8s.

Epicentre 10° 0N. 82° 0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes, Ref.
Washington	W.	29-2	8	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
	W.	29-2	8	8 8 11	- 17	---	8 13 30	+ 2	8 16 3	8 20 49	
La Paz	---	29-6	152	8 8 17	- 11	---	8 13 33	+ 5	8 16 36	8 20 21	
Harvard Uni.	N. B.O.	33-7	15	i 8 37	+ 5	8 9 29	i 13 29	- 6	8 18 0	8 18 45	a
	B.O.	33-7	15	e 9 6	- 4	---	8 14 3	- 40	e 20 8	8 25 52	
Toronto	E. M.	33-7	3	? 9 54	+ 44	---	8 14 38	- 5	e 19 30	---	
Ottawa	B.	35-8	8	8 9 14	- 14	---	8 15 24	+ 41	b	8 23 0	
Lick	W.	44-8	314	e 10 16	- 24	---	8 14 52	- 23	c	---	
Berkeley	N. ---	45-6	314	e 10 23	- 22	---	e 16 58	- 22	---	8 30 28	e
	E. ---	45-6	314	i 10 19	- 26	---	8 17 3	- 28	---	8 30 36	d
Victoria, B.C.	M.	51-7	326	8 10 54	+ 32	---	8 17 8	- 28	e 23 8	8 30 53	
Azores	M.	57-3	52	7 59 0	f	---	---	---	e 31 35	8 40 53	
Paris	---	63-4	44	8 14 31	+ 108	---	---	---	---	8 41 0	
Ascension	M.	69-5	102	8 14 0	+ 38	---	---	---	---	8 26 0	
Coimbra	N. W.	71-1	51	e 13 48	+ 17	---	i 23 16	+ 30	8 36 8	8 38 8	g
	E. W.	71-1	51	i 13 40	+ 9	---	8 23 8	+ 22	8 36 12	8 38 8	
	M.	71-1	51	i 14 7	+ 36	---	i 23 28	+ 42	8 36 26	8 39 27	
San Fernando	N. M.	72-6	55	8 14 0	+ 18	---	8 23 0	- 5	8 37 0	8 44 0	
	E. M.	72-6	55	8 14 0	+ 18	---	8 24 0	+ 55	8 37 30	8 42 0	
Honolulu	M.	73-4	289	8 14 0	+ 12	---	8 23 6	- 11	8 36 54	8 39 42	
Eskdalemuir	G.	75-3	35	8 14 12	+ 13	---	8 23 40	+ 3	8 35 0	---	
Bidston	N. M.S.	75-4	37	8 14 6	+ 7	---	8 24 48	+ 71	---	8 43 18	h
Edinburgh	M.	75-5	35	8 14 0	+ 1	---	---	---	---	8 52 0	
West Bromwich	M.	75-9	38	8 13 7	- 7	---	8 23 55	+ 11	8 38 20	---	
Dyce Aberdeen	Ma.	76-0	33	8 14 17	+ 14	---	? 20 17	- 208	8 27 17	8 42 17	
Shide	M.S.	76-3	40	8 14 9	+ 4	---	8 23 57	+ 8	---	---	
	M.B.	76-3	40	8 14 9	+ 4	---	8 24 0	+ 11	---	8 40 17	i
Kew	M.	77-0	39	8 14 0	- 9	---	---	---	---	8 48 48	
Barcelona	Ma.	78-9	50	8 14 19	- 1	---	8 24 43	+ 24	8 40 38	8 45 15	
St. Helena	M.	79-9	108	8 43 0	k	---	---	---	---	9 27 0	
De Bilt	E. ---	79-9	38	8 14 27	- 1	---	8 24 39	+ 5	8 40 0	---	
Malta	M.	80-2	54	8 18 0	+ 212	---	---	---	---	---	
Moncalieri	S.	82-7	46	i 14 35	- 7	---	8 25 6	+ 4	8 32 36	---	l
Padova	V.	85-5	45	8 14 57	- 2	---	8 25 53	+ 20	---	---	

Rocca di Papa	Aga.	86-8	48	c 14 48	- 16			?	25 20	- 27									
Pulkovo	G.	92-2	28	i 15 21	- 13		i 19 3	8	26 20	- 24		m	8 41 0						
Makeyevka	G.	101-5	36	e 16 5	- 21								8 46 0						
Cape Town	N.	104-2	123	8 19 42	+ 132				8 57 24		p	9 1 42							
Helwan	E.	104-4	55	8 17 42	+ 63														
		104-4	55	8 16 0	- 39														
Ekaterinburg	G.	106-4	20	i 16 24	- 25														
Tiflis	G.	108-9	39	r 16 43	- 18														
Tashkent	G.	122-2	25										8 30 0						
Osaka	O.	123-0	323	8 22 44	+ 399				8 38 37	+ 437			8 56 7						
Riverview	W.	126-0	235	? 15 18	- 180				? 29 54	- 107			e 54 30						
Zi-ka-wei	W.	133-1	332	z 21 22	+ 153				e 35 41	+ 194			e 0 22						
	W.	133-1	332	e 21 25	+ 156				z 37 7	+ 277									
Adelaide	M.	135-5	230	8 24 36	+ 336														
Melbourne	M.	137-3	238	e 24 36	+ 328		S 30 0		8 40 12	+ 435			9 8 30						
Bombay	E.	141-8	41	8 24 0	+ 307														
Mauritius	E.	142-6	97	8 22 36	+ 187								9 19 36						
Calcutta	N.	146-1	16	8 21 18	+ 125								i 23 24						
Manila	W.	146-5	317	c 21 43	+ 118				? 35 16	+ 88			? 52 24						
Kodaikanal	E.	151-3	46	8 25 24	+ 319								8 47 0						
Batavia	W.	170-6	291	e 22 0	+ 49								c 28 0						

NOTES.—*a*, SR 8h. 15m. 44s.; ME 8h. 21m. 30s. *b*, L Sh. 17m. 24s. and 8h. 21m. 0s. *c*, Sh. 18m. 30s., Sh. 18m. 42s., and 8h. 20m. 0s. *d*, MN Sh. 26m. 18s.; ME 8h. 22m. 30s. *e*, M 8h. 31m. 27s. and Sh. 36m. 7s. *f*, O-C. -782s. *g*, i E 8h. 23m. 52s. *h*, MN Sh. 37m. 0s.; ME 8h. 40m. 0s. *i*, 55s. ? *j*, M 8h. 40m. 17s., 8h. 42m. 17s., and 8h. 46m. 17s. *k*, O-C. +1715s. *l*, MN 8h. 51m. 45s.; ME 8h. 51m. 49s. *m*, e L Sh. 31m. 42s., 8h. 48m. 0s., and 8h. 52m. 45s. *n*, i PR₂ Sh. 21m. 47s., and i 8h. 25m. 54s.; PS 8h. 27m. 48s.; SR₂ 8h. 36m. 30s., 13° 3' N. 84° 1' W. *o*, e₂ 8h. 20m. 20s. and e₃ 8h. 26m. 4s. *p*, O-C. +1722s. *q*, M 9h. 4m. 18s. and 9h. 11m. 30s. *r*, S recorded as e, e₂ 8h. 19m. 31s., e₃ 8h. 20m. 57s. *s*, Other records doubtful. *t*, MN 9h. 25m. 5s.; ME 9h. 24m. 15s. *u*, MN 9h. 26m. 2s.; ME 9h. 21m. 55s. *v*, PR₂ 8h. 34m. 24s.; SR₁ 8h. 49m. 30s.; SR₂ 8h. 56m. 12s. *w*, 33s. ?

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1916. April 26d. 2h. 21m. 14s.

Epicentre 9°5N. 84°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	s.	H. M. S.	H. M. S.	s.	H. M. S.	H. M. S.	
Port-au-Prince	O.B.	14-5	50	—	—	—	2 26 21	- 73	2 27 36	2 25 0	
	O.B.	14-5	50	i 24 55	+ 8	—	2 26 38	- 56	2 28 16	2 25 33	
Washington	W.	30-0	11	2 27 34	- 8	—	2 32 34	- 14	2 34 48	2 40 18	
	W.	30-0	11	2 27 28	- 14	—	2 32 37	- 11	2 34 51	2 39 5	
	Ma.	30-0	11	2 27 27	- 15	—	2 32 40	- 8	—	—	
La Paz	—	30-4	149	i 27 32	- 14	2 28 40	1 32 32	- 23	2 36 15	N 37 24 a	
Toronto	M.	34-4	6	—	—	—	2 33 12	- 48	2 35 36	2 41 12	
Harvard Univ. N.	B.O.	34-8	17	2 28 17	- 8	—	2 33 48	- 18	e 37 40	b	
	B.O.	34-8	17	2 28 22	- 3	—	2 33 56	- 10	—	—	
Ottawa	B.	36-6	10	2 29 18	+ 37	—	N 34 30	- 2	—	—	
Lick	B.O.	43-7	315	e 29 39	+ 1	—	e 36 13	+ 4	e 41 44	2 47 26 c	
Berkeley	W.	44-5	316	2 29 23	- 20	—	N 36 24	+ 1	e 42 4	d	
Azores	M.	59-3	52	2 26 48	- 273	—	—	—	—	2 58 36	
Honolulu	M.	71-8	289	2 33 6	+ 23	—	2 42 36	+ 34	2 55 12	2 59 36	
Coimbra	W.	72-9	50	e 33 6	+ 17	—	2 42 26	+ 11	2 55 34	—	
	E.	72-9	50	e 32 58	+ 9	—	—	—	—	—	
San Fernando	M.	72-9	50	—	—	—	2 42 30	+ 15	2 55 35	2 58 8 e	
	M.	74-5	55	—	—	—	2 43 0	+ 26	2 55 30	3 3 30	
	M.	74-5	55	—	—	—	2 43 0	+ 26	2 56 0	3 12 0	
Bidston	M.S.	77-0	37	2 43 12	+ S	—	2 43 12	+ 9	—	3 2 30 f	
Eskdalomuir	G.	77-0	35	2 33 38	+ 23	—	2 43 18	+ 15	2 58 0	—	
Edinburgh	M.	77-1	35	2 33 0	- 16	—	—	—	—	—	
Stonyhurst	M.	77-4	37	2 37 i	+ S	—	—	—	—	—	
Dyce, Aberdeen	Ma.	77-6	33	2 43 19	+ S	—	2 44 0	+ 53	—	3 4 48	
West Bronwich	M.	77-7	38	2 33 16	- 3	—	2 43 19	+ 9	2 53 44	3 3 4	
Shide	M.S.	78-1	40	2 33 30	+ 11	—	2 43 7	- 4	2 48 19	—	
	M.B.	78-1	40	? 33 13	- 9	—	2 43 10	- 5	—	3 6 18	
Kew	M.	78-7	39	2 42 36	? S	—	2 43 10	- 5	—	3 6 18	
Paris	—	80-6	42	2 33 40	+ 3	—	2 42 36	- 46	—	3 9 30	
Barcelona	Ma.	80-9	49	2 33 32	+ 6	—	2 43 5	- 39	—	3 1 0	
De Bilt	—	82-0	38	2 33 48	+ 4	—	2 43 45	- 3	2 51 30	—	
Moncalieri	S.	84-6	45	e 33 54	- 6	—	i 43 58	- 2	e 0 0	—	
Rocca di Papa	Aga.	88-6	48	e 34 5	- 17	—	i 44 12	- 17	2 53 11	k	
Monte Cassino N.	V.	89-5	48	2 34 27	0	—	? 44 55	- 18	e 7 54	—	

Pulkovo	G.	93-5	27	i 34 42	- 7	i 38 31	2 45 48	- 17	2 58 0	z 11 31 l
Makeyevka	G.	103-1	36	c 35 30	- 10	---	---	---	2 59 0	3 14 57 m
Helwan	N.	106-5	55	2 45 6	+ 550	---	---	---	---	3 31 18
	E.	106-5	55	2 40 18	+ 262	---	---	---	---	3 33 42
Kkaterinburg	G.	107-7	19	2 35 45	- 16	---	---	---	2 56 0	3 19 34 n
Osaka	O.	122-2	322	---	---	---	---	---	---	o
Riverview	W.	124-0	235	f 39 18	+ 123	---	? 52 30	+ 117	e 20 48	3 31 29 p
Melbourne	M.	127-8	229	i 53 0	? S	---	? 53 0	+ 120	---	2 54 42
Zi-ka-wei	W.	132-6	330	2 44 14	+ 381	---	e 55 28	+ 236	---	q
Mauritius	E.	141-8	110	2 54 6	? S	---	? 54 6	+ 98	3 36 42	3 40 18
Manila	M.	145-3	314	---	---	---	---	---	---	r
Batavia	W.	168-8	286	---	---	---	---	---	c 44 0	4 8 0 s

NOTES.—*a*, i 2h. 33m. 10s. *b*, MN 2h. 36m. 52s. and ME 2h. 40m. 53s. *c*, i 2h. 29m. 18s. (P); 2h. 30m. 18s. and iN 2h. 34m. 30s. (S); iE 2h. 33m. 0s. *d*, M 2h. 48m. 26s. and 2h. 52m. 30s. *e*, i 2h. 44m. 5s. *f*, FR, 2h. 48m. 24s.; S 2h. 52m. 12s. *g*, MN 3h. 4m. 0s.; ME 3h. 3m. 0s. *h*, MN 3h. 5m. 0s., and 3h. 18m. 0s. *i*, 6e. *j*, MN 3h. 4m. 43s.; ME 3h. 11m. 41s. *k*, MN 3h. 5m. 13s.; ME 3h. 4m. 48s. *l*, e 2h. 37m. 40s.; i 2h. 45m. 12s.; PS 2h. 47m. 5s.; SR, 2h. 52m. 0s.; SR, 2h. 54m. 42s.; 15° 0N., 90° 0W. *m*, i 2h. 46m. 4s. *n*, i 2h. 40m. 13s. *o*, MN 3h. 38m. 20s.; ME 3h. 35m. 33s. *p*, e (PS) 2h. 47m. 42s. *q*, MN 3h. 34m. 48s.; ME 3h. 34m. 38s.; MZ 3h. 43m. 58s. *r*, e 2h. 41m. 13s. *s*, e 2h. 42m. 0s.

1916. May 9d. 14h. 33m. 27s.

Epicentre 0°5N. 88°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁			S.			O-C.	L.			M.	Notes Ref.	
				H.	M.	S.	S.	H.	M.	S.	H.	M.	S.	S.	H.	M.	S.			H.
Colombo	M.	11.3	310																	
Kodaikanal	M.	14.6	312																	
Batavia	W.	19.4	110	14	38	7	+ 6				14	41	43	+ 6						
Calcutta	N. O.E.	22.0	1	14	38	36	+ 4				14	42	42	+ 10						
	E. C.E.	22.0	1	14	38	24	- 8				14	42	24	- 8	14	49	24	14	51	36
Bombay	M.	24.0	321	14	39	42	+ 47													14 47 15
Manila	W.	35.0	64	e	40	42	+ 2				14	46	40	+ 18	14	53	54			a
Mauritius	N. M.	36.4	234	14	50	0	b													
Zi-ka-wei	W.	43.7	42	z	41	46	- 5				c	48	16	- 9	e	52	58			c
	W.	43.7	42	e	41	56	+ 5													
Osaka	O.	55.5	47	e	43	35	+ 25													d
Ekaterinburg	G.	60.6	343	i	43	51	+ 8	14	46	5	i	52	8	+ 10	15	5	0	15	9	57 e
Helwan	N. M.	61.6	304	14	52	24	?				14	52	24	+ 14						15 12 12
	E. M.	61.6	304	14	52	12	?				14	52	12	+ 2						15 12 6
Melbourne	M.	64.4	133	15	4	12	f				15	6	36	g	15	10	0	15	14	48
Sydney	E. M.	67.8	127	14	54	18	? S				14	54	18	+ 51	15	11	0	15	14	30 h
Riverview	W.	67.9	127	e	44	6	- 24				e	63	36	+ 8	e	3	36	15	6	0
Cape Town	E. M.	73.8	234	15	16	48	i													15 28 30
Pulkovo	G.	74.1	334	i	45	0	- 10				i	54	35	- 7	15	11	0	z	20	7 j
Rocca di Papa	Aga.	79.1	313	14	45	46	+ 5				? 55	36	- 4							
Moncalieri	S.	83.1	315	14	56	24	? S				14	56	24	- 1	15	14	14			k
De Bilt	E. -	85.5	322								14	56	45	- 8	e	15	0			
Paris	-	86.9	319								14	57	10	+ 3	15	27	0			
Kew	M.	88.8	321																	
Slide	M.S.	89.4	321								14	56	56	- 38						15 32 0
	M.B.	89.4	321								14	56	39	- 35	15	20	0			
Bidston	N. M.S.	90.5	323	14	57	30	? S				14	57	30	- 16						15 31 12
Edinburgh	M.	90.5	326	14	57	0	? S				14	57	0	- 46						15 36 0
Rio Tinto	M.	93.7	308	14	57	0	? S				? 57	0	- 80							15 32 0
Honolulu	M.	111.6	67												15	34	42			15 40 6
Ottawa	B.	132.0	345												7					

Toronto	M.	134.6	348	—	—	—	—	—	15 53 24	—
La Paz	—	152.0	234	14 53 41	+ 135	—	—	—	15 50 0	N 1 0

NOTES.—*a*, MN 14h. 58m. 14s.; ME 14h. 58m. 11s. *b*, O—C +548s. *c*, MN 14h. 59m. 28s.; ME 14h. 59m. 59s.;
 MZ 15h. 2m. 52s. *d*, MN 15h. 4m. 57s.; ME 15h. 5m. 27s. *e*, PR₂ 14h. 47m. 46s.; *e* 14h. 51m. 58s.
f, O—C +1204s. *g*, O—C +831s. *h*, SR₁ 15h. 6m. 0s. *i*, O—C +1900s.
j, iPS 14h. 55m. 8s.; iPR₂ 14h. 49m. 39s.; iPR₂ 14h. 50m. 41s.; SR₁ 14h. 59m. 18s.; SR₂ 15h. 2m. 19s.; SR₂ 15h. 4m. 6s.;
 4°-0N. 96°-0E. *k*, MN 15h. 25m. 16s.; ME 15h. 30m. 26s. *l*, L 15h. 53m. 0s. to 15h. 56m. 0s., and 16h. 38m. 0s.

1916. June 9d. 21h. 23m. 59s.

Epicentre 5°0N. 128°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.			PR ₁			S.			O-C.			L.			M.			Notes Ref.
				H.	M.	S.	s.	H.	M.	S.	H.	M.	S.	s.	H.	M.	S.	s.	H.	M.	S.	s.	H.	M.	
Manila	W.	11.8	325																						
Batavia	W.	23.9	243	c	26	58																			
Zi-ka-wei	W.	26.9	317	c	29	48																			
	Z.	26.9	347																						
Osaka	W.	30.5	192																						
Mizusawa	O.	36.1	17		21	31	21																		
	N.	36.1	17		21	31	21																		
	E.	36.1	17		21	31	21																		
Sydney	M.	44.6	152		21	36	30																		
Riverview	W.	44.6	152		21	36	30																		
Honolulu	M.	73.4	69																						
	e	73.4	69																						
Ekaterinburg	G.	73.5	328																						
Tiflis	G.	81.6	311	e	36	30																			
Makeyevka	G.	86.3	318		21	37	3																		
Pulkovo	G.	89.6	330	i	37	6																			
Holwan E and N.	M.	93.2	300		21	49	0																		
De Bilt	E.	105.2	328																						
Dyce, Aberdeen	Ma.	106.0	331																						
Moncalleri	S.	107.1	320		21	42	55																		
Edinburgh	M.	107.2	334		21	49	0																		
Eskdalemuir	G.	107.5	333	e	43	1																			
Paris		108.0	326		21	39	0																		
Stonyhurst	M.	108.1	332		21	47	30																		
Kew	M.	108.4	329		22	21	0																		
Bidston	N.	M.S.	108.7	332		21	47	30																	
Shide	M.S.	109.4	329																						
	M.B.	109.4	329																						
Coimbra	E.	119.6	323																						
Rio Tinto	M.	119.9	319		22	26	0																		
San Fernando	N.	M.	120.5	318		22	55	0																	
Ottawa	B.	125.4	20																						
La Paz		160.5	127		21	44	31																		

NOTES.—*a.* MN 21h. 32m. 9s.; ME 21s. 32m. 35s. *b.* MN 21h. 40m. 23s.; ME 21h. 39m. 42s. *c.* PS 21h. 30m. 30s.
d. 8°0N. 126°5E. *e.* iPR, 21h. 40m. 33s.; i 21h. 47m. 30s.; SR, 21h. 53m. 42s.; SR, 21h. 57m. 0s.; SR, 22h. 1m. 48s.;
6°0N. 125°0E. *f.* MN 22h. 28m. 0s.; ME 22h. 28m. 25s. *g.* MN 22h. 31m. 0s.; ME 22h. 29m. 47s.
h. c 21h. 49m. 33s., and 21h. 50m. 53s. (=S); MN 22h. 23m. 0s.; ME 22h. 29m. 0s. *i.* O-C. +519s.
j. eL 22h. 29m. 30s., and L 22h. 35m. 0s. *k.* S given as i (S).

09

1916. June 21d. 19h. 56m. 9s.

Epicentre 34°5N. 77°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁			S.	O-C.	L.	M.	Notes Ref.		
				H.	M.	S.	s.	H.	M.	S.	H.	M.	S.	H.		M.	S.
Calcutta	N.	O.E.	15.5	137	20	3	0	—	—	—	20	3	0	—	—		
	E.	O.E.	15.5	137	20	3	6	?	5	—	20	3	6	—	—		
Bombay	M.	—	16.0	195	—	—	—	—	—	—	—	—	—	—	—		
Kodaikanal	M.	—	24.3	180	20	9	36	?	L	—	—	—	20	9	36	20 5 21	
Ekaaterinburg	G.	—	24.9	338	i	1	38	—	—	—	20	5	59	—	12	20 8 30	20 10 36
Tiflis	G.	—	26.2	296	e	2	0	+	1	—	e	6	34	—	1	20 12 0	20 10 42
Colombo	M.	—	27.7	174	20	10	0	—	—	—	—	—	—	—	—	—	—
Makeyevka	G.	—	31.9	307	?	2	50	—	—	—	20	8	7	—	8	20 16 0	—
Zi-ka-wei	W.	—	37.1	83	—	—	—	—	—	—	—	—	—	—	—	—	z 10 0
Helwan	N.	M.	38.6	276	20	19	0	—	—	—	—	—	—	—	—	—	—
Pulkovo	G.	—	39.3	325	20	3	54	—	—	—	20	9	48	—	18	20 16 0	20 9 e
Moncalieri	S.	—	52.6	304	—	—	—	—	—	—	?	17	32	—	+270	20 24 44	—
De Bilt	—	—	52.8	312	—	—	—	—	—	—	20	17	10	—	+247	20 26 0	20 26 49
Paris	—	—	55.2	309	—	—	—	—	—	—	—	—	—	—	—	20 26 0	—
Shide	M.S.	—	57.0	312	—	—	—	—	—	—	—	—	—	—	—	—	20 23 30
Edinburgh	M.B.	—	57.0	312	—	—	—	—	—	—	—	—	—	—	—	—	20 23 30
	M.	—	56.8	319	20	27	0	?	L	—	—	—	—	—	—	—	20 32 0

NOTES.—a, i PS 20h. 6m. 6s.; 39°5N. 74°2E. b, O-C. +466s. c, e 20h. 13m. 20s. d, O-C. +908s.
e, SR, 20h. 12m. 42s

E2

E1

1916. June 21d. 21h. 32m. 33s.

Epicentre 17°0S. 57°0W

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
La Paz N.	---	10.7	273	i 35 26	+ 13	---	i 37 28	+ 8	---	---	
Port-au-Prince	O.B.	38.6	336	c 39 18	- 59	---	---	---	21 45 22	21 45 31	
Washington	W.	59.0	342	21 42 39	+ 1	---	21 50 48	+ 4	a	---	
Azores	M.	62.1	28	21 43 42	+ 43	---	---	---	---	21 56 30	
Toronto	M.	64.0	342	---	---	---	---	---	21 51 54	21 52 30	
Ottawa	B.	64.7	346	---	---	---	---	---	---	---	
Cape Town E.	M.	68.8	120	i 43 15	- 1	---	21 51 58	+ 4	b	---	c
San Fernando E.	M.	71.7	41	21 44 0	- 1	---	21 52 12	- 33	21 55 12	21 56 24	
	M.	71.7	41	21 44 0	- 1	---	---	---	21 54 30	22 10 0	
Rio Tinto	M.	72.3	40	21 45 0	+ 55	---	---	---	21 57 0	22 14 30	
Coimbra N.	W.	72.8	36	---	---	---	i 53 50	+ 17	22 3 18	---	d
	W.	72.8	36	21 44 16	+ 8	---	i 53 16	+ 13	---	22 3 50	
Barcelona	Ma.	79.9	41	21 44 47	- 4	---	---	---	---	---	c
Shide	M.S.	83.4	33	21 45 f	- 11	---	21 55 g	+ 9	---	---	
	M.B.	83.4	33	21 45 f	- 11	---	21 55 g	+ 9	---	---	
Bidston N.	M.S.	84.2	29	21 45 18	+ 2	---	21 49 36	h	---	22 12 42	
Kew	M.	84.3	32	21 48 0	- 11	---	---	---	---	21 59 36	
Paris	---	84.3	35	21 45 0	- 11	21 51 59	---	---	---	---	
Stonyhurst	M.	84.7	29	21 45 j	+ 30	---	21 54 49	- 55	22 12 0	---	
Moncalieri	S.	85.2	40	21 45 16	- 6	---	21 52 10	- 224	21 57 27	---	
Eskdalemuir	G.	85.3	28	21 45 11	- 12	21 48 24	21 54 45	- 70	---	22 1 0	m
Edinburgh	M.	85.7	27	21 45 0	- 25	---	---	---	---	---	
Rocca di Papa	Aga.	87.0	45	21 44 55	- 37	---	? 58 23	+ 129	22 10 12	---	
De Bilt	---	87.4	33	21 45 21	- 13	---	---	---	---	---	
Monte Cassino E.	V.	87.5	45	21 45 27	- 8	---	---	---	---	21 51 35	
Helwan N.	M.	96.9	61	21 50 0	+ 213	---	---	---	---	22 16 54	
Pulkovo	G.	103.3	31	o 46 32	- 28	---	---	---	---	---	
Makeyevka	G.	105.9	44	i 46 52	- 20	---	---	---	---	---	
Honolulu	M.	106.0	288	21 51 18	+ 246	---	22 7 30	p	22 20 16	22 24 36	o
Tifis	G.	109.9	51	---	---	---	---	---	22 26 0	---	q
Ekaterinburg	G.	119.1	34	e 47 41	- 30	---	---	---	---	---	r
Riverview	W.	122.6	208	? 55 48	u	---	? 59 30	- 132	c 9 21	E 10 39	t
Bombay	M.	132.3	79	---	---	---	---	---	---	22 49 47	
Kodaikanal	M.	135.3	90	21 53 36	+ 252	---	---	---	22 3 48	22 10 0	

32

Cofombo	M.	136-6	98	21 54 0	+	271	---	---	---	---	---	
Mizusawa	N.	O.	152-9	328	21 53 55	+	199	---	---	---	---	
	E.	O.	152-9	328	21 51 29	+	53	---	---	---	---	
Batavia	W.		153-4	138	1 21 20	+	43	---	---	---	21 58 0	
Osaka	O.		159-1	330	21 52 22	+	84	---	22 4 46	- 19	22 14 51	22 19 31
Zi-ka-wci	W.		165-7	6	z 51 45	+	25	---	---	---	---	---
	W.		165-7	6	c 51 50	+	30	---	e 3 2	-146	---	---
Manila	W.		176-9	140	c 51 53	-	2	---	22 3 3	-173	22 16 23	E 19 7

NOTES.—*a*, L 21h. 58m. 54s. and 21h. 59m. 12s. *b*, c LN 22h. 0m. 42s.; LE 22h. 6m. 0s. and 22h. 26m. 0s.; LN 22h. 8m. 0s.
c, i 21h. 45m. 17s. *d*, iN 21h. 57m. 40s.; iE 21h. 57m. 50s. *e*, i 21h. 59m. 51s. *f*, *circa* 0s.
g, *circa* 13s. *h*, O-C. -366s. *i*, MN 22h. 16m. -17m.; ME 22h. 20m. -21m. *j*, 48s.1. *k*, M 22h. 2m. 36s.,
and 22h. 26m. 0s. *l*, MN 21h. 59m. 53s.; ME 22h. 1m. 13s. *m*, SR 21h. 58m. 55s. *n*, M 21h. 59m. 0s.,
and 22h. 11m. 0s. *o*, i, 21h. 46m. 32s. (P?); i₂ 21h. 49m. 38s.; i₃ 21h. 51m. 19s.; i₄ 21h. 56m. 12s.; e₁ 22h. 2m. 11s.;
e₂ 22h. 4m. 8s.; e₃ 22h. 6m. 43s. *p*, O-C +485s. *q*, i₂ 21h. 51m. 51s. *r*, e 21h. 50m. 30s.
s, ME 22h. 7m. 54s. and 22h. 10m. 36s. *t*, e₂ 21h. 50m. 28s.; i₁ 21h. 50m. 44s.; i₂ 21h. 50m. 48s.; i₃ 21h. 52m. 58s.;
i₄ 21h. 53m. 7s.; i₅ 21h. 54m. 2s.; i₆ 21h. 54m. 58s.; i₇ 21h. 56m. 2s.; i₈ 21h. 57m. 6s.; i₉ 22h. 7m. 41s.
u, O-C. +440s.

1916. June 30d. 3h. 0m. 6s.

Epicentre 0°5N. 82°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O.-C.	PR ₁	S.	O.-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Port-au-Prince	O.B.	20.4	28	e 4 30	—	—	—	—	—	—	
	O.B.	20.4	28	? 4 55	+	—	—	—	—	—	
La Paz	—	21.8	142	i 5 9	—	—	—	—	—	N 14 40	a
Washington	N. W.	38.6	6	3 7 19	—	—	—	—	—	—	
	E. W.	38.6	6	—	—	—	—	—	—	—	
	Ma.	38.6	6	—	—	—	—	—	—	—	
Toronto	M.	43.2	3	3 7 12	—	—	—	—	—	—	
Ottawa	B.	45.2	6	N 8 42	+	—	—	—	—	—	
Lfak	N. W.	51.7	320	e 9 43	—	—	—	—	—	—	
Berkeley	N. —	52.5	320	—	—	—	—	—	—	—	
	V. —	52.5	320	e 9 54	+	—	—	—	—	—	
Victoria, B.C.	M.	59.7	329	3 10 36	+	—	—	—	—	—	
	V. M.	59.7	329	3 10 36	+	—	—	—	—	—	
Azores	M.	63.6	47	3 10 24	—	—	—	—	—	—	
Honolulu	M.	76.8	292	3 22 48	—	—	—	—	—	—	
Coimbra	M.	77.2	48	3 12 8	—	—	—	—	—	—	
	N. W.	77.2	48	—	—	—	—	—	—	—	
	E. W.	77.2	48	3 12 19	+	—	—	—	—	—	
Rio Tinto	M.	78.1	51	3 14 0	+	—	—	—	—	—	
San Fernando	N. M.	78.3	53	3 12 30	+	—	—	—	—	—	
	E. M.	78.3	53	3 12 30	+	—	—	—	—	—	
Bidston	N. M.S.	83.0	36	3 13 0	+	—	—	—	—	—	
Eskdalemuir	G.	83.2	34	3 12 45	+	—	—	—	—	—	
Edinburgh	M.	83.3	34	3 13 0	+	—	—	—	—	—	
West Bromwich	M.	83.5	37	3 12 53	+	—	—	—	—	—	
Shide	M.S.	83.7	39	3 12 53	+	—	—	—	—	—	
	M.B.	83.7	39	3 12 53	+	—	—	—	—	—	
Kew	M.	84.4	38	3 12 36	—	—	—	—	—	—	
Barcelona	Ma.	85.3	49	i 12 56	—	—	—	—	—	—	
Paris	—	86.0	41	3 13 0	+	—	—	—	—	—	
De Bilt	E. —	87.8	38	3 13 13	+	—	—	—	—	—	
Moncalieri	S.	89.4	45	3 13 16	—	—	—	—	—	—	
Rocca di Papa	Agg.	93.2	48	e 13 33	—	—	—	—	—	—	
Cape Town	E. M.	99.0	124	3 24 30	?	—	—	—	—	—	

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Pulkovo		G.	100-6	28	e 14	8	- 11											
Helwan	N.	M.	109-8	58	3 28	0	+ 238			3 28	0	+ 28						4 15 36
	E.	M.	109-8	58	3 19	0	- 20											4 12 36
Tiflis		G.	116-2	42	m 15	12	- 20											4 11 21
Riverview		W.	120-2	230	? 16	24	+ 35			e 29	6	+ 9		3 56	0			N 0 56
Sydney	E.	M.	120-2	230	3 26	a	o			3 37	p	q		3 57	30			4 2 30
Adelaide		M.	128-9	223	3 22	48	+ 379											4 13 12
Osaka		O.	130-4	319	3 22	38	+ 362											
Zi-ka-wei		W.	141-3	327						e 39	46	s		e 2	34			r
Bombay	E.	M.	148-5	50														4 31 26
Manila		W.	152-7	303										3 58	42			
Kodalkanai		M.	157-0	62	? 20	12	r							4 32	48			4 33 48
Colombo		M.	169-4	68	3 38	0	w											
Batavia		W.	169-5	237	? 21	0	- 114			? 32	0	- 72		? 24	0			? 41 0 x

NOTES.—*a*, 1 3h. 5m. 28s. and 3h. 9m. 30s. *b*, LN 3h. 23m. 51s. LE 3h. 24m. 5s. *c*, e E 3h. 7m. 18s. ? P.
d, e LE 3h. 18m. 42s. to L 5h. 16m. 0s. *e*, L 3h. 30m. 6s. and 3h. 36m. 36s. *f*, MN 3h. 38m. 0s.
ME 3h. 49m. 0s. *g*, 2°N 92°W. *h*, SR 3h. 28m. 56s. *i*, LN 3h. 36m. 41s.; LE 3h. 40m. 16s.
j, 1 3h. 23m. 30s. *k*, MN 3h. 24m. 27s.; ME 3h. 26m. 7s. *l*, O-C. +1568s. *m*, P recorded as *e*₁;
*e*₂ 3h. 20m. 7s.; *e*₃ 3h. 26m. 7s.; *e*₄ 3h. 30m. 7s.; *e*₅ 3h. 37m. 0s. *n*, 0s. ? *o*, O-C. +617s. *p*, 36s. ?
q, O-C. +519s. *r*, MN 4h. 31m. 37s.; ME 4h. 30m. 48s. *s*, O-C. -599s. *t*, c 3h. 23m. 37s.
u, c 3h. 29m. 0s. *v*, O-C. +3767s. *w*, O-C. +1165s. *x*, Hour marks missing.

1916. July 14d. 20h. 26m. 55s.

Epicentre 45°5N. 15°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		^a	^c	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Padova	V.	2.1	270	20 28 43	++ 75	---	20 20 17	+ 84	---	---	a
Rocca di Papa	Aga.	4.0	205	20 27 59	++ 2	---	20 28 43	---	---	20 29 24	
Pompeii	N. O.A.	4.8	181	20 28 28	++ 19	---	20 28 55	--- 12	29 29 30	20 30 30	
	E. O.A.	4.8	181	20 28 27	++ 18	---	20 29 0	--- 7	20 29 40	20 30 30	
Moncalheri	S.	5.1	269	20 28 5	+ 9	---	20 29 30	+ 15	20 30 23	---	b
Paris	---	9.1	296	---	---	---	20 31 1	0	---	---	
	---	9.1	296	20 29 21	+ 9	---	20 31 9	+ 8	20 32 0	20 33-34	
De Bilt	---	9.3	319	c 29 36	+ 20	---	c 31 16	+ 10	i 31 58	N 32 28	
Barcelona	Ma.	10.1	253	20 29 23	+ 3	---	---	---	20 32 12	N 34 45	
Shide	M.S.	12.0	301	---	---	---	20 32 31	+ 17	---	20 34 39	
	M.B.	12.0	301	---	---	---	---	---	---	20 34 39	
Stonyhurst	M.	13.9	312	---	---	---	---	---	---	20 36 12	
Edinburgh	M.	15.4	319	---	---	---	---	---	---	20 36 0	
Granada	E. C.	16.2	246	20 30 52	+ 2	---	i 34 7	+ 12	20 35 42	N 36 49	c
Pulkovo	G.	16.9	27	i 31 4	+ 5	---	i 34 22	+ 11	20 35 0	20 36 44	d
Rio Tinto	M.	17.8	252	20 38 0	e	---	---	---	---	20 40 0	
Coimbra	---	17.9	259	20 34 25	?	---	20 34 25	+ 2	20 37 9	---	
San Fernando	N. M.	18.3	248	20 34 30	f	---	20 34 30	--- 12	---	---	
Helwan	N. M.	20.2	135	20 43 0	f	---	---	---	---	---	
	E. M.	20.2	135	20 41 0	g	---	---	---	---	---	
Tiflis	G.	21.8	90	c 31 50	---	---	20 36 10	+ 14	20 42 0	---	
Ekaterinburg	G.	30.1	51	20 33 16	---	---	20 38 17	--- 14	20 42 30	---	h

NOTES.--a, P and S record reduced by 1h.
d, 46°0N. 12°0E. e, O-C +410s. b, MN 20h. 31m. 38s.; ME 20h. 30m. 57s.
MZ 20h. 46m. 3s. f, O-C +562s. g, O-C +682s. c, 48°8N. 13°2E.
h, ME 20h. 46m. 0s. and

9C

1916. July 16d. 18h. 14m. 21s.

Epicentre 38°5N. 146°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
				H. M. S.		H. M. S.	H. M. S.		H. M. S.	H. M. S.	
Mizusawa	N.	O.	3-8	274	18 15 10	- 12	18 15 30	- 38	---	---	
	E.	O.	3-8	274	18 15 9	- 13	18 15 30	- 38	---	---	
Osaka	O.	9-3	249	18 16 42	+ 1	---	? 18 13	- 19	a	b	b
Zi-ku-wei	W.	21-3	250	N 19 S	- 10	---	% 22 46	- 24			
Honolulu	M.	50-7	94	---	---	---	---	---	% 25 57	18 32 18	e
Ekaterinburg	G.	56-2	319	d 22 3	- 65	i 25 7	18 30 39	- 78	18 41 6	18 48 45	d
Batavia	W.	57-6	228	c 25 0	- 43	---	---	---	---	---	
Bombay	E.	M.	65-4	275	e	---	---	---	---	---	
Pulkevo	G.	68-5	331	i 25 33	+ 4	i 27 14	i 34 22	- 7	18 48 0	% 57 6	f
Makeyevka	G.	72-5	318	18 25 54	0	---	18 35 5	- 12	18 50 0	N 2 13	g
Tiflis	G.	72-5	310	18 25 54	0	---	18 35 8	- 9	18 53 0	19 0 10	
Edinburgh	M.	82-1	333	18 54 0	? L	---	---	---	18 54 0	19 10 0	
Eskdalemuir	G.	82-6	343	e 27 9	+ 5	---	? 37 10	- 12	18 53 0	---	i
Stonyhurst	M.	83-8	342	i 38 12	+ 5	---	18 38 12	- 45	19 5 18	---	
De Bilt	---	83-8	337	e 27 9	- 6	---	18 37 11	- 18	c 55 0	19 6 19	
Bidston	N.	M.S.	84-3	342	18 38 18	+ 5	18 38 18	+ 47	---	19 4 30	j
Shide	M.S.	86-3	340	18 27 15	- 1	---	18 37 42	- 12	18 56 0	19 14 30	
	M.B.	86-3	340	---	---	---	18 37 44	- 10	18 57 30	19 14 30	
Paris	---	86-9	337	18 27 20	- 1	---	18 37 44	- 17	19 0 0	19 8-9	
Ottawa	E.	B.	88-1	28	i 38 14	---	18 38 14	- 0	19 1 0	---	k
Helwan	E.	M.	88-1	308	18 37 0	+ 5	18 37 0	- 77	---	---	
Moncalieri	S.	88-5	332	18 37 37	+ 5	---	18 37 37	- 42	19 2 32	---	l
Rocca di Papa	Ag.	89-1	327	e 27 29	- 3	---	---	---	e 9 30	---	
Barcelona	Ma	93-5	334	---	---	---	---	---	c 7 23	19 15 53	m
Coimbra	---	98-0	341	---	---	---	---	---	n	---	
Granada	C.	99-3	336	---	---	---	---	---	19 7 42	19 21 6	
Rio Tinto	M.	99-7	338	19 8 0	+ 1	---	---	---	---	19 19 0	
San Fernando	N.	M.	100-8	338	19 6 30	0	---	---	p	19 19 30	
	E.	M.	100-8	338	---	---	19 12 30	q	---	19 20 30	
La Paz	---	143-0	64	18 34 42	+ 178	---	---	---	---	---	

Notes.—a, b, MN 18h. 19m. 39s.; ME 18h. 19m. 35s.; P given as PS and S given as L. c, ME 18h. 27m. 33s.; MN 18h. 27m. 41s. d, iR P?; i 18h. 30m. 59s. e, P 18h. 53m. to 59m. f, SR, 18h. 35m. 42s.; 44°0N, 153°0E. g, minute marks doubtful, P and S increased by 2m. h, MN 19h. 4m. 0s.; ME 19h. 3m. 0s. i, SR? 18h. 42m. 30s. j, S 18h. 47m. 30s. k, S? 18h. 42m. 57s. l, MN 19h. 13m. 44s.; ME 19h. 12m. 19s. m, c 19h. 2m. 0s. n, eL 19h. 6m. 45s. from Milan. o, O-C +227s. p, O-C +1836s. q, O-C +1930s.

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1916. July 27d. 11h. 52m. 29s.

Epicentre 4°0N. 97°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	N.	Notes Ref.
Batavia	W.	14.1	136	G. M. S.							
Colombo	M.	17.4	281	c 55 27	- 29					12 0 0	
Calcutta	N. O.E.	20.3	336	11 57 18	++ 39					11 58 42	
	E. O.E.	20.3	336	11 58 0	++ 46		12 1 24	+ 26			
Kodaikanal	M.	20.4	289	11 57 6	- 9					12 7 0	
Manila	W.	25.8	65	c 58 0	- 15		12 2 21	- 26	12 5 41	a	
Zi-ka-wei	W.	35.6	37	12 0 4	+ 27		e 5 52	+ 19		z 18 11	
Mauritius	M.	45.3	236	12 7 36	? S		12 7 36	- 12		b	
Melbourne	M.	61.0	138						e 9 6	12 12 6	
Makeyevka	G.	66.7	321	12 3 26	+ 1		12 12 8	- 7	12 21 0		
Hidwan	N. M.	66.9	301	12 13 0	+ S		12 13 0	+ 42		12 38 42	
	E. M.	66.9	301	12 4 0	+ 34						
Pulkovo	G.	75.0	331	i 4 17	- 1						
Rocca di Papa	N. Aga.	83.1	312	12 5 2	- 4		i 13 43	- 12	12 24 0	12 41 36 c	
	E. Aga.	83.1	312				12 15 19	- 8			
Moncalieri	S.	86.7	315	12 4 57	- 30		e 15 9	- 18			
De Bilt		88.0	317	12 5 26	- 8		12 15 43	- 24	12 25 18		
Paris		89.9	319	12 5 34	- 10		12 15 37	- 44		12 52 10	
		89.9	319				12 16 16	- 26	12 43 0		
Barcelona	Ma	91.0	312				12 15 46	- 56			
Slide	MS	92.1	321	12 5 43	- 13				e 16 25		d
Edinburgh	E. M.	92.3	326	12 16 0	? S		12 17 19	+ 14			
Stonyhurst	M.	92.3	324				12 16 0	- 67		13 1 0	
Eskdalemuir	G.	92.5	326							12 19 0	
Bidston	N. M.S.	92.7	324	12 16 48	? S						
San Fernando	N. M.	98.1	308	12 17 0	? S		12 16 48	- 23		12 48 36 f	
La Paz		100.8	224	12 12 30	+ 91		12 17 0	- 66			
							12 23 40	- 87	12 36 0	12 37 12	

NOTES.—a, MN 12h. 7m. 26s.; ME 12h. 6m. 22s. b, MN 12h. 18m. 0s.; ME 12h. 13m. 36s. c, SR₁ 12h. 18m. 48s.; SR₂ 12h. 21m. 48s.; double quake, P and S repeated in 13m.; 10°0N. 104°0E. d, i 12h. 17m. 16s. e, 12h. 17m. 0s. to 13h. 50m. 0s., no definite phases. f, S? 12h. 24m. 24s.

1916. August 3d. 1h. 30m. 2s.

Epicentre 4°08. 144°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	P ₁	S.		O-C.	L.		M.	Notes Ref.
				H. M. S.	S.			H. M. S.	S.		H. M. S.	H. M. S.		
Manila	W.	29.8	309	c 36 39	+	11	---	1 41 36	+	3	1 46 22	a		
Sydney	E.	30.5	169	---	---	---	---	1 32 0	---	---	1 39 0	b	42 c	
Aelaide	E.	31.4	189	1 36 18	+	26	---	---	---	---	1 40 51	---	46 6	
Melbourne	M.	33.8	179	1 37 12	+	7	---	1 41 48	---	51	1 43 30	---	50 18	
Batavia	W.	37.6	265	1 37 33	---	4	---	? 43 3	---	31	---	---	48 0	
Perth, W.A.	E.	38.8	221	1 36 28	---	78	1 42 6	---	---	---	1 50 30	---	53 48	
Osaka	O.	39.6	348	1 37 54	+	1	---	1 43 59	---	4	1 48 6	d		
Zi-ka-wei	W.	41.5	330	1 38 11	+	2	---	1 44 36	+	6	1 48 2	e	f	
Mizusawa	N.	43.2	356	1 38 21	---	1	---	1 44 52	---	3	---	---		
Calcutta	E.	43.2	356	1 38 21	---	1	---	1 44 52	---	1	---	---		
Honolulu	N.	60.9	298	1 40 36	+	16	---	1 49 0	+	23	---	---		
Colombo	E.	60.9	298	1 40 30	+	10	---	1 49 0	+	23	---	---		
Kodaikanal	M.	61.7	63	1 40 42	+	17	---	1 49 18	+	82	---	---	0 g	
Bombay	E.	65.5	279	1 40 48	+	2	---	---	---	---	1 50 18	---	51 48	
Ekaterinburg	M.	68.3	283	1 42 6	+	58	---	---	---	---	1 51 0	---	52 12	
Victoria, B.C.	E.	74.1	291	1 42 21	+	36	---	---	---	---	---	---	49	
Berkeley	E.	90.0	327	1 43 6	---	12	1 46 50	1 53 26	---	50	2 10 0	---	19 1	
Lick	W.	94.4	42	? 43 30	---	12	---	1 47 30	h	---	1 53 24	---	54 i	
Makeyevka	G.	94.9	52	? 47 1	+	195	---	1 53 50	---	77	e 1 2	---		
Pulkovo	G.	95.5	53	c 47 23	+	215	---	---	---	---	---	---		
Helwan	E. N.	101.0	319	c 44 17	---	15	---	c 55 47	---	48	2 20 0	---	45 j	
Capetown	E.	105.5	327	1 44 21	---	18	1 48 39	1 56 14	---	35	2 15 0	---	17 59	
De Bilt	Ma.	112.0	361	1 50 0	+	291	---	---	---	---	---	---	55 42	
Padova	V.	116.5	229	1 55 12	+	k	---	1 59 42	+	78	---	---	24	
Edinburgh	E.	120.7	340	c 51 34	+	346	---	1 1 41	+	164	2 22 19	---	34 29 l	
Rocca di Papa	Aga.	121.4	332	c 49 12	+	201	1 50 50	2 1 3	+	120	c 30 0	---	32 13	
Stonyhurst	M.	121.6	323	1 49 28	+	216	---	1 59 32	+	29	2 35 56	---	0 27 m	
Bidston	M.	122.1	339	2 0 0	+	S	---	2 0 0	+	53	---	---	31 18	
Toronto	M.	122.5	339	c 50 34	+	237	1 54 21	2 1 7	+	117	---	---	n	
Kew	M.	122.8	319	c 49 0	+	182	---	---	---	---	c 22 17	---	o	
	M.	123.4	337	1 52 p	+	389	---	---	---	---	---	---	38 q	
	M.	123.9	337	1 51 7	+	304	---	2 2 r	+	170	---	---		
	M.	124.0	37	---	---	---	---	---	---	---	1 47 15	---		
	M.	124.2	331	---	---	---	---	---	---	---	---	---	2 22 0	

09

Moucalieri	S.	124.3	320	e 48 59	+ 174	—	1 58 47	- 36	2 8 20	2 38 40
Paris	M.S.	124.8	326	i 49 9	+ 182	—	2 1 0	+ 96	2 21 0	2 39 34
Shide	M.S.	125.2	334	i 51 3	+ 294	1 52 26	? 1 5	+ 96	2 29 0	2 35 5
Ottawa	B.	125.8	34	—	—	—	—	—	e 8 12	—
Washington	—	128.7	42	e 46 16	- 8	—	—	—	e 3 23	—
	—	128.7	42	c 46 49	+ 25	—	—	—	e 3 23	—
Barcelona	Ma.	129.7	323	—	—	—	i 52 45	u	e 3 50	—
Granada	C.	135.8	323	i 48 30	+ 95	1 51 44	—	—	2 29 0	2 40 12
Coimbra	N. W.	136.3	330	—	—	1 52 59	? 55 17	-307	2 27 0	2 44 0
	E. W.	136.3	330	e 49 17	+ 140	1 53 9	? 54 37	-367	2 34 0	2 45 9
San Fernando	N. M.	137.9	324	i 49 0	+ 115	—	—	—	2 40 30	—
	E. M.	137.9	324	i 50 30	+ 205	—	—	—	2 40 0	3 25 0
La Paz	—	141.8	123	e 49 35	+ 135	1 53 12	e 4 50	+214	2 36 0	N 9 0
Azores	M.	145.1	346	i 50 18	+ 165	—	—	—	—	2 14 12

NOTES.—*a*, MN 1h. 48m. 7s.; ME 1h. 48m. 9s. *b*, O-C -585s. *c*, SR, 1h. 35m. 30s. *d*, MN 1h. 50m. 26s.; ME 1h. 48m. 29s. *e*, MN 1h. 50m. 34s.; ME 1h. 52m. 18s. *f*, PS 1h. 45m. 32s. *g*, S given as L.
h, O-C -452s. *i*, SN also 1h. 53m. 50s. *j*, 1h. 48m. 42s. *k*, O-C +583s. *l*, ISR 2h. 5m. 41s.
m, Records diminished by 1hr. *n*, ME 2h. 32m. 3s.; MN 2h. 32m. 13s. *o*, SR 2h. 8m. 3s. *p*, P30s.?
q, M 0s.? *r*, S 10s.? *s*, i 1h. 51m. 33s. and 2h. 1m. 32s. *t*, Ma instrument shows e at 1h. 46m. 24s. and
SR at 1h. 52m. 56s. *u*, O-C -436s. *v*, e 1h. 49m. 18s. *w*, PR also 1h. 52m. 20s.; 1h. 57m. 43s., and
2h. 0m. 20s.; P-4S. 145°5E.

1916. August 8d. 4h. 24m. 33s.

Epicentre 36°0N. 139°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.		PR ₁		S.		O-C.		L.		M.		Notes Ref.
				H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	H. M. S.	H. M. S.	S.			
Osaka	O.	3-0	248	—	—	—	—	—	—	—	—	—	—	4 27 10	—	—	—	a
Mizusawa	O.	3-5	28	4 25 19	—	9	—	—	—	4 26 7	—	—	—	—	—	—	—	
Zi-ka-wei	O.	15-4	28	4 25 21	—	7	—	—	—	4 26 7	—	—	—	—	—	—	—	
Manila	W.	26-8	257	4 28 34	+	17	—	—	—	e 31 45	+	31	—	—	—	—	—	
Batavia	W.	51-9	222	e 30 28	—	1	—	—	—	—	—	—	—	—	—	—	—	
Batavia	W.	51-9	222	e 34 0	+	8	—	—	—	—	—	—	—	—	—	—	—	
Ekaterinburg	G.	54-5	319	i 33 59	—	10	—	—	—	i 41 33	—	15	—	4 50 0	—	4 42 0	—	d
Honolulu	M.	56-2	87	—	—	—	—	—	—	—	—	—	—	4 40 30	—	4 59 48	—	
Bombay	M.	60-1	273	4 59 59	—	—	—	—	—	—	—	—	—	—	—	5 3 54	—	
Kodaikanal	M.	61-1	261	5 4 36	—	—	—	—	—	—	—	—	—	—	—	—	—	
Pulkovo	G.	67-9	329	i 35 36	—	0	—	—	—	—	—	—	—	—	—	—	—	
Makyeveka	G.	70-5	316	? 33 53	—	0	—	—	—	4 38 8	—	—	—	4 41 34	—	4 56 0	5 8 2	h
Edinburgh	G.	82-7	340	4 47 0	—	—	—	—	—	—	—	—	—	—	—	—	—	
Edinburgh	M.	82-7	340	4 47 0	—	—	—	—	—	—	—	—	—	—	—	—	—	
Edinburgh	G.	83-2	339	4 37 3	—	7	—	—	—	4 40 39	—	—	—	—	—	—	—	
De Bilt	—	83-2	333	4 37 7	—	4	—	—	—	—	—	—	—	—	—	—	—	
Stonyhurst	M.	84-2	337	i 47 24	—	—	—	—	—	—	—	—	—	—	—	—	—	
Bidston	M.	84-8	338	4 37 14	—	6	—	—	—	4 40 24	—	—	—	—	—	—	—	
Helwan	N.	85-4	304	4 49 0	—	—	—	—	—	—	—	—	—	—	—	—	—	
Helwan	M.	85-4	304	4 49 0	—	—	—	—	—	—	—	—	—	—	—	—	—	
Kew	M.	85-6	336	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Shide	M.S.	86-6	336	4 37 21	—	6	—	—	—	—	—	—	—	—	—	—	—	
Paris	—	86-8	333	4 37 21	—	10	—	—	—	—	—	—	—	—	—	—	—	
Moncalieri	—	87-8	328	e 43 56	—	—	—	—	—	—	—	—	—	—	—	—	—	
Rocca di Papa	Aga.	88-0	323	e 37 10	—	28	—	—	—	—	—	—	—	—	—	—	—	
Ottawa	B.	92-7	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Barcelona	Ma.	93-1	329	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Coimbra	—	98-2	336	q 42 0	+	206	—	—	—	—	—	—	—	—	—	—	—	
Granada	C.	99-1	331	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Rio Tinto	M.	99-7	333	5 16 0	—	—	—	—	—	—	—	—	—	—	—	—	—	
San Fernando	N.	100-7	332	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
San Fernando	M.	100-7	332	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Ia Paz	—	149-0	58	i 44 26	+	126	—	—	—	—	—	—	—	—	—	—	—	

NOTES.—*a*, *e* (PS) 4h. 25m. 56s. *b*, PMZ 4h. 29s. 3s. *c*, MN 4h. 34m. 38s.; ME 4h. 34m. 45s.; MZ 4h. 35m. 29s. *d*, 37°1N.; 139°1E. *e*, 7 swells. *f*, O-C +1512s. *g*, O-C +1783s. = M? *h*, PR₁ 4h. 39m. 46s.; SR₁ 4h. 48m. 48s.; SR₂ 4h. 52m. 0s.; 35°0N. 138°0E. *i*, Time marks uncertain. *j*, SR 4h. 53m. 29s. *k*, SR 4h. 53m. 25s.; SR₂ 4h. 57m. 0s. *l*, M 5h. 11m.-12m. and 5h. 19m.-20m. *m*, O-C +379s. *n*, O-C +388s. *o*, MN 5h. 20m. 43s.; ME 5h. 26m. 8s. *p*, LE 5h. 15m. 0s. and 5h. 23m. 0s. *q*, *?*e = P. *r*, eLN 5h. 16m. 0s.; eLE 5h. 11m. 0s. *s*, MN 5h. 26m. 0s.; ME 5h. 27m. 40s. *t*, e 4h. 42m. 30s. *u*, O-C = 2238s.

1916. August 8d. 18h. 53m. 1s.

Epicentre 18°·5N. 120°·0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁			S.	O-C.	I.			M.	Notes Ref.	
				H.	M.	S.	S.	H.	M.	S.	H.	M.	S.	H.	M.	S.		
Manila	W.	1·0	166	c	54	15	+ 12	---	---	---	---	---	18	55	9	---	---	
Zi-ka-wei	W.	12·8	4	18	56	7	+ 4	---	---	18	58	58	+ 18	6	---	---	---	
Osaka	O.	21·3	37	18	58	1	+ 3	---	---	---	---	---	---	---	---	19	10	51
Mizusawa	N.	27·6	37	18	58	49	---	---	---	19	3	24	---	---	---	---	---	
	E.	27·6	37	18	58	51	---	---	---	19	3	30	---	---	---	---	---	
Batavia	W.	27·9	209	e	39	0	---	---	---	---	---	---	---	---	---	19	6	0
Ekaterinburg	G.	58·0	326	i	2	54	---	---	---	19	10	57	---	---	---	19	29	4
Makeyevka	G.	71·1	315	---	---	---	---	---	---	---	---	---	---	---	---	19	38	54
Pulkovo	G.	73·9	328	i	4	16	+ 4	---	---	19	14	16	+ 2	---	---	19	40	11
Helwan	N.	79·7	298	19	13	0	---	---	---	---	---	---	---	---	---	---	---	
	E.	79·7	298	19	15	0	c	---	---	---	---	---	---	---	---	---	---	
De Bilt	---	88·8	326	---	---	---	---	---	---	19	16	39	---	---	---	19	46	23
Moncalieri	S.	91·7	319	e	15	36	? S	---	---	? 15	36	---	---	---	---	19	41	23
Eskdalemuir	G.	92·0	331	i	6	16	---	---	---	i	16	50	---	---	---	19	41	0
Kew	M.	92·8	327	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Paris	---	92·8	327	---	---	---	---	---	---	---	---	---	---	---	---	19	53	0
Bidston	N.	93·1	330	19	6	20	---	---	10	8	19	16	---	---	---	19	44	45
Rio Tinto	M.	104·6	319	19	24	24	g	---	---	? 24	24	---	---	---	---	19	51	0
La Paz	---	172·0	79	19	18	37	j	---	---	---	---	---	---	---	---	20	1	0

NOTES.—*a*, I 19h. 2m. 6s. and 19h. 2m. 14s. *b*, PR₂ 19h. 9m. 18s.; SR₁ 19h. 19m. 14s.; PS 19h. 15m. 8s. *c*, O-C +2382s.
d, O-C +2262s. *e*, MN 19h. 54m. 33s.; ME 19h. 48m. 58s. *f*, i also 19h. 10m. 0s.; ME 19h. 43m. 31s. and MN 19h. 43m. 43s. *g*, P O-C +1070s. *h*, S O-C +397s. *i*, P O-C +2787s. - L?
j, P O-C +388s.

1916. August 16d. 7h. 6m. 15s.

Epicentre 44°5N. 11°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
				H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Moncalieri	N.	2.7	276	7 7 24	+ 27	---	7 8 16	+ 46	7 8 48	---	a
Rocca di Papa	---	2.8	161	7 7 28	- 1	---	7 7 29	- 3	---	---	N 9 0
Monte Cassino	---	3.5	150	7 7 5	- 5	---	---	---	---	---	7 8 40
Pompeii	N. E.	1.4	119	7 7 23	- 0	---	7 7 16	- 30	7 8 16	---	7 9 6 b
Paris	---	4.4	149	7 7 24	- 1	---	7 7 48	- 28	---	---	7 9 20
Barcelona	E.	7.5	308	7 7 49	- 1	---	7 10 9	+ 30	7 10 48	---	7 12-13
De Bilt	Ma.	7.5	250	7 8 25	++ 16	---	---	---	7 10 17	---	c
Shide	M.S.	8.9	334	7 8 44	++ 15	---	7 10 34	++ 19	7 10 17	7 11 6	7 14 33
West Bromwich	M.B.	10.6	310	7 9 8	++ 15	---	7 11 27	++ 28	---	---	7 15 30
Stonyhurst	M.	12.0	317	7 9 11	++ 18	---	7 11 25	++ 26	---	---	7 15 30
Bidsfon	M.	13.0	321	7 9 22	++ 8	---	7 11 47	++ 13	---	---	7 15 6
Granada	C.	13.0	318	7 9 35	+ 7	---	7 12 13	+ 14	---	---	d
Eskdalemuir	G.	13.5	243	7 5 42	+ 233	---	7 8 31	+ 220	7 10 36	---	N 14 6
Rio Tinto	G.	14.3	324	7 9 57	+ 12	---	7 13 50	+ 80	---	---	7 16 35
Coimbra	M.	15.2	291	7 12 0	? S	---	7 12 0	- 52	---	---	7 19 0
San Fernando	N. E.	15.3	257	e 10 16	++ 18	---	7 13 34	++ 40	7 15 44	---	7 16 20
Pulkovo	G.	15.3	257	7 10 10	+ 12	---	7 13 40	+ 46	7 15 48	---	7 17 40
Helwan N. and E.	M.	15.6	245	---	---	---	7 12 0	- 55	7 14 30	---	7 17 0
Tiflis	G.	19.0	30	e 10 41	- 3	---	---	---	7 15 0	---	7 16 30
Azores	G.	19.0	30	i 10 44	0	---	14 14	- 3	7 17 0	---	7 18 50 e
Irkutsk	M.	21.4	127	7 16 0	? S	---	7 16 0	+ 53	---	---	7 24 46 f
Toronto	G.	24.3	85	7 11 35	- 11	---	7 15 48	- 17	7 19 18	---	---
Victoria, B.C.	M.	28.6	268	7 22 0	g	---	---	---	---	---	E 44 28
	G.	57.8	46	7 15 57	- 16	---	7 24 11	0	7 38 0	---	7 44 24
	M.	61.6	305	---	---	---	---	---	7 44 24	---	7 52 24
	M.	79.0	351	7 50 24	h	---	---	---	---	---	---

Notes.—a, MN 7h. 10m. 9s.; ME 7h. 10m. 19s. b, L 28. c, MN 7h. 13m. 12s.; ME 7h. 12m. 44s. d, circa 7h. 15m.
 e, 44°5N. 11°5E. f, 39°6N. 14°0E. and 35°7N. and 13°9E. (the record is 73°9E.)
 g, O-C +571s.
 h, O-C -1916s.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁		S.		O-C.	L.		M.	Notes Ref.
				H.	M.	S.	H.	M.	S.	H.	M.	S.	H.	M.	
La Paz	—	6-8	314	i	45	49	+	9	—	—	—	—	—	—	—
Washington E.	—	62-7	350	e	53	20	—	66	—	—	—	—	—	—	—
Ottawa	—	68-9	353	9	55	13	+	6	—	—	—	—	—	—	—
Capetown	M.	73-1	120	9	56	36	+	62	—	—	—	—	—	—	—
San Fernando N.	M.	82-0	45	9	56	48	+	21	—	—	—	—	—	—	—
Rio Tinto	M.	82-5	43	9	58	0	+	90	—	—	—	—	—	—	—
Granada	C.	83-6	45	9	56	59	+	22	—	—	—	—	—	—	—
Victoria, B.C.	M.	87-9	326	?	56	18	—	43	—	—	—	—	—	—	—
Coimbra N.	—	88-3	40	9	56	52	—	12	—	—	—	—	—	—	—
Barcelona	Ma.	90-2	44	e	57	42	+	28	—	—	—	—	—	—	—
Bidston	M.S.	93-8	32	9	57	36	+	2	10	2	6	10	8	12	—
Paris	—	94-2	38	e	57	41	+	5	—	—	—	—	—	—	—
Stonyhurst	M.	94-3	32	e	57	24	—	13	—	—	—	—	—	—	—
Eskdalemuir	G.	94-9	31	e	57	44	+	5	10	1	35	10	8	23	—
Edinburgh	M.	95-1	30	10	1	0	+	200	—	—	—	—	—	—	—
Honolulu	M.	96-9	250	10	0	0	+	110	—	—	—	—	—	—	—
De Bilt	—	97-3	36	9	58	1	+	24	10	2	5	10	9	24	—
Rocca di Papa	Aga.	97-4	48	9	58	3	+	10	—	—	—	—	—	—	—
Monte Cassino	—	97-9	48	9	58	10	+	14	—	—	—	—	—	—	—
Helwan	M.	107-3	116	10	3	0	+	257	—	—	—	—	—	—	—
Melbourne	M.	112-7	206	10	10	18	?	S	—	—	—	—	—	—	—
Pulkovo	G.	113-0	33	9	59	6	—	2	10	3	49	10	10	18	—
Adelaide	M.	117-7	203	10	10	36	?	S	—	—	—	—	—	—	—
Tiflis	G.	120-1	54	e	3	15	+	215	—	—	—	—	—	—	—
Ekaterinburg	G.	129-0	34	?	1	11	+	51	—	—	—	—	—	—	—
Bombay	M.	141-7	90	10	7	6	+	j	—	—	—	—	—	—	—
Kodakkanal	M.	143-1	102	10	15	30	?	S	—	—	—	—	—	—	—
Colombo	M.	143-1	111	10	4	24	+	183	—	—	—	—	—	—	—
Batavia	W.	150-0	165	e	4	17	+	149	—	—	—	—	—	—	—
Irkutsk	G.	150-1	12	e	4	18	+	139	—	—	—	—	—	—	—
Mizusawa E.	—	152-1	311	10	4	4	+	127	—	—	—	—	—	—	—
Osaka	O.	158-1	306	10	4	12	+	101	—	—	—	—	—	—	—
Manila	W.	170-2	317	e	4	49	+	98	—	—	—	—	—	—	—
Zi-ka-wei	—	170-2	325	e	15	56	?	S	—	—	—	—	—	—	—

NOTES.—*a*, S? 10h. 7m. 14s.; iSE 10h. 7m. 50s.; LE 10h. 19m. 50s.; ME 10h. 27m. 14s. *b*, given as L. *c*, L₂.
d, MN 10h. 26m. 13s. and 10h. 34m. 33s.; ME 10h. 35m. 3s. *e*, M 10h. 41m. 0s. and 10h. 54m. 0s.
f, e(S)E 10h. 8m. 39s.; e(S)N 10h. 8m. 46s. *g*, eP 10h. 35m. 48s.; M 10h. 48m. 30s. *h*, iPS 10h. 14m. 3s.;
SR₁ 10h. 18m. 0s.; SR₂ 10h. 22m. 30s. *i*, i, 10h. 16m. 40s. *j*, O-C + 3558. *k*, recorded as P₂.
l, e₂ 10h. 7m. 49s.; MV 11h. 6m. 1s. *m*, MN 11h. 10m. 35s.; ME 11h. 11m. 8s.

1916. August 27d. 22h. 42m. 29s.

Epicentre 37°5N. 142°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁			S.			O-C.	L.			M.			Notes Ref.			
				H.	M.	S.	S.	H.	M.	S.	H.	M.	S.	S.	H.	M.	S.	H.	M.	S.				
Mizusawa	N. O.	2-0	327	22	42	59	- 1	---	22	43	24	+ 1	---	---	---	---	---	---	---	---	---			
	E. O.	2-0	327	22	43	0	---	---	22	43	25	0	---	---	---	---	---	---	---	---	---			
Osaka	O.	6-3	248	a	44	4	- 1	---	---	---	---	---	22	45	19	---	---	---	---	---	b			
Zi-ka-wai	W.	18-5	256	22	46	41	- 11	---	---	e	50	9	- 11	---	---	---	---	---	---	---	E 54 29			
Manila	W.	29-8	226	c	48	46	- 9	---	---	---	---	---	---	---	---	---	---	---	---	---	N 57 10			
Irkutsk	G.	30-4	312	22	47	38	- 83	---	---	e	52	32	- 98	22	57	0	---	---	---	---	Z 59 56			
Honolulu	M.	53-4	88	22	57	54	? S	---	---	22	57	54	- 96	23	16	18	---	---	---	---	23 24 6			
Batavia	W.	54-9	225	e	52	0	- 7	---	---	e	59	0	- 49	---	---	---	---	---	---	---	23 1 0			
Ekatereburg	G.	55-2	319	i	50	55	- 74	22	52	59	i	58	33	- 80	23	10	0	---	---	---	---	23 16 22 c		
Pulkovo	G.	68-0	330	22	53	52	+ 19	22	56	30	23	2	48	+ 17	23	16	0	---	---	---	---	d		
Edinburgh	E. M.	82-2	341	23	26	0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	23 35 0		
Eskdalemuir	G.	82-6	341	e	55	1	- 2	---	---	? 5	12	---	- 10	---	---	---	---	---	---	---	---	23 36 35		
De Bilt	---	83-0	335	---	---	---	---	---	---	23	5	15	- 11	e	23	22	---	---	---	---	---	23 34 56		
Stonyhurst	M.	83-8	340	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	g		
Bidston	N. M.S.	84-3	340	22	55	6	- 7	---	---	23	5	12	- 28	---	---	---	---	---	---	---	---	23 35 18 h		
Kew	M.	85-3	338	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	23 38 0		
Shide	M.S.	86-2	338	---	---	---	---	---	---	23	5	35	- 26	23	24	0	---	---	---	---	---	---	23 33 30	
Paris	---	86-7	335	22	55	15	+ 11	---	---	23	5	36	- 31	23	28	0	---	---	---	---	---	---	N 36-37	
	---	86-7	335	22	55	28	+ 2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	E 39 40	
Helwan	N. M.	86-8	306	23	6	0	? S	---	---	23	6	0	- 8	---	---	---	---	---	---	---	---	---	---	
	E. M.	86-8	306	23	6	0	? S	---	---	23	6	0	- 8	---	---	---	---	---	---	---	---	---	---	---
Rocca di Papa	Aga.	88-5	325	e	55	20	- 17	---	---	e	4	31	- 116	e	33	6	---	---	---	---	---	---	---	
Ottawa	N. B.	90-3	26	---	---	---	---	---	---	c	6	0	- 46	23	37	0	---	---	---	---	---	---	---	i
Toronto	M.	90-4	29	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Barcelona	Ma.	93-2	351	---	---	---	---	---	---	---	---	---	---	---	---	---	e	33	52	---	---	---	---	
Colmbra	N.	97-9	338	---	---	---	---	---	---	---	---	---	---	---	---	---	c	34	0	---	---	---	---	
Granada	G.	99-0	333	---	---	---	---	---	---	---	---	---	---	---	---	---	23	30	0	---	---	---	23 36 36	
Rio Tinto	M.	99-5	336	23	7	0	? S	---	---	23	7	0	- 80	---	---	---	---	---	---	---	---	---	23 51 0	
San Fernando	N. M.	100-6	335	22	58	30	+ 108	---	---	23	19	0	---	---	---	---	23	43	30	---	---	---	---	
	E. M.	100-6	335	---	---	---	---	---	---	---	---	---	---	---	---	---	23	43	0	---	---	---	23 51 0	
La Paz	---	145-8	61	i	2	17	+ 134	---	---	---	---	---	---	---	---	---	N	37	0	---	---	---	---	

NOTES.—a, P given as (PS). b, MN 22h. 46m. 47s.; ME 22h. 46m. 11s. c, 36°4N. 139°3E.
d, SR, 23h. 7m. 0s. e, O-C +1860s. f, L 23h. 27m. 0s. and 23h. 21m. 0s. g, M 23h. 6m. 0s. and
23h. 36m. 6s. h, eP 23h. 21m. 12s.; iP 23h. 28m. 36s. i, eE 23h. 5m. 28s.; iE 23h. 7m. 34s.
j, 22h. 59m. 0s. and 23h. 4m. 36s. k, O-C +630s.

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1916. August 23d. 6h. 39m. 29s.

Epicentre 30°0N. 81°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁	S.		O-C.	L.	M.	Notes Ref.
				H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.			
Calcutta	N. O.E.	10-0	137	6 42 6	+	7	---	6 43 48	-	10	---	---	---
Bombay	E. M.	13-4	216	6 42 47	+	0	---	---	---	---	---	6 47 55	---
Kodaikanal	M.	20-1	190	6 44 36	+	25	---	---	---	---	6 47 36	6 52 0	---
Colombo	E. M.	23-1	183	6 45 30	+	43	---	6 46 24	-	152	6 49 12	6 52 48	---
Irkutsk	G.	28-1	31	i 45 37	-	1	---	i 50 30	0	0	6 55 0	z 57 20	a
Ekatereburg	G.	30-3	338	i 44 46	-	74	---	i 49 44	-	83	---	---	---
Tiflis	G.	31-3	302	i 46 1	-	9	---	i 51 7	-	18	6 55 0	7 1 25	b
Zi-ka-wei	W.	34-6	78	i 46 35	-	4	---	6 52 4	-	14	e 56 52	c	d
Manila	N. W.	39-8	104	e 47 17	-	5	---	---	---	---	---	---	---
Hetwan	E. M.	42-6	282	6 48 12	+	28	---	6 54 12	0	0	---	7 7 36	---
Batavia	N. M.	42-6	282	6 48 6	+	22	---	6 54 12	0	0	---	7 11 36	---
Pulkovo	E. W.	43-9	141	i 47 48	-	6	---	i 54 11	-	19	---	6 59 0	f
Osaka	G.	44-9	326	i 47 57	-	4	6 49 44	i 54 30	-	13	7 0 0	7 7 45	g
Mizusawa	O.	45-7	69	6 48 5	-	2	---	6 54 42	-	11	7 0 44	---	---
Pompeii	N. O.	49-5	62	6 48 32	-	1	---	6 55 39	-	3	---	---	---
Monte Cassino	E. O.	49-5	62	6 48 35	-	2	---	6 55 43	+	1	---	---	---
Padova	N. O.A.	53-9	301	6 49 10	+	9	---	---	---	---	---	---	---
Monte Cassino	N. ---	54-3	302	6 49 7	+	3	---	---	---	---	---	6 56 50	---
Padova	V.	55-0	307	6 48 58	-	10	---	6 56 38	-	12	---	6 56 55	---
Rocca di Papa	Aga.	55-1	302	6 49 10	+	1	---	6 56 45	-	6	c 3 48	7 19 0	---
De Bilt	---	58-4	316	i 49 39	+	9	---	i 57 37	+	4	7 11 0	7 17 30	---
Paris	---	60-6	312	6 49 52	+	7	6 55 37	6 58 5	+	5	7 7 0	7 18-21	---
Dyce, Aberdeen	Ma.	61-5	322	6 50 23	+	32	---	6 58 18	+	7	7 4 3	7 14 13	---
Kew	M.	61-7	316	6 50 0	+	8	---	---	---	---	---	7 21 0	---
Stanhurst	M.	62-4	318	6 49 30	+	27	---	i 49 30	?	P	---	7 22 30	---
Eskdalemuir	M.S.	62-5	320	6 50 4	+	6	---	---	---	---	---	---	---
West Bromwich	G.	62-5	320	6 50 5	+	7	---	---	---	---	---	7 19 37	---
Shide	M.	62-5	317	6 50 3	+	5	---	6 58 21	-	3	---	---	---
Barcelona	M.S.	62-5	315	6 50 5	+	7	---	6 58 20	-	4	---	7 20 30	---
Bidston	Ma.	62-8	304	i 50 7	+	7	---	i 58 34	+	7	e 12 33	---	---
Bidston	M.S.	62-9	318	6 50 11	+	11	---	6 58 40	+	11	---	---	---
Granada	C.	65-4	301	i 50 34	-	2	---	i 59 29	-	7	7 10 0	E 29 30	j
Perth, W.A.	E. M.	70-2	149	6 57 0	+	L	---	---	---	---	7 25 30	7 37 0	---
Rio Tinto	M.	70-4	308	6 52 0	+	72	---	---	---	---	---	7 35 0	---

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San Fernando	N.	M.	70.6	302	6 51 0	+ 10	---	7 0 0	- 2	7 20 30	7 28 0
Coimbra	E.	M.	70.6	302	6 51 0	+ 10	---	7 0 0	- 2	7 21 0	7 34 0
Azores			70.7	307	1 50 57	+ 7	---	7 0 11	+ 8	7 20 20	<i>l</i>
Adelaide	E.	M.	83.7	310	6 52 0	- 9	---	---	---	---	7 34 30
Capetown	E.	M.	84.6	136	7 2 30	? S	---	7 2 30	- 14	---	7 31 30
Melbourne		M.	87.0	228	6 50 42	- 106	---	7 2 30	- 40	7 22 42	7 40 24
Sydney	E.	M.	90.4	135	---	---	---	---	---	<i>i</i> 3 6	7 3 24 <i>t</i>
Victoria, B.C.		M.	92.0	129	7 3 12	? S	---	7 3 12	- 52	7 33 36	7 36 15
Ottawa		M.	98.6	16	7? 2 42	<i>n</i>	---	7 14 36	<i>o</i>	? 26 0	7 44 12
Toronto		B.	101.6	343	---	---	---	<i>i</i> 57 45	<i>p</i>	<i>q</i>	---
Washington	N.		104.1	346	---	---	---	7 5 36	- 27	7 26 54	7 43 54
Berkeley	E.		108.1	342	e 59 38	+ 320	---	7 7 35	+ 55	e 22 18	---
La Paz		W.	108.6	19	e 58 30	+ 250	---	7 7 35	+ 55	e 22 18	---
			118.7	289	i 59 31	+ 136	---	c 15 14	+ 234	7 49 0	N 10 12 <i>s</i>

NOTES.—*a*, 29°-9N, 86°-9E. *b*, 28°-7N, 78°-0E. *c*, MN 7h. 2m. 20s.; ME 7h. 1m. 52s. *d*, SRN 6h. 55m. 55s.; SRE 6h. 55m. 45s. *e*, MN 7h. 9m. 6s.; ME 7h. 9m. 17s. *f*, ML 7h. 14m. 0s. *g*, SR₁ 6h. 57m. 42s.; 32°-0-N, 82°-0E. *h*, MN 7h. 5m. 56s.; ME 7h. 9m. 11s. *i*, M 13m? *j*, 37°-3N, 83°-4E. *k*, O-C +373s. *l*, MN 7h. 21m. 54s. and 7h. 26m. 39s.; ME 7h. 27m. 57s. *m*, iN 7h. 6m. 25s.; iE 7h. 0m. 23s. *n*, O-C +550s. *o*, O-C +565s. *p*, O-C -475s. *q*, eL 7h. 24m. 18s.; L 7h. 27m. 0s., and 7h. 40m. 0s. *r*, iR 7h. 4m. 38s.; e 6h. 53m. 51s. *s*, i 7h. 11m. 11s. *t*, The Melbourne records are printed as assigned by the Observatory, but it seems probable that they refer to S; the tabular error, O-C, being -41s. and -23s. Melbourne also gives the following records, which appear to refer to another quake: P 7h. 17.7m., S 7h. 21.7m., L 7h. 38.2m., M 7h. 40.3m., SR₁ 7h. 31.2, SR₂ 7h. 33.4m.

1916. September 3d. 7h. 13m. 17s.

Epicentre 7°0S. 155°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.	
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.		
Sydney	E. M.	27.1	187	7 18 12	- 65	---	7 23 48	- 12	7 23 48	7 26 0		
Adelaide	E. M.	31.8	206	7 20 30	+ 28	---	---	---	7 25 30	7 34 30		
Melbourne	M.	32.1	195	i 24 36	+ 271	---	---	---	7 30 0	7 33 18	b	
Manila	W.	40.1	303	e 21 12	- 1	---	7 24 48	- 39	7 32 45	e		
Perth, W.A.	E. M.	44.1	230	7 28 0	? 26 1	? 31 18	7 27 17	- 8	7 32 45	7 41 0	d	
Osaka	O.	45.6	337	7 21 53	- 1	---	7 28 0	- 20	7 36 54			
Mizusawa	N. O.	47.9	345	7 22 1	- 9	---	---	---	7 33 3			
	E. O.	47.9	345	7 22 15	+ 5	---	7 29 0	- 10	---			
Batavia	W.	47.9	267	e 22 23	+ 13	---	7 29 1	- 9	---	7 34 0		
Zi-ka-wei	W.	49.9	322	e 22 28	+ 5	---	i 29 24	+ 14	7 34 13	e		
Honolulu	M.	54.2	57	7 23 6	+ 15	---	e 29 12	+ 7	7 42 0	7 46 48		
Irkutsk	G.	73.3	330	7 25 2	+ 7	---	? 31 0	+ 32	---	N 49 36		
Bombay	E. M.	85.0	290	7 36 0	? 26 7	---	7 34 28	+ 6	---			
Berkeley	---	88.6	52	---	---	---	7 36 0	- 36	---			
Victoria, B.C.	M.	89.8	41	7 37 48	? 26	---	---	---	7 37 48	+ 19	7 42	j
Mauritius	M.	94.3	249	---	---	---	7 37 48	+ 19	7 42	8 4 6	h	
Ekarerinburg	G.	98.2	326	i 27 2	- 16	7 31 5	7 38 34	- 21	7 51 0	8 14 55	i	
Tiflis	G.	109.7	312	---	---	---	---	---	s 5 0	8 12 24	j	
Pulkovo	G.	113.0	333	7 28 20	- 8	7 32 56	7 40 48	- 23	8 3 0	8 8 9	k	
Toronto	M.	120.1	43	---	---	---	---	---	l	8 28 12		
Ottawa	B.	121.9	40	---	---	---	7 43 51	+ 91	m	---	a	
Capetown	E. M.	121.9	222	8 16 0	o	---	---	---	---	---		
Helwan	N. M.	122.5	301	7 44 0	p	---	---	---	---	---		
	E. M.	122.5	301	7 33 0	+ 228	---	---	---	---	---		
Edinburgh	E. M.	128.1	345	7 45 0	? 26	---	? 45 0	+ 115	---	8 31 30		
Wskdalemuir	G.	128.7	344	7 34 36	+ 297	---	---	---	---	8 18 0		
	G.	128.7	344	7 36 8	+ 387	---	---	---	---	8 33 30		
Bidston	N. M.S.	130.3	343	7 34 12	+ 266	---	7 40 24	- 176	---	8 41 0		
Key	M.	131.1	340	---	---	---	---	---	---	8 18 30		
La Paz	---	131.3	119	7 32 46	+ 176	7 36 20	---	---	z 15 0	8 18 30		
Rocca di Papa	---	131.7	322	e 32 21	+ 151	7 32 51	7 48 3	+ 274	z 13 24	8 35 0		
Shide	M.S.	132.0	340	7 31 46	+ 113	---	7 43 21	- 11	z 11 0	---		
Paris	---	132.1	337	e 36 18	+ 379	---	---	---	z 14 0	---		

Coimbra		143-6	339	7 32 47	+ 125	—	—	—	8 15 0	—	—
Granada	C.	144-1	330	—	—	—	—	—	8 19 0	8 24 0	q
San Fernando	N.	M.	145-9	332	7 49 0	r	—	—	—	8 57 0	—
	E.	M.	145-9	332	8 20 30	s	—	—	—	9 4 0	—

NOTES.—*a*, L 2S. *b*, PS 7h. 27m. 12s. *c*, MN 7h. 39m. 34s.; ME 7h. 39m. 1s. *d*, MN 7h. 39m. 7s.;
 ME 7h. 35m. 51s. *e*, MN 7h. 40m. 58s.; ME 7h. 40m. 34s. *f*, e 7h. 55m. 17s. *g*, L 50m?
h, MN 8h. 2m. 30s.; ME 8h. 6m. 48s. *i*, i 7h. 37m. 37s.; 6° 48', 154° 8E. *j*, e, 7h. 32m. 27s.; c, 7h. 38m. 39s.;
e, 7h. 42m. 10s. *k*, i 7h. 38m. 53s.; PS 7h. 42m. 32s.; SR, 7h. 49m. 0s.; 5° 08', 152° 0E. *l*, L 8h. 9m. 36s.
 and 8h. 16m. 42s. *m*, cL 8h. 10m. 0s.; LN 8h. 12m. 0s., and 8h. 15m. 0s. *n*, PR? 7h. 34m. 21s.
o, O-C +2811s. *p*, O-C +888s. *q*, i 7h. 33m. 6s.; R 7h. 36m. 1s., and 7h. 40m. 16s.
r, O-C +1088s. *s*, O-C +2978s.

1916. September 15d. 7h. 1m. 5s.

Epicentre 34°5N. 138°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.		PR ₁		S.		O-C.		L.		M.		Notes Ref.
				H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.			
Osaka	O.	2-2	284	—	—	—	—	—	—	—	—	—	—	7 3 41	—	—	—	b
Mizusawa	N. O.	5-2	28	7 2 28	+ 3	—	—	—	7 3 27	— 0	—	—	—	—	—	—	—	
	E. O.	5-2	28	7 2 28	+ 3	—	—	—	7 3 25	- 2	—	—	—	—	—	—	—	
Zi-ka-wei	W.	14-3	262	7 d 58	+ 23	—	—	—	c 8 6	+ 46	—	—	—	—	—	—	f	
Manila	W.	24-9	222	e 6 47	+ 5	—	—	—	7 11 50	+ 44	—	—	7 15 55	—	—	—	g	
Irkutsk	G.	29-9	317	i 7 30	- 2	—	—	—	i 12 34	- 3	—	—	7 17 0	—	—	—	h	
Calcutta	N. O.E.	44-8	269	7 9 42	+ 5	—	—	—	7 19 24	+187	—	—	7 29 0	—	—	—		
	E. O.E.	44-8	269	7 9 42	+ 5	—	—	—	7 18 54	+157	—	—	7 27 54	—	—	—		
Batavia	W.	50-2	222	c 10 11	- 2	—	—	—	i 17 18	- 8	—	—	—	—	—	—		
Ekaterinburg	G.	55-1	319	j 10 52	+ 7	—	—	—	i 18 39	+ 12	—	—	7 21 30	—	—	—	i	
Honolulu	M.	57-1	85	7 11 0	+ 2	—	—	—	7 18 12	- 10	—	—	7 27 12	—	—	—		
Bombay	E. M.	59-4	274	7 11 32	+ 19	—	—	—	7 20 7	+ 46	—	—	—	—	—	—		
Kodaisanal	M.	60-1	261	7 12 0	- 42	—	—	—	—	—	—	—	7 20 0	—	—	—		
Colombo	M.	60-1	257	7 20 0	? S	—	—	—	7 20 0	+ 31	—	—	7 21 0	—	—	—		
Pulkovo	G.	68-8	330	i 12 20	+ 5	—	—	—	i 21 23	+ 6	—	—	7 31 0	—	—	—	j	
Ardelaide	E. M.	69-4	180	7 17 42	+ 304	—	—	—	—	—	—	—	—	—	—	—		
Tiflis	G.	70-1	308	7 12 33	+ 10	—	—	—	i 21 46	+ 14	—	—	c 34 0	—	—	—		
Victoria, B.C.	M.	70-1	44	7 10 12	- 131	—	—	—	7 19 6	-146	—	—	7 31 0	—	—	—		
Melbourne	M.	72-6	171	7 2 6	l	—	—	—	—	—	—	—	—	—	—	—		
Berkeley	N. —	76-2	53	e 12 52	- 9	—	—	—	e 22 43	- 1	—	—	—	—	—	—		
	E. —	76-2	53	e 12 55	- 6	—	—	—	e 22 19	- 25	—	—	—	—	—	—		
	V. —	76-2	53	e 12 48	- 13	—	—	—	e 22 40	+ 4	—	—	—	—	—	—		
Lick	W.	77-1	54	e 12 51	- 16	—	—	—	—	—	—	—	—	—	—	—		
Edinburgh	E. M.	83-8	339	7 11 0	+ 14	—	—	—	? 21 30	+ 19	—	—	—	—	—	—		
De Bilt	—	84-1	333	7 13 50	+ 3	—	—	—	i 24 2	- 12	—	—	c 46 0	—	—	7 51 29		
Eskdalemuir	G.	84-3	339	7 13 49	+ 0	—	—	—	7 17 22	— 19	—	—	7 11 0	—	—	—		
Stonyhurst	M.	85-3	338	e 22 30	? S	—	—	—	7 23 57	-117	—	—	—	—	—	—		
Helwan	N. M.	85-6	304	7 14 0	+ 4	—	—	—	c 22 30	—	—	—	—	—	—	—		
	E. M.	85-6	304	7 14 0	+ 4	—	—	—	—	—	—	—	—	—	—	—		
Bidston	M.	85-9	338	7 14 12	+ 14	—	—	—	7 24 12	- 22	—	—	—	—	—	—		
Kew	M.	86-6	335	7 24 30	? S	—	—	—	7 24 30	- 12	—	—	—	—	—	—		
Shide	M.S.	87-6	336	—	—	—	—	—	—	—	—	—	—	—	—	—		
	M.B.	87-6	336	—	—	—	—	—	7 24 43	- 10	—	—	—	—	—	—		
Paris	—	87-8	332	7 14 4	- 5	—	—	—	7 24 23	- 32	—	—	7 47 0	—	—	—		

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Monte Cassino N.	V.	88-4	322	7 11 27	+ 15	—	—	—	7 55 0	—
Rocca di Papa	Aga.	88-7	322	7 14 7	—	—	7 24 26	- 39	c 48 24	7 58 48
Mauritius	N.	M.	93-5	248	7 25 0	? S	7 25 0	- 56	—	—
	E.	M.	93-5	248	7 25 54	? S	7 25 54	- 2	—	—
Barcelona	Ma.	94-0	328	e 18 24	? PR ₁	—	i 24 58	- 63	7 49 32	7 55 30
Ottawa	B.	94-4	23	n 14 31	- 14	7 18 12	7 24 48	- 77	?	—
	B.	94-4	23	—	—	—	—	—	—	—
Toronto	M.	94-7	26	—	—	—	? 25 42	- 26	s	8 0 48
Coimbra	—	99-2	335	—	—	—	t 25 26	- 87	7 48 0	—
Granada	C.	99-9	350	7 16 18	+ 63	—	? 29 23	+ 143	7 50 0	8 0 18 u
Rio Tinto	M.	100-6	332	7 26 0	? S	—	? 26 0	- 66	—	7 33 0
San Fernando	N.	M.	101-6	331	7 23 30	+ 487	—	—	8 3 0	8 13 0
	E.	M.	101-6	331	7 23 0	+ 577	—	7 34 12	+ 416	8 5 0
La Paz	—	150-8	60	i 20 56	+ 116	—	7 35 0	+ 464	7 58 0	8 30 30
	—	—	—	—	—	—	7 36 1	- 176	8 11 0	8 30 30

NOTES.—*a*, MN 7h. 4m. 39s.; ME 7h. 4m. 48s. *b*, PS 7h. 2m. 31s. =P? *d*, 4m?
e, MN 7h. 11m. 51s.; ME 7h. 12m. 11s. *f*, iPE 7h. 4m. 58s. *g*, MN 7h. 21m. 6s.; ME 7h. 21m. 21s.
h, 33° 8' N, 136° 6' E. *i*, SR, 7h. 20m. 30s. *j*, SR, 7h. 26m. 30s. *k*, MN 7h. 35m. 54s. and 7h. 40m. 28s.
l, O—CJ—633s.; ? 10min. in error. *m*, M 7h. 24m. 30s. 3S. and 7h. 52m. 0s. *n*, M 7h. 47m. 5s. and 7h. 57m. 35s.
o, SR, 7h. 29m. 52s. *p*, PR 7h. 19m. 36s. *q*, M 7h. 54m.—55m., and 7h. 58m.—59m. *r*, eL 7h. 42m. 0s.;
L 7h. 50m. 0s. *s*, L 7h. 36m. 0s. and 7h. 48m. 18s. *t*, c 7h. 18m. 0s.; iSN? *u*, R 7h. 20m. 27s.;

1916. September 23d. 5h. 41m. 54s.

Epicentre 10° 0N. 97° 0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
Washington	N.	33.9	28	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
	E.	33.9	28	e 48 49	- 9	---	5 54 12	- 20	e 58 58	6 1 22	
Lick	W.	35.0	325	e 48 14	+ 14	---	i 54 10	- 22	e 58 30	6 4 58	
Berkeley	---	35.9	325	e 51 1	+ 114	---	---	---	---	6 14 18	
Toronto	M.	36.9	21	e 50 46	+ 91	---	b 0 25	+ 322	---	6 5 6	
La Paz	---	39.0	133	† 48 42	- 41	---	5 55 48	+ 31	---	6 5 3	
Ottawa	N.	39.8	24	i 49 38	- 2	---	5 55 0	- 46	5 58 20	6 5 50	e
	E.	39.8	24	---	---	---	5 55 39	- 19	c 1 0	---	
Victoria, B.C.	B.	39.8	24	5 49 50	+ 3	---	5 55 43	- 15	c 8 0	---	
Honolulu	M.	44.3	335	5 56 42	+ 5	---	5 56 42	- 18	6 8 18	6 19 30	s
Coimbra	N.	59.5	289	5 54 30	+ 147	---	6 3 30	+ 199	6 14 0	6 18 42	
	E.	82.5	50	e 55 28	+ 1	---	---	---	6 17 52	6 24 24	
Eskdalemuir	G.	82.5	50	e 54 36	+ 9	---	6 4 28	- 18	6 6 36	6 23 28	
Edinburgh	M.	83.9	34	e 54 17	+ 12	---	6 4 57	- 4	6 18 0	---	
Rio Tinto	M.	83.9	34	5 55 0	+ 25	---	---	---	---	6 26 30	
Stonyhurst	M.	81.2	53	5 56 0	+ 83	---	---	---	---	6 36 0	
San Fernando	N.	84.6	36	e 48 48	g	---	e 5 24	+ 15	---	6 25 48	
	E.	84.7	54	6 3 30	† 55	---	6 3 30	+ 100	6 22 0	6 28 0	
Bidston	M.S.	84.7	54	6 3 30	† 55	---	6 5 30	+ 20	6 20 30	6 31 30	
Shide	N.	85.9	39	6 5 54	† 55	---	6 5 34	+ 44	---	6 28 18	
	E.	85.9	39	5 54 52	+ 5	---	6 5 38	+ 39	---	6 24 30	
Kew	M.B.	86.3	38	---	---	---	6 5 43	+ 34	---	6 24 30	
Granada	C.	88.6	53	6 18 0	h	---	---	---	---	6 28 30	
De Bilt	---	89.5	36	5 55 i	j	---	6 6 23	+ 52	6 11 0	6 22 42	
Barcelona	Ma.	90.2	48	5 55 23	+ 16	---	6 5 54	- 8	e 22 0	6 28 45	
Paris	---	92.4	41	---	---	---	e 5 50	- 20	e 19 8	6 27 20	
Rocca di Papa	Agg.	97.6	45	5 55 13	- 10	---	6 6 16	- 17	6 17 0	6 28-29	
Pulkovo	G.	98.7	24	---	---	---	---	---	---	6 47 18	k
Irkutsk	G.	115.1	346	1 56 15	+ 17	---	---	---	---	---	l
Helwan N. and E.	M.	116.3	49	e 2 44	+ 329	---	e 12 40	+ 155	m	z 1 37	
Tiflis	G.	117.6	31	6 12 0	† 5	---	6 12 0	+ 106	---	---	
Melbourne	M.	118.3	234	† 1 52	+ 266	---	† 12 38	- 133	6 37 30	6 41 46	n
				e 48 0	o	---	---	---	6 50 42	6 54 24	

Bombay	E.	M.	149-4	19	7	2	14	<i>p</i>	—	—	—	—	7	12	38
Mauritius	N.	M.	153-8	115	6	24	0	<i>q</i>	—	—	—	—	7	5	30
	E.	M.	153-8	115	6	54	59	<i>r</i>	—	—	—	—	7	5	30

NOTES.—*a*, N and E, cP?. *b*, cSN? *c*, MN 6h. 0m. 25s.; ME 6h. 11m. 53s. *d*, L 5h. 58m. 36s. and 6h. 1m. 0s.
e, PR₂ 5h. 51m. 17s. *f*, ME 6h. 23m. 33s. and 6h. 29m. 43s. *g*, O-C -352s. *h*, O-C +1391s.
i, cP 5h. 55m. 42s. and 1P 5h. 55m. 51s. *j*, O-C +51s. and +60s. *k*, c 6h. 28m. 48s. *l*, c 5h. 59m. 50s.
m, cL 6h. 35m. 0s. and L 6h. 13m. 0s. *n*, cP? and cS?. *o*, O-C +3031s. *p*, O-C +3751s.
q, O-C +1140s. *r*, O-C +3209s. *s*, S given as 6h. 2m. 2s.

1916. September 27d. 15h. 2m. 9s.

Epicentre 38°5N. 22°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁	S.		O-C.	L.	M.		Notes Ref.
				h. m. s.	s.	h. m. s.	h. m. s.	s.	h. m. s.	h. m. s.	s.			
Monte Cassino E.	V.	7.2	295	15 4 16	+ 18	—	—	—	—	—	15 9 52	—	—	
Rocca di Papa	Aga.	8.1	296	e 4 11	+ 1	—	—	—	—	—	—	15 7 0	0	a
Helwan	N. M.	11.3	137	15 6 0	+ 62	—	—	—	—	—	—	15 15 24	—	
	E. M.	11.3	137	—	—	—	—	—	—	—	—	15 16 18	—	
Moncalieri	S.	12.8	305	? 5 12	+ 7	—	—	? 8 28	+ 40	15 10 10	—	—	—	
Barcelona	Ma.	15.8	286	e 6 6	+ 8	—	—	15 9 7	+ 8	15 10 58	15 13 0	—	—	
Tiflis	G.	17.3	72	e 6 18	0	—	—	—	—	—	—	—	—	
	G.	17.3	72	i 6 19	+ 1	—	—	15 9 42	+ 8	15 11 54	—	E 13 55	—	
Paris	—	17.6	312	15 6 27	+ 6	—	—	15 9 47	+ 7	15 12 3	—	15 12 0	—	
De Bilt	—	18.2	325	15 6 34	+ 6	—	—	15 9 58	+ 5	—	—	15 15 7	—	
Granada	C.	20.5	271	i 7 6	+ 10	—	—	15 10 51	+ 8	15 12 54	—	15 17 36	—	
Kew	M.	20.5	316	15 11 0	? 8	—	—	? 11 0	+ 17	—	—	15 17 0	—	
Pulkovo	G.	21.8	11	i 7 6	— 6	—	—	i 10 58	— 12	15 13 0	—	15 16 15	—	
San Fernando	N. M.	22.7	271	15 7 0	— 22	—	—	—	—	15 15 30	—	15 20 0	—	
	E. M.	22.7	271	—	—	—	—	15 11 0	— 28	15 16 0	—	15 17 0	—	
Stonyhurst	M.	22.8	320	—	—	—	—	i 9 24	— 126	—	—	15 15 12	—	
Bidston	M.	23.0	319	15 6 18	— 68	—	—	15 12 6	+ 32	—	—	15 17 48	—	
Coimbra	N.	23.8	286	e 4 38	— 177	—	—	—	—	15 16 50	—	15 18 38	—	
	E.	23.8	286	e 6 26	— 69	—	—	15 12 6	+ 17	15 17 30	—	—	—	
Eskdalemuir	G.	24.0	323	15 7 31	— 6	—	—	15 11 47	— 6	15 14 55	—	—	—	
Edinburgh	E. M.	24.3	324	15 9 0	+ 80	—	—	—	—	—	—	15 17 0	—	
Irkutsk	G.	55.0	47	e 11 55	+ 1	—	—	e 19 43	+ 1	15 32 0	—	15 38 16	—	

Notes.—a, cL 15h. 10m. 42s.; M, also 15h. 7m. 42s. ME 15h. 17m. 0s. b, MN 15h. 11m. 38s.; ME 15h. 13m. 23s. c, MN 15h. 16m. 27s.;

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	Pr ₁	S.	O-C.	L.	M.	Notes Ref.
		°	c	H. M. S.	s.	H. M. S.	H. M. S.	s.	H. M. S.	H. M. S.	
La Paz	---	10.5	126	18 57 40	+ 17	---	18 59 53	+ 25	19 1 28	N 1 36	
Toronto	M.	54.2	358	---	---	---	---	---	19 21 24	---	
Ottawa	B.	55.9	1	19 4 28	- 3	---	19 12 18	- 1	a	---	
Victoria, B.C.	M.	71.6	330	19 29 0	b	---	19 32 6	c	19 34 0	19 37 0	
Coimbra	---	81.0	45	19 7 11	0	---	19 17 23	+ 2	d	---	
San Fernando	N. E.	M. 81.2 M. 81.2	50 50	---	---	---	19 17 30 19 17 0	+ 7 - 23	19 37 30 19 38 0	19 46 0 19 49 0	
Rio Tinto	M.	81.4	49	19 18 0	? S	---	19 18 0	+ 35	---	19 49 0	
Granada	C.	83.4	50	i 7 21	- 3	---	i 17 53	+ 6	19 35 0	E 40 30	
Honolulu	M.	85.5	293	19 18 30	? S	---	19 18 30	+ 19	19 34 6	19 40 30	
Barcelona	Ma.	88.9	48	c 8 20	+ 24	---	19 18 34	- 14	c 34 10	19 45 0	
Bidston	N.	M.S. 89.0 M.S. 89.3	35 38	19 7 36	- 22	---	19 18 18 19 18 36	- 31 - 26	---	19 37 36 19 42 30	
Slide	M.L.B.	89.3	38	---	---	---	19 18 36	- 26	---	19 42 30	
Stonyhurst	M.	89.5	35	---	---	---	i 17 30	- 85	---	19 45 48	
Eskdalemuir	G.	89.6	33	19 7 49	- 11	---	19 18 20	- 36	19 33 0	e	
Edinburgh	E.	M. 89.8 M. 90.1	33 37	19 18 30	? S	---	? 18 30	- 28	---	19 48 0 19 49 0	
Kew	---	91.1	40	f	+ 252	---	c 18 22	- 49	19 38 0	19 50 0	
Paris	---	93.5	38	---	---	---	e 19 0	- 36	e 40 0	19 45 44	
De Bilt	S.	93.7	45	c 18 52	? S	---	? 18 52	- 47	19 36 12	g	
Moncalieri	Aga.	96.8	49	---	---	---	e 20 6	h	---	---	
Rocca di Papa	G.	107.8	50	---	---	---	---	---	19 41 0	19 55 29 i	
Pulkovo	N.	M. 111.0 M. 111.0	62 62	19 30 0 19 26 0	j k	---	---	---	---	---	
Helwau	E.	M. 111.0	62	19 26 0	---	---	---	---	---	---	
Melbourne	M.	117.8	217	---	---	---	---	---	19 54 24	19 59 18	
Tiflis	G.	120.5	48	---	---	---	---	---	19 59 18	---	l
Mauritius	E.	M. 126.1	125	20 0 0	m	---	---	---	---	20 6 48	
Irkutsk	G.	138.2	0	---	---	---	---	---	20 25 0	---	n
Bombay	E.	M. 149.7	71	20 21-24	o	---	---	---	---	---	
Kodaikanal	M.	154.9	87	20 24 6	o	---	---	---	---	---	

NOTES.—a, L 19h. 21m. 6s.; 19h. 31m. 0s., and 19h. 34m. 0s. b, O-C +1367s. c, O-C +995s.
d, LN 19h. 35m. 55s.; LE 19h. 35m. 43s. e, MN 19h. 36m. 0s.; ME 19h. 42m. 0s. f, e 19h. 12m. ? 0s.
g, MN 19h. 51m. 2s.; ME 19h. 50m. 42s. h, O-C +536s. i, e₁ 19h. 13m. 54s.; e₂ 19h. 20m. 6s.; e₃ 19h. 23m. 6s.;
e₄ 19h. 29m. 12s. j, O-C +972s. k, O-C +1212s. l, e₁ 19h. 15m. 12s.; e₂ 19h. 30m. 54s.
m, O-C +2944s. n, e₁ 19h. 14m. 12s.; e₂ 19h. 17m. 18s. o, O-C +4270s.

1916. October 3d. 1h. 26m. 13s.

Epicentre 14°08. 74°5W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
				H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
La Paz	—	c 6.6	112	i 27 53	0	—	i 29 11	- 2	—	—	
Washington	N. —	53.0	357	e 35 39	0	—	1 43 24	+ 15	a	—	
	E. —	53.0	357	e 35 39	0	—	1 43 13	+ 4	—	—	
Toronto	M. —	57.8	356	i 36 48	+ 37	—	1 45 6	+ 57	b	2 3 18	
Ottawa	N. B.	59.4	359	e 36 26	+ 5	—	i 44 42	+ 13	—	—	
	E. B.	59.4	359	i 36 32	+ 11	—	e 44 36	+ 7	c	—	
Berkeley	E. —	68.4	321	e 37 32	+ 12	—	e 46 42	+ 22	—	2 7 0	
Victoria, B.C.	M. —	75.9	329	i 38 30	+ 23	—	1 49 0	+ 71	1 58 30	2 13 30	
Accra	N. —	76.2	81	i 37 30	— 39	—	—	—	—	2 12 0	
Coimbra	N. W.	81.7	44	i 38 41	— 1	—	1 49 7	+ 11	d	c	
San Fernando	N. M.	81.7	49	i 38 54	+ 12	—	1 49 0	+ 4	2 11 30	2 23 0	
	E. M.	81.7	49	i 40 0	+ 78	—	1 50 0	+ 60	2 11 30	2 18 30	
Rio Tinto	M. —	81.9	48	i 40 0	+ 77	—	—	—	—	2 18 0	
Cape Town	E. M.	84.6	124	i 40 6	+ 67	—	1 50 6	+ 38	2 6 36	2 16 48	
Honolulu	M. —	89.2	292	i 40 0	+ 36	—	1 51 0	+ 42	2 8 0	2 13 48	
Barcelona	Ma.	89.5	47	e 39 24	— 2	—	e 50 6	— 16	1 56 47	2 18 0	
Sbide	M.S.	90.6	37	i 39 30	— 2	—	1 50 7	— 26	2 10 55	2 17 30	
Bidston	N. M.S.	90.6	36	i 39 36	+ 4	—	1 50 30	— 3	—	2 17 30	
Stonyhurst	M. —	91.1	34	i 39 30	+ 5	—	1 50 24	— 14	2 16 18	2 18 6	
Eskdalemuir	G. —	91.2	33	i 39 32	+ 2	1 43 16	1 56 16	+ 337	—	2 6 25	
Kew	M. —	91.4	37	i 48 30	? S.	—	? 48 30	- 131	—	2 22 12	
Edinburgh	E. M.	91.5	32	i 39 30	— 7	—	—	—	—	2 25 18	
Paris	—	92.2	40	i 39 34	— 7	—	1 50 12	— 38	f	g	
Moncalieri	S. —	94.5	45	i 39 50	— 4	—	1 50 36	— 38	2 1 25	h	
De Bilt	—	94.8	37	i 39 48	— 7	1 43 48	N 50 59	— 18	e 5 0	2 19 47	
Rocca di Papa	Aga.	97.2	49	i 39 50	— 18	—	? 50 26	— 75	c 16 20	2 25 0	
Pulkovo	G. —	109.5	31	i 40 51	— 17	1 45 16	1 53 10	— 27	2 12 0	—	j
Helwan	E. M.	110.5	63	i 52 12	? S.	—	1 52 12	— 94	—	—	
Sydney	E. M.	115.2	221	? 51 36	? S.	—	1 51 36	- 169	k	l	
Melbourne	M. —	116.3	214	e 45 54	+ 255	—	—	—	1 55 6	1 57 42	
Tiflis	G. —	121.0	50	c ₁ 41 41	+ 19	—	—	—	e 32 0	2 36 5	m
Adelaide	E. M.	121.8	212	i 54 54	? S.	—	1 54 54	— 22	—	2 34 42	
Mauritius	N. M.	122.1	125	i 45 48	+ 222	—	—	—	1 56 12	2 27 24	
	E. M.	122.1	125	i 46 0	+ 234	—	—	—	1 56 24	2 34 48	

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Ekatorinburg	G.	125.4	28	1 46 42	+ 261	---	---	---	2 3 0	---	n
Mizusawa	N.	139.9	315	1 46 6	+ 122	---	---	---	---	---	---
	E.	139.9	315	1 45 59	+ 115	---	---	---	---	---	---
Tekutsk	G.	141.7	0	---	---	---	---	---	2 28 0	---	z 2 52 o
Osaka	O.	146.0	313	1 46 2	+ 134	2 6 43	---	---	2 28 26	---	p
Bombay	E.	148.3	77	1 46 28	+ 151	---	---	---	---	---	2 56 40
Kodaikanal	M.	152.3	96	1 49 54	+ 341	---	---	---	---	---	2 12 12
	M.	152.3	96	---	---	---	---	---	1 59 36	---	2 54 18
Colombo	E.	M.	153.8	103	1 51 0	+ 401	---	---	2 48 36	---	---
Batavia	W.	159.8	184	e 46 51	---	---	---	?	54 14	-274	1 54 30 q
Manila	W.	165.0	272	c 46 47	---	---	---	2 7 19	r	---	s
									2 29 6		

NOTES.—*a*, cLE 1h. 51m. 41s. to 2h. 2m. 2s. *b*, L 1h. 52m. 5s. and 1h. 56m. 7s. *c*, eL 1h. 54m. 36s. to 2h. 32m. 0s.
d, LN 2h. 4m. 11s.; LE 2h. 9m. 43s. *e*, MN 2h. 13m. 25s.; ME 2h. 13m. 5s. *f*, L 2h. 6m. 0s. to 2h. 14m. 0s.
g, MN 2h. 20m.—21m.; ME 2h. 23m.—24m. *h*, M 2h. 22m. 40s. and 2h. 23m. 10s. *i*, MN 2h. 12m. 33s. and
2h. 15m. 39s. *j*, I 1h. 51m. 28s.; PS 1h. 54m. 55s.; SR, 2h. 0m. 59s. *k*, L 1h. 55m. 42s. and 2h. 2m. 30s.
l, M 1h. 57m. 0s. and 2h. 3m. 0s. *m*, e₁ 1h. 46m. 41s.; e₂ 1h. 48m. 53s. *n*, e 1h. 46m. 42s. = P.
o, c₁ 1h. 45m. 40s.; e₂ 1h. 49m. 13s.; e₃ 2h. 7m. 40s.; e₄ 2h. 13m. 14s. *p*, MN 2h. 39m. 11s.; ME 2h. 38m. 9s.
q, eL? 2h. 10m. 0s.; ML 2h. 52m. 0s. *r*, O—C +493s. *s*, MN 2h. 49m. 35s.; ME 2h. 45m. 52s.

1916. October 3d. 13h. 31m. 18s.

Epicentre 55°0N. 160°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Victoria, B.C.	M.	23.4	90	13 40 12	? S	—	? 40 42	- 9	13 43 48	13 44 54	
Toronto	M.	50.7	67	—	—	—	—	—	14 1 48	—	
Irkutsk	G.	52.2	310	e 40 31	- 5	—	e 48 10	+ 6	14 1 0	—	
Zi-ka-wei	W.	58.6	281	e 40 32	- 49	—	—	—	—	—	
Ekatereburg	G.	63.4	336	i 42 3	+ 11	—	c 50 30	+ 6	14 2 0	14 13 51	
Pulkovo	G.	65.0	354	i 42 1	- 2	—	13 50 37	- 6	14 0 0	N 9 14	
Eskdalemuir	G.	68.1	14	e 42 22	- 1	—	? 51 14	- 7	14 5 0	—	
Bidston	N. M.S.	69.9	14	14 4 12	a	—	14 9 24	b	—	14 14 0	
De Bilt	—	72.2	9	—	—	—	c 52 24	+ 14	e 9 0	14 9 50	
Tiflis	G.	81.0	341	13 43 38	- 5	—	c 53 55	+ 2	14 12 0	E 22 45	
Rocca di Papa	Aga.	83.0	6	13 43 42	- 12	—	—	—	—	—	
Rio Tinto	M.	84.5	21	14 22 0	c	—	—	—	—	14 27 0	
San Fernando	N. M.	85.8	21	13 55 0	? S	—	13 55 0	+ 14	14 18 30	14 25 0	
	E. M.	85.8	21	—	—	—	—	—	14 20 0	14 24 30	

NOTES.—*a*, O-C +1298s. *b*, O-C +1061s. *c*, O-C +2277s.

1916. October 11d. 18h. 5m. 23s.

Epicentre 14°0S. 174°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.		PR ₁		S.		O-C.		L.		M.		Notes Ref.
				h. m. s.	s.	h. m. s.	s.	h. m. s.	s.	h. m. s.	s.	h. m. s.	s.	h. m. s.	s.			
Sydney	E.	M.	37.2	232	18 12 30	- 25	---	---	18 17 24	- 86	18 20 48	18 22 0						
Honolulu		M.	38.7	24	---	---	---	---	---	---	18 19 30	18 24 0						
Melbourne		M.	43.4	229	---	---	---	18 19 12	18 20 30	+ 13	18 21 48	18 30 6						a
Adelaide	E.	M.	47.4	235	18 4 b	+ c	---	---	---	---	18 20 36	18 30 6						
Mizusawa	N.	O.	67.6	324	18 16 36	+ 11	---	---	18 25 32	+ 12	---	---						
	E.	O.	67.6	324	18 16 39	+ 14	---	---	18 25 36	+ 16	---	---						
Osaka		O.	68.3	317	18 16 37	+ 8	---	---	18 25 42	+ 13	18 31 57	---						d
Manila		W.	70.4	291	e 16 56	+ 14	---	---	---	---	---	---						
Berkeley		---	70.9	41	e 22 58	e	---	---	---	---	---	---	18 26 19					
Zi-ka-wei		W.	76.6	307	e 17 22	0	---	---	---	---	---	---	18 28 42					
Victoria, B.C.		M.	76.9	32	---	---	---	---	---	---	---	---	18 27 36	18 28 6				
		M.	76.9	32	---	---	---	---	---	---	---	---	18 46 54	18 56 24				
Batavia		W.	78.0	267	i 17 29	- 1	---	---	i 27 12	- 11	---	---	18 29 0	18 29 0				f
Irkutsk		G.	96.1	322	e 18 38	- 35	18 22 55	---	18 29 27	- 73	18 50 0	---	18 56 20	---				
La Paz		---	100.7	110	i 23 23	+ 226	---	---	i 29 48	- 97	18 52 0	---	19 5 48	---				
Toronto		M.	102.9	47	---	---	---	---	---	---	---	---	---	---				
Ottawa		B.	105.7	46	---	---	---	---	i 31 38	- 34	---	---	---	---				
Bombay	E.	M.	116.1	284	18 35 0	j	---	---	---	---	---	---	---	---				
Mauritius	N.	M.	118.6	237	18 31 36	k	---	---	---	---	---	---	---	---				
	E.	M.	118.6	237	18 30 54	l	---	---	---	---	---	---	19 14 18	---				
Capetown	E.	M.	130.6	194	18 43 30	m	---	---	---	---	---	---	18 46 30	---				
Pulkovo		G.	130.9	344	---	---	---	---	---	---	---	---	19 1 0	---				
Edinburgh	E.	M.	137.5	7	18 30 18	o	---	---	---	---	---	---	---	---				
Bidston	N.	M.S.	139.9	8	18 28 12	p	---	---	18 36 6	- 20	---	---	18 47 0	19 28 30				
De Bilt		---	141.9	1	---	---	---	---	---	---	---	---	e 21 0	19 26 9				
Kew		M.	142.2	6	---	---	---	---	---	---	---	---	---	18 48 0				
Shide		M.S.	142.8	8	---	---	---	---	---	---	---	---	18 46 45	---				
		M.D.	142.8	8	---	---	---	---	---	---	---	---	18 46 45	---				
Paris		---	145.1	356	18 25 10	+ 136	---	---	18 47 q	r	---	---	---	---				
Moncalieri		S.	149.0	358	e 25 30	+ 140	---	---	18 33 23	-232	18 43 33	---	---	---				
Coimbra	N.	W.	150.9	23	---	---	---	---	? 32 13	-311	18 48 31	---	---	---				
	E.	W.	150.9	23	e 25 25	+ 126	---	---	? 35 17	-127	18 48 25	---	---	---				
Rocca di Papa		Agn.	151.6	349	e 25 18	+ 117	---	---	---	---	---	---	e 44 54	---				
Helwan		M.	151.7	309	18 25 0	+ 99	---	---	---	---	---	---	---	---				

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Barcelona	Ma.	152-4	6									18 51 0	<i>t</i>
Rio Tinto	M.	153-8	23	e 25 42	+ 91								<i>u</i>
San Fernando N.	M.	155-0	24					18 36 0	- 96			18 49 30	
E.	M.	155-0	24									18 50 0	

NOTES.—*a*, SR 18h. 23m. 24s. *b*, P 54s.? (before epicentre). *c*, O-C --560s. *d*, MN 18h. 41m. 2s.; ME 18h. 38m. 47s.
e, O-C +373s. *f*, PS 18h. 30m. 20s. *g*, L 18h. 24m. 36s. and 18h. 28m. 0s. *h*, L 18h. 39m. 30s.;
18h. 44m. 0s., and 19h. 7m. 0s. *i*, e 18h. 31m. 23s. *j*, O-C +852s. *k*, O-C +637s.
l, O-C +595s. *m*, O-C +1297s. *n*, MN 19h. 0m. 51s. and MZ 19h. 14m. 32s. *o*, O-C +474s.
p, O-C +338s. *q*, S 28s.? *r*, O-C +632s. *s*, MN 18h. 26m. 36s.; ME 18h. 25m. 42s.
t, e 18h. 25m. 42s. = P. *u*, M 18h. 50m. 0s. and 19h. 42m. 0s. *v*, Probably two shocks overlapping.

1916. October 14d. 19h. 47m. 15s.

Epicentre 30°5N. 82°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁			S.	O-C.	L.			M.	Notes Ref.					
				H.	M.	S.	S.	H.	M.	S.	H.	M.	S.	H.	M.	S.						
Calcutta	N.	O.E.	9.8	143	19	49	42	—	—	—	19	51	24	—	15	19	52	30	—			
	E.	O.E.	9.8	143	19	49	36	—	—	—	19	51	24	—	15	19	52	30	—			
Kodaikanal		M.	20.8	193	—	—	—	—	—	—	—	—	—	—	—	19	57	36	19	58	18	
Colombo	E.	M.	23.7	186	19	56	30	?	8	—	19	56	30	—	23	19	59	30	20	0	12	
Irkutsk		G.	27.2	31	19	53	31	+	16	—	c	58	6	—	+	6	20	3	0	N	4	40
Zi-ka-wei		W.	33.7	73	19	54	17	—	0	—	19	59	49	—	—	—	—	—	—	?	8	16
Helwan	E.	M.	43.4	282	20	7	0	—	a	—	—	—	—	—	—	—	—	—	—	—	—	—
Pulkovo		G.	45.0	326	1	55	40	—	8	—	20	2	13	—	—	20	9	0	20	12	45	b
Rocca di Papa		Agg.	55.5	302	19	56	54	—	4	—	—	—	—	—	—	—	—	—	19	57	54	—
Moncalieri	S.	S.	58.8	307	—	—	—	—	—	—	—	—	—	—	—	c	22	6	—	—	—	—

NOTES.—a, O-C +684s. b, SR, 20h. 5m. 24s.

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1916. October 20d. 17h. 4m. 45s.

Epicentre 18°0S. 173°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁			S.	O. C.	L.			M.	Notes Ref.				
				H.	M.	S.	S.	H.	M.	S.	H.	M.	S.	H.	M.	S.					
Sydney	E.	M.	35.7	236	17	12	6	+ 2	---	---	17	18	0	+ 10	17	21	30	17	25	0	
Melbourne	---	M.	41.6	233	i	13	6	+ 15	---	---	17	19	42	+ 28	17	27	30	17	30	6	a
Honolulu	---	M.	42.0	21	---	---	---	---	---	---	---	---	---	---	17	21	12	17	22	0	
Adelaide	---	M.	46.1	238	?	12	36	---	---	---	---	---	---	---	---	---	---	17	39	12	
Mizusawa	N.	O.	71.5	324	17	16	10	---	---	---	17	25	26	---	---	---	---	---	---	---	
Osaka	E.	O.	71.5	324	17	16	7	---	---	---	17	25	36	+ 7	---	---	---	---	---	---	
Manila	---	O.	71.9	317	17	16	37	+ 23	---	---	17	25	37	+ 3	17	33	42	---	---	---	b
Manila	---	W.	72.8	292	e	16	24	+ 11	---	---	---	---	---	---	17	16	51	N	17	12	
Lick	---	W.	73.3	41	e	16	18	---	---	---	e	25	29	---	---	---	---	---	---	---	
Berkeley	---	---	73.4	40	e	16	10	---	---	---	e	25	33	---	---	---	---	---	---	---	
Batavia	---	W.	78.8	274	i	17	1	+ 4	---	---	---	---	---	---	c	36	30	17	53	0	
Victoria, B.C.	---	M.	79.8	31	17	27	18	?	S	---	17	27	18	+ 12	17	37	48	17	46	48	c
Zi-ka-wei	---	W.	79.9	308	17	16	41	---	---	---	---	---	---	---	---	---	---	---	---	---	
La Paz	---	---	98.4	69	17	18	35	---	---	---	17	30	8	+ 3	17	46	0	17	54	24	
Irkutsk	---	G.	99.8	218	e	18	31	---	---	---	e	30	26	---	---	---	---	---	---	---	
Toronto	---	M.	104.8	18	---	---	---	---	---	---	---	---	---	---	?	33	18	17	34	48	
Washington	E.	---	105.7	51	---	---	---	---	---	---	---	---	---	---	17	58	12	18	2	18	
Ottawa	E.	---	107.7	47	e	16	17	- 172	---	---	---	---	---	---	17	46	30	---	---	---	
Colombo	E.	M.	108.4	270	17	24	0	+ 266	---	---	---	---	---	---	---	---	---	---	---	---	
Kodaikanal	---	M.	111.6	274	17	24	54	+ 306	---	---	---	---	---	---	---	---	---	---	---	---	
Mauritius	E.	M.	117.2	235	17	25	6	+ 291	---	---	---	---	---	---	18	3	6	18	8	42	
Bombay	E.	M.	118.0	283	17	35	24	? S	---	---	17	35	24	+ 125	---	---	---	18	14	44	
Pulkovo	---	G.	135.0	196	i	24	9	+ 155	17	26	32	d	36	21	+ 63	---	---	---	---	---	
Edinburgh	---	M.	141.4	171	17	32	12	e	---	---	---	---	---	---	---	---	---	---	---	---	
Edinburgh	---	G.	141.8	171	17	27	12	+ 309	---	---	---	---	---	---	---	---	---	---	---	---	
Stonyhurst	---	M.	143.5	171	e	27	54	+ 344	---	---	e	45	42	f	c	20	30	18	22	54	
Bidston	---	M.S.	143.8	170	17	27	48	+ 337	---	---	17	38	18	+ 128	---	---	---	---	---	---	
De Bilt	---	---	145.9	178	e	24	29	+ 129	---	---	---	---	---	---	c	14	0	18	27	5	
Kew	N.	M.	146.0	172	17	33	0	? S	---	---	? 33	0	- 202	---	---	---	---	---	---	---	
Paris	---	---	149.0	174	i	24	35	+ 123	17	27	59	---	---	---	e	18	0	18	35	0	
Moncalieri	---	S.	153.1	181	i	25	5	+ 136	---	---	17	37	54	+ 57	17	48	20	N	33	10	
Coimbra	---	W.	154.3	152	17	24	42	+ 106	---	---	---	---	---	---	N	38	22	N	33	0	
Coimbra	---	W.	154.3	152	---	---	---	---	---	---	E	37	37	+ 34	E	20	42	E	28	52	
Helwan	E.	M.	164.7	237	17	25	6	+ 131	---	---	---	---	---	---	---	---	---	19	6	12	

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Rocca di Papa	Aga.	155-7	190	e 24 44	+ 105	---	---	---	---	17 25 30
Barcelona	Mb.	156-2	171	---	---	---	---	---	e 24 14	---
Rio Pinto	M.	156-3	152	17 25 0	+ 116	---	---	---	---	18 14 0
San Fernando	N.	158-0	151	17 25 42	+ 177	---	---	---	---	18 31 0
	E.	158-0	151	17 25 30	+ 165	---	17 40 0	+188	18 28 18	18 34 0
							17 47 30	<i>g</i>	18 28 42	18 34 0

NOTES.—*a*, SR, 17h. 23m. 42s. *b*, MN 17h. 38m. 56s.; ME 17h. 39m. 11s. *c*, S given as 17h. 31m. 18s.
d, PS=S. *e*, O-C +610s. *f*, O-C +574s. *g*, O-C +638s.

1916. October 21d. 19h. 25m. 23s.

Epicentre 11°0N. 94°5E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Calcutta	N. O.E.	12.9	333	19 28 36	+ 1	---	19 31 54	+ 46	19 34 36	19 40 36	
Colombo	E. M.	15.1	255	19 28 0	- 63	---	19 32 12	+ 15	19 31 36	19 31 36	
Kodaikanal	M.	16.8	265	19 30 0	+ 35	---	---	---	19 34 36	19 36 54	
Batavia	W.	21.1	144	? 30 6	- 11	---	19 30 6	? P	---	N 41 31	c
Bombay	M.	22.4	293	19 30 41	+ 8	---	---	---	---	19 38 39	
Manila	W.	26.0	80	c 31 25	+ 14	---	19 35 55	+ 10	19 40 23	N 43 35	
Zi-ka-wei	W.	32.1	47	19 31 56	- 15	---	19 37 16	- 17	---	---	
Irkutsk	G.	42.0	9	c ₂ 33 24	- 10	---	z 37 25	- 8	z 43 30	e 50 57	f
Mauritius	N. M.	47.6	229	19 44 12	g	---	e ₁ 39 56	- 2	19 50 0	---	
Mizusawa	N. M.	47.6	229	19 43 30	h	---	---	---	---	19 48 36	
Mizusawa	E. O.	50.0	57	19 34 23	- 7	---	19 41 46	+ 4	i 41 46	---	
Ekaterinburg	G.	50.0	57	19 34 29	- 1	---	19 41 41	- 1	i 41 41	---	
Helwan	M.	61.3	337	19 34 55	+ 9	---	19 42 15	+ 2	19 49 30	19 59 7	
Pulkovo	G.	67.7	331	19 36 26	+ j 1	k	---	---	---	---	
Melbourne	M.	67.9	139	e 44 48	? S	---	i 45 19	- 2	20 0 0	l 8 18	m
Moncalieri	S.	80.0	311	---	---	---	e 44 48	- 36	19 57 49	20 16 0	
De Bilt	---	81.0	322	---	---	---	e 47 26	- 20	e 12 0	20 16 50	
Kew	M.	84.3	321	---	---	---	e 47 42	- 16	---	20 19 30	
Shide	M.S.	85.1	321	---	---	---	---	---	20 15 0	---	
Edinburgh	E. M.	85.2	326	19 48 30	? S	---	19 48 30	- 14	---	20 29 0	
Stonvhurst	M.	85.2	324	e 47 36	? S	---	19 47 36	- 68	---	20 23 30	
Bskdalemuir	G.	85.3	325	? 48 34	? S	---	19 48 34	- 11	20 16 0	---	
Bilston	N. M.S.	85.7	324	19 48 24	? S	---	19 48 24	- 26	---	20 21 36	
San Fernando	N. M.	91.9	308	19 48 30	? S	---	19 48 30	- 87	---	---	
Honolulu	M.	101.9	65	---	---	---	---	---	20 16 12	---	
Ottawa	B.	122.9	352	---	---	---	---	---	x 35-45	---	
Toronto	M.	125.1	355	---	---	---	---	---	20 42 36	---	
La Paz	---	162.3	250	19 45 19	+ 80	---	---	---	20 56 0	21 1 45	

NOTES.—*a*, M 19h. 35m. 12s. and 19h. 39m. 30s. *b*, P 0s? *c*, cP 19h. 26m. 8s. *d*, MN 19h. 47m. 17s.; ME 19h. 46m. 44s. *e*, SRZ₁ 19h. 38m. 44s.; SRZ₂ 19h. 40m. 12s. *f*, e₁ 19h. 29m. 6s.; e₂ 19h. 35m. 27s. *g*, O-C +598s. *h*, O-C +556s. *i*, ?S 19h. 41m. 46s. and 19h. 41m. 41s. *j*, O-C +916s. *k*, PR₂ 19h. 40m. 48s. *l*, MN 20h. 7m. 1s. and ME 20h. 8m. 12s. *m*, SR₁ 19h. 50m. 0s.

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1916. October 31d. 15h. 30m. 33s.

Epicentre 46°·5N. 160°·0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁			S.			O-C.	L.			M.			Notes Ref.		
				H.	M.	S.	S.	H.	M.	S.	H.	M.	S.	H.	M.	S.	H.	M.	S.				
Mizusawa	N.	O.	15-6	249	15	34	15	+	25	—	—	15	38	5	+	47	15	38	5	—	—		
	E.	O.	15-6	249	15	34	15	+	25	—	—	15	38	2	+	44	15	38	2	—	—		
Osaka		O.	21-9	247	a	35	59	+	22	—	—	—	—	—	—	—	15	40	16	E. 43	41	a	
Zi-ka-wei		W.	33-2	257	e	37	21	—	10	—	—	e	42	47	—	13	e	46	3	N. 51	11	b	
Honolulu		W.	42-3	112	15	39	18	+	32	—	—	15	46	12	+	60	15	53	36	16	0	0	
Manila		W.	45-5	239	e	39	28	+	18	—	—	15	46	11	+	16	15	53	14	N. 0	58		
Victoria, B.C.		M.	49-7	38	?	37	42	—	116	—	—	15	40	6	e	—	15	46	36	15	52	30	
Berkeley		—	55-9	69	e	43	20	+	182	—	—	—	—	—	—	—	—	—	—	—	—	—	
Calcutta	N.	O.E.	61-4	272	15	41	0	+	6	—	—	—	—	—	—	16	3	30	16	10	24		
	E.	O.E.	61-4	272	15	41	0	+	6	—	—	—	—	—	—	16	3	12	16	5	0		
Putkovo		G.	66-1	335	e	41	12	—	13	i	43	41	i	49	43	—	28	16	0	0	Z. 11	41	d
Batavia		W.	70-6	238	i	42	16	+	22	—	—	i	51	35	+	29	e	0	0	E. 16	0		
Bombay	E.	M.	74-5	281	15	42	56	+	37	—	—	—	—	—	—	—	—	—	—	16	17	24	
Dyce, Aberdeen	N.	M.	75-2	350	15	42	47	+	27	—	—	15	52	42	+	41	16	0	57	16	22	17	
	E.	M.	75-2	350	15	42	48	+	28	—	—	15	52	2	+	1	16	4	12	16	22	27	
Toronto		M.	75-7	40	15	52	18	?	S	—	—	?	52	18	+	11	16	18	36	16	24	24	e
Ottawa		B.	75-8	37	—	—	—	—	—	—	—	—	—	—	—	—	16	17	0	—	—	—	
Edinburgh	E.	M.	76-7	350	15	42	12	+	10	—	—	—	—	—	—	—	—	—	—	f	—	—	
Eskdalemuir		G.	77-2	350	i	42	38	+	3	15	45	54	15	52	14	—	10	16	7	5	E. 13	55	a
Kodakanal		M.	77-5	272	15	43	18	+	41	—	—	—	—	—	—	—	15	52	42	16	18	48	
Colombo	E.	M.	78-3	267	15	42	6	—	36	—	—	15	53	18	+	41	16	16	54	16	23	18	
Stonyhurst		M.	78-6	350	e	42	30	—	14	—	—	e	52	12	—	28	i	15	12	16	20	0	
Bidston	N.	M.S.	79-1	350	15	42	54	+	7	—	—	15	53	36	+	50	—	—	—	16	17	0	
De Bilt	N.	—	79-1	345	15	42	49	+	2	i	45	36	i	52	33	—	15	e	12	0	16	20	55
West Bromwich		M.	79-8	349	15	43	5	+	14	—	—	N	53	0	-	6	—	—	—	—	—	—	
Kew		M.	80-6	348	15	46	0	+	184	—	—	—	—	—	—	—	—	—	—	16	25	30	
Washington	N.	—	80-6	42	e	43	4	+	8	—	—	15	53	0	—	3	e	9	24	—	—	—	
	E.	—	80-6	42	e	43	2	+	6	—	—	i	52	57	—	6	e	9	24	—	—	—	
Sydney	E.	M.	80-7	187	h	54	0	?	S	16	0	36	15	54	0	+	55	16	27	30	16	30	30
Slide		M.S.	81-5	348	15	43	4	+	3	—	—	15	53	4	—	10	16	2	4	16	25	30	
		M.B.	81-5	348	15	43	4	+	3	—	—	15	53	4	—	10	16	2	4	16	28	24	
Paris		—	82-7	345	15	43	3	—	4	—	—	15	53	10	—	17	16	0	0	16	18	0	
Momeaheri		S.	85-3	341	15	43	10	—	13	i	43	21	i	53	37	—	18	15	59	8	E. 25	47	
Melbourne		M.	85-4	192	i	54	0	?	S	—	—	?	54	0	+	4	16	21	48	16	23	12	j

Monte Cassino	E.	V.	87.0	335	15 43 25	--	7	--	--	--	--	17 2 44	
Rocca di Papa		Aga.	87.0	336	15 43 23	--	9	--	15 53 48	--	26	e 3 9	16 28 42
Barcelona		Ma.	89.8	344	e 43 56	+	8	--	1 54 18	--	27	e 59 57	16 20 24
Helwan	E.	M.	90.6	317	15 43 24	--	28	--	15 54 30	--	23	--	16 31 6
Coimbra	N.	W.	92.7	351	15 47 7	--	+	183	--	--	--	16 16 15	16 24 16
	E.	W.	92.7	351	15 47 7	--	+	183	--	--	--	16 15 27	16 29 37
Rio Tinto		M.	92.7	351	--	--	--	--	15 54 41	--	34	--	--
		M.	94.9	349	15 46 0	+	104	--	1 54 55	--	20	--	--
Azores		M.	95.7	5	15 56 6	?	S	--	2 56 6	+	20	--	16 48 30
San Fernando	N.	M.	96.1	349	15 44 18	--	5	--	15 55 0	--	50	16 23 0	16 34 0
	E.	M.	96.1	349	15 44 0	--	23	--	15 56 0	+	10	16 23 0	16 33 0
Mauritius	N.	M.	112.5	264	15 56 12	+	270	--	--	--	--	16 21 12	16 35 24
	E.	M.	112.5	264	15 56 12	+	300	--	--	--	--	16 31 0	16 37 12
Accra		N.	--	125.1	336	--	--	--	--	--	--	--	16 50 0

NOTES.—*a*, P given as (PS) 15h. 35m. 59s. *b*, PSN 15h. 43m. 16s.; PSE 15h. 43m. 23s.; SR 15h. 45m. 37s.
c, O—C --40s. *d*, IP 15h. 41m. 14s.; O—C --11s.; MN 16h. 12m. 0s.; ME 16h. 12m. 22s.; 48° 0x. 154' 0E.
e, S 16h. 1m. 18s. *f*, M 16h. 15m. 30s. and 16h. 23m. 18s. *g*, MN 16h. 14m. 15s. *h*, S given as 16h. 5m. 36s. *i*, S given as P. *j*, S given as 16h. 3m. 48s.; PR₂ 16h. 0m. 12s.; SR₁ 16h. 10m. 6s.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	s.	H. M. S.	H. M. S.	s.	H. M. S.	H. M. S.	
Zi-ka-wei	W.	7.2	3	e 33 27	+ 5	—	e 34 55	+ 7	—	a	
Manila	W.	9.4	180	e 34 6	+ 11	—	22 36 2	+ 16	22 38 0	b	
Osaka	O.	16.5	46	e 36 0	+ 28	—	—	—	22 39 22	d	
Mizu-awa	N.	22.8	44	22 36 39	— 9	—	22 40 36	— 18	e 40 36	—	
	E.	22.8	44	22 36 35	— 13	—	22 40 39	— 15	e 40 39	—	
Calcutta	O.E.	30.0	273	22 37 54	— 7	—	22 50 54	f	—	z 51 33 g	
Irkutsk	N.	31.0	340	e 37 55	— 16	—	e 43 3	— 21	22 47 30	—	
	G.	31.0	340	22 38 1	— 10	—	—	—	—	—	
Batavia	W.	33.2	206	i 38 16	— 15	—	—	—	—	22 39 54	
Bombay	E.	44.9	272	22 45 49	? S	—	22 45 49	— 58	—	22 59 43	
Pulkovo	G.	69.8	328	22 42 47	— 2	—	22 51 54	— 3	23 5 0	h	i
Honolulu	M.	73.7	74	23 1 0	j	—	—	—	23 8 12	23 14 48	
Helwan	E.	77.9	297	22 54 0	? S	—	22 54 0	+ 28	—	—	
De Bilt	—	85.6	326	e 44 23	— 1	—	22 54 54	— 5	e 15 0	23 19 25	
Edinburgh	E.	86.8	332	22 55 24	? S	—	22 55 24	+ 12	—	k	
Rocca di Papa	Aga.	86.8	315	? 42 28	— 122	—	? 53 0	— 130	—	—	l
Eskdalemuir	G.	87.5	332	e 55 3	? S	—	22 55 3	— 17	23 14 0	E 19 43	
Victoria, B.C.	M.	87.6	37	—	—	—	—	—	23 25 6	—	
Moncalieri	S.	88.1	319	i 55 13	? S	—	22 55 13	— 14	23 16 35	m	
Stonyhurst	M.	88.2	330	e 55 6	? S	—	22 55 6	— 21	e 16 3	23 22 24	
Kew	M.	88.6	328	23 20 24	? L	—	—	—	—	23 25 12	
Bidston	N.	88.7	330	22 55 24	? S	—	22 55 24	— 9	—	23 22 36	
Paris	—	88.9	325	—	—	—	—	—	23 19 0	—	
Shide	M.S.	89.6	328	—	—	—	22 55 26	— 17	23 15 51	23 29 38	
	M.B.	89.6	328	—	—	—	22 55 26	— 17	23 15 53	23 29 46	
Barcelona	Ma.	93.5	319	—	—	—	—	—	e 22 49	23 32 0 n	
Coimbra	W.	100.4	324	—	—	—	—	—	e 23 30	—	
	M.	100.4	324	—	—	—	—	—	—	23 27 40	
Rio Tinto	M.	101.0	320	22 57 0	? S	—	22 57 0	— 38	—	23 40 0	
San Fernando	N.	101.6	319	23 6 30	o	—	—	—	23 29 30	—	
	E.	101.6	319	—	—	—	—	—	23 30 0	23 34 0	
Toronto	M.	109.8	16	—	—	—	—	—	23 15 6	—	

NOTES.—*a*, MN 22h. 36m. 21s.; ME 22h. 36m. 17s. *b*, MN 22h. 39m. 7s.; ME 22h. 38m. 25s.
d, MN 22h. 43m. 41s.; ME 22h. 45m. 38s. *e*, LN ?S 22h. 40m. 36s.; LE ?S.
g, 30°-9N., 133°-5E., and 31°-5N., 133°-0E. *h*, MN 23h. 10s. 10s.; ME 23h. 15m. 46s.
SR, 22h. 56m. 54s. *i*, O-C +1067s. *k*, M 23h. 22m. 24s. and 23h. 28m. 30s.
given as 23h., and ? to the S. *m*, MN 23h. 31m. 0s.; ME 23h. 23m. 15s.; S given as 23h. 5m. 21s.
n, e? 23h. 10m. 28s. *o*, O-C +1239s.

Station and Component.		Machine.	Distance from Elycentre.	Azimuth.	P.		O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
			°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	H. M. S.	
Berkeley	E.	—	27.8	320	6 32 6	+ 36	—	—	e 37 33	- 78	6 41 12	6 42 48	
Washington	N.	W.	28.8	39	e 31 33	- 7	—	—	6 36 27	- 10	—	—	
	E.	W.	28.8	39	e 31 32	- 8	—	—	6 36 24	- 13	a	—	
Toronto		M.	31.0	30	6 35 42	+ 220	—	—	6 38 48	+ 93	6 44 6	6 45 42	
		M.	31.0	30	6 36 30	+ 268	—	—	—	—	—	—	
Ottawa		B.	34.0	31	6 32 26	- 3	—	—	6 37 48	- 16	b	—	
Victoria, B.C.		M.	35.8	333	6 39 24	? S	—	—	6 39 24	+ 53	6 47 24	6 52 18	
		M.	35.8	333	—	—	—	—	—	—	v 47 0	v 50 18	
La Paz		—	46.6	136	i 33 29	- 39	—	—	6 39 7	- 113	6 45 48	N 49 52	
Honolulu		M.	54.5	284	6 36 12	+ 72	—	—	6 44 0	+ 81	6 53 54	6 57 12	
Azores		M.	66.9	56	6 45 0	? S	—	—	6 45 0	- 73	—	6 46 12	
Eskdalemuir		G.	79.0	35	z 37 44	+ 7	—	—	6 47 45	+ 9	7 4 49	c	
Edinburgh	E.	M.	79.0	35	z 37 54	+ 17	—	—	6 48 42	+ 66	—	7 16 30	
Coimbra	N.	W.	79.7	50	6 37 42	+ 1	—	—	i 47 33	- 11	7 7 0	e 7 5	
	E.	W.	79.7	50	—	—	—	—	6 47 33	- 11	7 3 53	f 9 37	
		M.	79.7	50	—	—	—	—	6 48 10	+ 26	—	7 7 47	
Bidston	N.	M.S.	79.9	37	6 47 48	? S	—	—	6 47 48	+ 2	—	7 11 30	
Shide		M.S.	81.5	39	6 37 58	+ 6	—	—	6 48 5	0	7 3 3	7 10 43	
		M.B.	81.5	39	—	—	—	—	6 47 58	- 7	7 2 53	7 10 33	
Kow		M.	81.9	38	6 47 30	? S	—	—	6 47 30	- 39	—	7 20 30	
San Fernando	N.	N.	82.3	54	—	—	—	—	6 48 0	- 13	7 10 0	7 13 0	
	E.	M.	82.3	54	—	—	—	—	6 48 0	- 13	7 8 30	7 11 0	
Paris		—	84.5	40	6 38 11	+ 2	—	—	6 48 32	- 6	7 6 0	7 15 0	
De Bilt		—	84.8	37	i 38 51	+ 40	—	—	6 48 36	- 5	e 5 0	7 6 4	
Barcelona		Ma.	86.9	47	—	—	—	—	6 48 52	- 12	7 7 23	7 20 0	
Moncaferri		S.	89.2	42	i 43 7	+ 272	—	—	6 56 50	d	7 6 24	e	
Pulkovo		G.	92.5	23	i 38 55	+ 1	i 42 33	—	6 50 10	- 6	7 7 0	7 8 19 f	
Irkutsk		G.	106.6	345	—	—	—	—	c ₁ 51 55	- 26	7 18 0	z 34 2 g	
Sydney	E.	M.	115.3	240	7 19 54	h	—	—	—	—	7 21 42	7 25 0	
Zi-ka-wei		W.	116.8	321	e 46 10	+ 318	—	—	—	—	—	7 54 39	
Melbourne		N.	120.5	236	7 23 24	i	—	—	—	—	7 29.24	7 34 18	
Bombay	E.	M.	142.4	11	7 14 0	j	—	—	—	—	—	—	
Batavia		W.	151.3	291	e 46 0	+ 159	—	—	—	—	—	6 49 0	

NOTES.—*a*, eLN 6h. 39m. 30s., and LN 6h. 44m. 13s.; eLE 6h. 39m. 36s. and 6h. 43m. 21s.; *b*, eL 6h. 40m. 24s.; LN 6h. 49m. 0s.;
 iLE 6h. 45m. 0s.; *c*, MN 7h. 6m. 39s.; ME 7h. 13m. 10s.; *d*, O-C +441s.; *e*, MN 7h. 17m. 14s.;
 MR 7h. 17m. 54s.; *f*, PS 6h. 51m. 24s.; i 6h. 49m. 26s.; SR₁ 6h. 56m. 0s.; SR₂ 6h. 59m. 30s.;
g, e₁ 6h. 44m. 30s.; e₂ 6h. 44m. 50s.; e₃ 6h. 50m. 55s.; e₄ 6h. 54m. 53s.; e₅ 7h. 0m. 12s.; *h*, O-C +2348s.;
i, O-C +2355s.; *j*, O-C +1875s.

1916. November 30d. 3h. 17m. 50s.

Epicentre 19° 0N. 70° 0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		c	c	H. M. S.	s.	H. M. S.	H. M. S.	s.	H. M. S.	H. M. S.	
Port-au-Prince	B.O.	2.1	260	3 19 34	+ 71	—	—	—	—	3 20 48	
Washington	N.	20.8	344	e 22 41	0	—	3 26 31	+ 1	e 27 24	3 33 45	
	E.	20.8	344	e 41 0	0	—	3 26 29	- 1	e 27 26	3 33 59	
	V.	20.8	344	e 22 33	8	—	—	—	—	—	
Toronto	M.	35.9	344	? 24 12	+ 35	—	3 28 24	+ 14	3 31 0	3 35 24	
Ottawa	N.	26.8	351	1 23 40	- 6	—	3 28 14	- 13	a	—	
La Paz	—	35.6	177	1 25 8	0	3 26 40	i 30 41	- 13	3 38 50	3 42 36	
Azores	M.	42.8	54	3 35 0	b	—	—	—	—	—	
Victoria, B.C.	M.	51.8	317	—	? 26	—	3 35 0	+ 29	c	3 51 30	
Coimbra	W.	56.4	53	3 27 38	0	—	3 35 22	- 7	d	c	
San Fernando	N.	58.0	58	3 36 30	—	—	3 36 30	+ 41	3 42 30	3 51 30	
	E.	58.0	58	3 37 30	—	—	3 37 30	+101	3 44 0	3 56 0	
Bidston	N.	61.2	39	3 38 18	? 26	—	3 38 18	+110	—	3 51 12	
Edinburgh	E.	61.4	36	3 28 24	+ 13	—	—	—	—	3 58 0	
Stonyhurst	M.	61.6	38	? 24 36	- 217	—	e 34 24	-129	—	3 49 0	
Shide	M.S.	62.0	42	—	—	—	3 36 39	+ 1	3 46 46	3 51 54	
	M.B.	62.0	42	—	—	—	3 36 36	- 2	3 46 41	3 52 46	
Kew	M.	62.7	41	3 46 0	? L	—	—	—	—	3 59 0	
Paris	—	64.4	44	3 28 35	+ 4	—	3 37 6	- 2	3 48 0	3 49 0	
Barcelona	Ma.	64.4	52	—	—	—	—	—	e 46 1	3 54 0	
De Bilt	—	66.1	41	3 28 48	+ 6	—	i 37 29	+ 1	3 49 24	3 58 11	
Moncalieri	S.	68.2	48	? 28 59	+ 4	—	i 37 56	+ 2	3 44 48	—	
Rocca di Papa	Aga.	72.2	51	c 29 21	0	—	—	—	—	3 30 24	
Pulkovo	G.	78.7	30	i 30 2	+ 1	3 32 43	3 39 53	- 5	3 50 0	z 58 58 g	
Honolulu	M.	81.4	290	3 58 30	h	—	—	—	4 4 18	4 10 12	
Helwan	E.	90.0	58	3 38 0	i	—	—	—	—	4 25 30	
Irkutsk	G.	108.6	4	—	—	—	—	—	4 5 0	E 21 20 j	

NOTES.—a, eL 3h. 30m. 18s.; L 3h. 34m. 0s. to 4h. 10m. 0s. b, O-C +533s. (S -145s. for O-C). c, L 3h. 48m. 12s., and 3h. 49m. 54s. d, LN 3h. 41m. 52s.; LE 3h. 44m. 24s. e, MN 3h. 44m. 0s.; ME 3h. 53m. 0s. f, MN 3h. 54m. 22s.; ME 3h. 57m. 37s. g, SR, 3h. 45m. 6s. h, O-C +1693s. i, +414s. j, c₁ 3h. 37m. 0s.; c₂ 3h. 46m. 24s.; c₃ 3h. 48m. 42s.; c₄ 3h. 52m. 30s.

1916. December 6d. 22h. 17m. 5s.

Epicentre 87°0N. 50°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Pulkovo	G.	27.5	202	i 22 57	- 11	---	i 27 42	- 13	22 29 12	22 33 3	
Ekaterinburg	G.	30.2	191	i 23 44	+ 9	---	22 28 44	+ 2	22 32 30	22 36 15	
Edinburgh	E. M.	32.4	237	22 30 18	? S	---	22 30 18	+ 59	---	22 33 24	
Eskdalemuir	G.	33.0	237	a	---	---	---	---	---	---	
Stonyhurst	M.	34.5	236	---	---	---	---	---	---	---	
Bidston	N. M.S.	34.9	236	22 29 42	? S	---	22 29 42	- 17	---	22 33 30	
De Bilt	---	35.9	228	N 24 13	- 13	---	E 29 52	- 21	c 33 0	22 36 18	
Irkutsk	G.	36.0	122	e 24 19	- 8	---	e 30 4	- 11	22 35 0	22 43 58	
Shide	M.S.	37.5	234	---	---	---	22 30 30	- 6	22 33 50	---	
Paris	---	39.3	230	e 24 41	- 13	---	e 30 48	- 14	22 35 0	22 50 0	
Moncalieri	S.	42.4	225	c 24 51	- 28	---	22 31 44	- 1	22 39 28	---	
Victoria, B.C.	M.	44.6	354	? 41 36	b	---	---	---	22 42 36	22 43 6	
Toronto	M.	48.3	312	---	---	---	---	---	22 47 30	---	
Helwan	E. M.	57.3	199	22 35 0	? S	---	22 35 0	+ 5	---	---	
Zi-ka-wei	W.	57.9	107	z 27 10	+ 7	---	---	---	---	---	

NOTES.—a, 22h. 29m. to 23h. 0m., no definite phases.

b, O-C +961s.

1916. December 14d. 16h. 52m. 16s.

Epicentre 49°0N. 174°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.			O-C.	PR ₁	S.			O-C.	L.			M.	Notes Ref.
				H.	M.	S.	S.	H.	M.	S.	S.	H.	M.	S.	H.	M.	
Mizusawa	N.	O.	25.3	260	16	58	19	+ 22	—	17	2	53	+ 28	—	—	—	
	E.	O.	25.3	260	16	58	19	+ 22	—	17	2	53	+ 28	—	—	—	
Osaka		O.	31.7	260	16	59	24	+ 24	—	17	4	35	+ 16	17	7	35	17 10 39
Honolulu		M.	35.5	131	—	—	—	—	—	—	—	—	—	17	8	0	17 17 0
Victoria, B.C.		M.	40.1	66	?	5	12	? S	—	?	5	12	- 72	17	12	36	17 18 36
Irkutsk		G.	42.6	302	i	0	29	- 2	—	17	6	58	- 1	17	13	0	N 15 52
Zi-ka-wei		W.	43.0	267	17	0	45	+ 11	—	e	7	17	+ 13	—	—	—	17 21 22 a
Berkeley		—	46.2	79	—	—	—	—	—	e	10	54	+187	—	—	—	17 16 4
Manila		W.	55.2	250	e	2	33	- 37	—	—	—	—	—	—	—	—	17 16 4 b
Ekaterinburg		G.	60.7	325	i	2	52	+ 19	i	5	10	17 11 8	+ 20	17	19	0	17 22 53 c
Pulkovo		G.	67.3	341	i	3	18	+ 2	—	i	12	12	+ 2	17	21	0	E 25 14
Toronto		M.	67.3	49	?	4	42	+ 86	—	17	d	18	+128	17	20	42	17 35 0
Ottawa	E.	B.	67.8	45	17	3	14	- 5	—	17	12	22	+ 6	17	23	44	—
Washington	N.	—	72.0	51	17	3	41	- 5	—	17	12	47	- 19	17	23	44	—
	E.	—	72.0	51	17	3	41	- 5	—	17	12	45	- 21	17	23	30	—
Edinburgh		M.	75.0	358	17	13	30	? S	—	17	13	30	- 12	—	—	—	17 48 0
Ekdaiemuir	E.	G.	75.6	358	17	4	9	0	—	17	13	40	- 9	—	—	—	17 18 56
Stonyhurst		M.	77.1	357	17	14	30	? S	—	17	14	30	+ 24	—	—	—	17 45 30
Bidston	N.	M.S.	77.5	358	17	4	30	+ 10	—	17	14	18	+ 7	—	—	—	17 46 12
De Bilt		—	78.4	353	e	4	28	+ 3	—	17	14	22	0	17	30	0	17 39 48
Kew		M.	79.4	356	—	—	—	—	—	—	—	—	—	—	—	—	17 48 0
Shide		M.S.	80.1	357	17	4	34	- 2	—	17	14	34	- 6	17	26	36	17 42 56
		M.B.	80.1	357	—	—	—	—	—	17	14	36	- 4	—	—	—	17 42 59
Paris		—	81.9	354	17	4	44	- 2	—	17	14	55	- 6	17	32	0	17 39 0
Bombay	E.	M.	82.9	291	17	36	30	e	—	—	—	—	—	—	—	—	17 44 12
Sydney	E.	M.	85.3	199	17	17	18	? S	—	?	17	18	+100	—	—	—	17 40 30
Kodakanal		M.	86.6	281	17	41	0	f	—	—	—	—	—	—	—	—	—
Rocca di Papa		Aga.	87.6	346	17	5	23	+ 4	—	17	8	47	g	—	—	—	—
Melbourne		M.	90.6	203	17	37	42	h	—	—	—	—	—	—	—	—	17 41 36
Rio Tinto		M.	93.1	359	17	17	0	? S	—	17	17	0	- 2	—	—	—	17 55 0
Helwan	E.	M.	94.3	328	17	17	0	? S	—	17	17	0	- 15	—	—	—	—
La Paz		—	120.5	80	17	11	29	+ 208	—	17	24	28	+199	18	1	0	N 10 35

Notes.—a, i, 17h. 2m. 21s. e, O-C +1899s. b, e 21m. 33s. f, O-C +2147s. = M? c, e₁ 17h. 6m. 4s.; e₂ 17h. 7m. 36s. g, O-C -437s. d, S 14m.? h, O-C +1927s.

Lb

1916. December 23d. 9h. 24m. 11s.

Epicentre 24°0S. 69°0W.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.		O-C.	PR ₁	S.		O-C.	L.	M.	Notes Ref.
				H. M. S.	s.	H. M. S.	H. M. S.	s.	H. M. S.	H. M. S.			
La Paz	—	7.6	36	1 26 15	—	+	—	9 27 45	+	—	—	—	
Washington	N. W.	63.4	353	9 34 40	—	+	—	9 43 8	—	—	—	—	
	E. W.	63.4	353	9 34 52	—	+	—	9 43 5	—	—	9 53 25	—	
Toronto	N. M.	68.3	332	9 44 42	—	+	—	9 44 42	+	25	10 5 30	10 6 30	
Ottawa	N. E.	69.7	355	—	—	—	—	? 44 14	—	19	e 4 24	—	
	E. B.	69.7	355	—	—	—	—	i 44 24	—	9	10 10 0	—	
Capetown	E. M.	75.0	121	9 36 18	—	+	—	10 2 48	a	—	10 20 6	10 22 18	
San Fernando	E. M.	84.6	46	9 37 30	—	+	—	9 48 30	+	64	10 11 30	10 30 0	
Rio Tinto	M.	85.1	45	9 36 0	—	—	—	—	—	—	—	10 17 0	
Coimbra	W.	85.5	41	9 36 59	—	—	—	9 47 15	—	21	b	—	
Victoria, B.C.	M.	87.2	327	9 48 12	—	? S	—	9 48 12	+	18	? 6 0	10 15 54	
Barcelona	M.	92.8	46	e 36 45	—	—	—	e 48 13	—	41	e 6 24	10 21 48	d
Slide	M.S.	95.5	36	—	—	—	—	—	—	—	—	10 17 55	
	M.B.	95.5	36	9 37 43	—	—	—	9 49 3	—	18	—	—	
Bid-son	N. M.S.	96.0	33	9 42 12	—	+	—	9 49 12	—	15	—	10 19 30	
Kew	M.	96.4	36	9 49 0	—	? S	—	9 49 0	—	31	—	10 20 0	
Stonyhurst	M.	96.6	33	e 37 36	—	—	—	e 44 12	—	321	—	10 13 42	
Paris	—	96.7	39	—	—	—	—	—	—	—	10 15 0	10 26 0	
Eskdalemuir	G.	96.9	32	9 37 49	—	+	—	—	—	—	—	e	
Edinburgh	E. M.	97.3	31	9 41 30	—	+	—	9 11 51	N	49 25	—	10 20 12	
Honolulu	M.	97.6	290	9 48 24	—	? S	—	—	—	—	—	10 14 24	
Moncalieri	S.	98.0	44	9 42 1	—	+	—	9 48 24	—	79	10 5 24	10 20 0	
De Bilt	—	99.7	37	—	—	—	—	9 51 1	+	74	10 4 26	10 20 3	
Rocca di Papa	Aga.	100.0	49	—	—	—	—	e 42 19	N	49 44	—	—	
Helwan	E. M.	110.2	65	9 43 0	—	+	—	—	—	—	e 26 53	—	
Melbourne	M.	110.5	208	—	—	—	—	—	—	—	e 20 6	10 32 36	
Sydney	E. M.	110.6	215	9 49 18	—	? S	—	? 49 18	—	146	—	10 26 30	
Mauritius	N. M.	112.0	126	9 39 18	—	—	—	—	—	—	—	10 19 30	
Pulkovo	G.	115.2	33	—	—	—	—	—	—	—	9 52 48	—	
Ekaterinburg	G.	122.1	34	—	—	—	—	9 43 59	—	—	10 13 0	E 25 55	h
Bombay	E. M.	144.2	91	9 57 52	—	? S	—	i 53 10	—	6	10 21 0	10 35 53	i
Kodaikanal	M.	145.2	108	10 5 42	—	—	—	? 57 52	+	134	—	10 51 21	
Colombo	E. M.	145.5	115	9 43 30	—	+	—	—	—	—	19 43 0	10 55 42	
Batavia	W.	149.5	176	e 43 0	—	+	—	—	—	—	—	11 0 0	

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Mizusawa	S.	O.	150.5	307	9 44 9	+ 125	---	---	---	---	---
Calcutta	N.	O.E.	159.2	89	9 44 18	+ 101	---	---	---	---	---
	E.	O.E.	159.2	89	9 44 30	+ 113	---	---	---	---	---
Manila		W.	166.7	227	7 44 42	+ 91	---	---	---	9 54 46	---
Zi-ka-wei		W.	168.3	310	9 44 30	+ 83	---	---	---	9 42 23	9b

Notes.—*g*, O-C +1031s. *b*, LN 10h. 9m. 55s.; LE 10h. 8m. 47s. *c*, MN 10h. 13m. 47s.; ME 10h. 14m. 7s.
d, PS 9h. 48m. 52s. *e*, MN 10h. 17m. 18s.; ME 10h. 19m. 23s. *f*, MN 10h. 24m. 0s.; ME 10h. 24m. 30s.
g, MN 10h. 20m. 36s.; ME 10h. 21m. 24s. *h*, PR, 9h. 47m. 12s.; i 9h. 49m. 38s.; PS 9h. 53m. 45s.; ST, 9h. 59m. 48s.
i, iP 9h. 43m. 46s. *j*, O-C +1439s. *k*, MN 9h. 56m. 38s.; ME 9h. 56m. 11s. *l*, c 9h. 44m. 42s.
m, SMZ 9h. 49m. 33s.

1916. December 24d. 7h. 53m. 6s.

Epicentre 30°0N. 80°0E.

Station and Component.	Machine.	Distance from Epicentre.	Azimuth.	P.	O-C.	PR ₁	S.	O-C.	L.	M.	Notes Ref.
		°	°	H. M. S.	S.	H. M. S.	H. M. S.	S.	H. M. S.	H. M. S.	
Calcutta	N. O.E.	10.5	133	7 55 42	- 1	---	7 57 36	- 12	---	---	---
	E. O.E.	10.5	133	7 55 42	- 1	---	7 57 30	- 18	---	---	---
Bombay	E. M.	12.9	212	8 0 12	+ 234	---	---	---	---	8 1 24	
Kodaikanal	M.	20.0	187	---	---	---	---	---	---	8 4 54	
Colombo	E. M.	23.1	181	8 3 0	+ 276	---	8 6 30	+ 237	8 3 24	8 8 6	
Irkutsk	G.	28.5	32	c 59 16	+ 3	---	e 4 6	- 8	8 7 36	8 10 38	
Rkaterinburg	G.	30.1	20	i 59 45	+ 10	---	i 4 43	+ 1	8 7 30	8 12 34	
Helwan	E. M.	41.8	282	8 11 0	+ a	---	---	---	---	---	
Pulkovo	G.	44.5	327	i 1 39	+ 3	---	i 8 10	- 5	8 13 0	E 21 11 6	
Mamifius	N. M.	54.4	206	8 18 42	c	---	---	---	---	8 21 42	
	E. M.	54.4	206	8 20 30	c	---	---	---	---	---	
Kew	M.	61.2	316	---	---	---	---	---	---	8 33 0	
Edinburgh	E. M.	61.9	321	8 4 30	+ 60	---	---	---	---	8 33 18	
Eskdalemuir	C.	62.0	320	d	---	---	---	---	---	---	
Bidston	N. M.S.	62.4	318	8 30 6	c	---	---	---	---	8 36 18	
La Paz	---	147.9	288	8 13 26	+ 157	---	---	---	---	---	f

NOTES.—a, O-C +585s. phases. b, SP, Sh. 11m. 30s. c, O-C +1592s. = L? d, Sh. 25m. to Sh. 40m; no definite e, O-C N +959s., E +1067s. f, Five quakes between 6h. and 9h.

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APPENDIX I.

LIST OF
EPICENTRES OF ALL EARTHQUAKES
IN 1916.

In the following list the time at epicentre is given to 1^s, and the latitude and longitude of epicentre to 0°·1 for all earthquakes given in detail in the previous pages. The opportunity is taken to add alternative determinations of epicentre made elsewhere. For the smaller earthquakes, for which the observations received do not give good determinations, an approximate time (to 1min. only) and epicentre (to 1° only) are now given, with a list of stations at which either P or S was observed (or both).

- Jan. 1d. 13h. 20m. 13s. 5°·5S. 154°·0E. (Shide); 2°·9N. 153°·5E. (Ekaterinburg); 4°·6S. 148°·6E. (Granada); 0°·3S. 158°·3E. (Irkutsk); 4°·0S. 153°·0E. (Ottawa); 0° 151°·0E. (Pulkovo).
- Jan. 4d. 3h. 12m. 10°·8N. 122°·4E. (De Bilt); 7°·5N. 104°·5E. (Irkutsk); P. and S. available for Batavia, Ekaterinburg, Helwan, Irkutsk, Manila, Pulkovo, Tashkent, Zi-ka-wei.
- Jan. 7d. 13h. 15m. 8°·0S. 111°·0E. (Oxford); Batavia, Ekaterinburg, Irkutsk, La Paz, Mizusawa, Riverview, Sydney, Tashkent, Zi-ka-wei.
- Jan. 13d. 6h. 18m. 16s. 2°·0S. 137°·0E. (Shide); 5°·0S. 135°·0E. (Granada); 2°·7S. 130°·3E. (Ekaterinburg); 2°·5S. 139°·0E. (Ottawa); 1°·0N. 137°·0E. (Pulkovo); 5°·0S. 137°·0E. (Riverview); 3°·0S. 140°·0E. (Sydney).
- Jan. 13d. 8h. 20m. 25s. 2°·5S. 139°·0E. (Shide); 3°·9S. 128°·8E. (Ekaterinburg); 5°·0S. 135°·0E. (Granada); 0°·3S. 141°·8E. (Irkutsk); 2°·5S. 139°·0E. (Ottawa); 1°·0N. 138°·0E. (Pulkovo); 3°·0S. 142°·0E. (Sydney).
- Jan. 13d. 10h. 50m. 45s. 2°·5S. 136°·5E. (Shide).
- Jan. 15d. 7h. 37s. 41°·3N. 71°·2E. (Tashkent); Tashkent (local).
- Jan. 18d. 1h. 7m. 37°·0N. 69°·3E. (Tashkent); Tashkent (local).
- Jan. 19d. 13h. 56m. 0°·6N. 158°·2E. (Irkutsk); 15°·4S. 122°·8E. (Ottawa); 8°·0N. 154°·0E. (Tashkent). Batavia, Berkeley, Colombo, Edinburgh, Ekaterinburg, Helwan, Honolulu, Irkutsk, Kodaikanal, La Paz, Makeyevka, Manila, Melbourne, Mizusawa, Perth (W.A.), Pulkovo, Riverview, Sydney, Tashkent, Tiflis, Toronto, Victoria (B.C.), Zi-ka-wei.
- Jan. 24d. 6h. 55m. 7s. 41°·0N. 37°·0E. (Shide); 41°·2N. 36°·5E. (Granada); 42°·5N. 35°·4E. (Irkutsk); 41°·3N. 36°·5E. (Ottawa); 39°·5N. 33°·5E. (Pulkovo); 39°·5N. 33°·2E. (Tashkent).
- Jan. 26d. 7h. 37m. 53s. 46°·0N. 25°·0E. (Shide); 44°·9N. 25°·3E. (Ekaterinburg); 35°·2N. 36°·2E. (Irkutsk); 45°·4N. 23°·7E. (Ottawa); 46°·0N. 26°·0E. (Pulkovo); 46°·3N. 23°·0E. (Tiflis).

- Jan. 26d. 12h. 25m. 20°-0S. 176°-6W. (Ottawa). Adelaide, De Bilt, Melbourne, Monte Cassino, Perth (W.A.), Riverview, Sydney, Tashkent.
- Feb. 1d. 7h. 36m. 22s. 29°-5N. 131°-5E. (Shide); 31°-2N. 133°-5E. (Ekaterinburg); 29°-9N. 132°-5E. (Pulkovo); 28°-1N. 131°-2E. (Ottawa); 23°-0N. 125°-0E. (Tashkent); 40°-1N. 139°-8E. (Tiflis).
- Feb. 6d. 19h. 51m. 13s. 41°-0N. 156°-5E. (Shide); 41°-8N. 152°-5E. (Ekaterinburg); 36°-2N. 151°-1E. (Irkutsk); 46°-5N. 166°-1E. (Makeyevka); 37°-5N. 151°-5E. (Ottawa); 40°-6N. 151°-5E. (Pulkovo); 46°-7N. 157°-6E. (Tashkent).
- Feb. 6d. 14h. 39m. 39°-0N. 37°-0E. (Pulkovo). Batavia, Bidston, Edinburgh, Ekaterinburg, Helwan, Irkutsk, Makeyevka, Padova, Paris, Pompeii, Pulkovo, Rocca, Tashkent, Tiflis.
- Feb. 6d. 21h. 51m. 19s. 48°-5N. 178°-5E. (Shide); 49°-3N. 178°-9E. (Ekaterinburg); 50°-1N. 177°-5W. (Irkutsk); 46°-8N. 161°-8E. (Makeyevka); 50°-0N. 180°-0E. (Ottawa); 48°-8N. 173°-2E. (Pulkovo); 49°-0N. 176°-0W. (Tashkent).
- Feb. 8d. 15h. 34m. 14°-0S. 75°-8W. (Ottawa). Capetown, Ekaterinburg, Granada, Harvard Univ., Helwan, Honolulu, Irkutsk, La Paz, Manila, Osaka, Stonyhurst, Tashkent, Toronto, Washington.
- Feb. 9d. 23h. 33m. 55°-0N. 178°-0W. (Irkutsk). Ekaterinburg, Honolulu, Irkutsk, Pulkovo, Tashkent.
- Feb. 14d. 10h. 1m. 31s. 5°-0N. 128°-0E. (Shide); 4°-5N. 125°-5E. (Ekaterinburg); 4°-2N. 127°-0E. (Irkutsk); 17°-4N. 138°-5E. (Tashkent).
- Feb. 15d. 11h. 35m. 52s. 61°-5N. 145°-0W. (Shide); 59°-3N. 152°-2W. (Ekaterinburg); 56°-2N. 154°-9W. (Irkutsk); 65°-0N. 145°-5W. (Ottawa); 61°-0N. 150°-0W. (Pulkovo).
- Feb. 20d. 17h. 47m. 35s. 51°-0N. 169°-0W. (Shide); 49°-6N. 169°-2W. (Ekaterinburg); 52°-0N. 162°-0W. (Eskdalemuir); 50°-4N. 165°-6W. (Granada); 50°-6N. 166°-4W. (Irkutsk); 51°-0N. 167°-5W. (Makeyevka); 51°-8N. 168°-0W. (Ottawa); 52°-0N. 168°-0W. (Pulkovo); 54°-8N. 167°-8W. (and 52°-0N. 162°-0W.); also 10°-8S. 82°-2W. (Granada).
- Feb. 22d. 9h. 11m. 29°-6N. 128°-8E. (Ekaterinburg); 37°-0N. 141°-0E. (Pulkovo); 24°-0N. 130°-0E. (Tashkent); also 20h. 7°-0S. 151°-0E. (Tashkent). Ekaterinburg, Ekaterinburg, Irkutsk, La Paz, Manila, Makeyevka, Mizusawa, Osaka, Pulkovo, Tashkent, Tiflis, Zi-ka-wei.
- Feb. 27d. 20h. 20m. 36s. 10°-5N. 91°-0W. (Shide); 11°-2N. 86°-1W. (Granada); 10°-0N. 87°-6W. (Ottawa); 16°-5N. 88°-2W. (Pulkovo).
- Feb. 28d. 13h. 15m. 40°-9N. 72°-6E. (Ekaterinburg); 40°-7N. 81°-1E. (Tashkent). Bidston, De Bilt, Ekaterinburg, Eskdalemuir, Helwan, Irkutsk, Makeyevka, Moncalieri, Paris, Pulkovo, Tashkent, Tiflis.
- Feb. 29d. 18h. 55m. 40°-6N. 78°-2E. (Ekaterinburg); 40°-5N. 23°-4E. (Tashkent). Calcutta, Edinburgh, Ekaterinburg, Helwan, Irkutsk, Makeyevka, Monte Cassino, Paris, Pulkovo, Rocca di Papa, Tashkent, Tiflis.
- March 1d. 18h. 1m. 25°-3N. 126°-8E. (Tashkent). De Bilt, Ekaterinburg, Granada, Helwan, Irkutsk, La Paz, Makeyevka, Manila, Mizusawa, Osaka, Pulkovo, Tashkent, Tiflis, Zi-ka-wei.
- March 4d. 7h. 9m. 4°-5S. 153°-2E. (Ekaterinburg). Batavia, Bidston, Edinburgh, Ekaterinburg, Granada, Harvard Univ., Helwan, Honolulu, Irkutsk, Kodaikanal, La Paz, Makeyevka, Manila, Mauritius, Melbourne, Perth, Pulkovo, Riverview, Tiflis, Victoria (B.C.), Zi-ka-wei.
- March 7d. 13h. 35m. 38°-8N. 40°-4E. (Ekaterinburg); 37°-6N. 42°-5E. (Makeyevka); 38°-2N. 43°-9E. (Pulkovo). Ekaterinburg, Makeyevka, Pulkovo, Tiflis.
- March 12d. 3h. 23m. 52s. 45°-0N. 16°-0E. (Shide); 45°-2N. 16°-0E. (Pulkovo); 45°-0N. 11°-5E. (West Bromwich); 45°-1N. 14°-9E. (Zagreb).
- March 12d. 7h. 31m. 12°-0N. 90°-0W. (Ottawa). Bidston, De Bilt, Edinburgh, Ekaterinburg, Granada, Harvard Univ., Helwan, Honolulu, Irkutsk, Kew, La Paz, Makeyevka, Manila, Ottawa, Pulkovo, Stonyhurst, Tashkent, Tiflis, Toronto, Victoria (B.C.), Washington.
- March 12d. 15h. 59m. 38°-5N. 79°-7E. (Ekaterinburg). Ekaterinburg, Makeyevka, Pulkovo, Tashkent, Tiflis.
- March 18d. 9h. 55m. 46s. 42°-5N. 144°-0E. (Shide); 44°-7N. 144°-2E. (Irkutsk); 42°-0N. 144°-0E. (Ottawa); 42°-4N. 141°-9E. (Pulkovo).

- March 20d. 19h. 18m. 40°-2N. 38°-9E. (Pulkovo); 37°-0N. 38°-0E. (Tashkent).
Edinburgh, Helwan, Makeyevka, Pulkovo, Tashkent.
- March 25d. 23h. 52m. 17s. 24°-0N. 124°-0E. (Shide); 21°-6N. 124°-3E. (Irkutsk);
24°-0N. 123°-0E. (Pulkovo); 25°-6N. 126°-0E. (Tashkent).
- March 30d. 1h. 43m. 6°-0N. 153°-0E. (Tashkent). Bidston, Edinburgh, Ekaterin-
burg, Helwan, Makeyevka, Manila, Mizusawa, Pulkovo, Stonyhurst, Tash-
kent, Tiflis, Zi-ka-wei.
- March 31d. 11h. 10m. 40°-6N. 116°-6W. (Ottawa). Berkeley, Bidston, De Bilt,
Edinburgh, Ekaterinburg, Eskdalemuir, Harvard Univ., Helwan, Hono-
lulu, Irkutsk, Ottawa, Pulkovo, Rocca di Papa, Tashkent, Victoria (B.C.),
Washington.
- April 4d. 6h. 23m. 37°-0N. 101°-0E. (Tashkent). Ekaterinburg, Tashkent.
- April 7d. 9h. 26m. 3s. 29°-0S. 53°-5E. (Shide); 32°-0S. 54°-0E. (De Bilt); 32°-7S.
55°-3E. (Ottawa); 25°-0S. 52°-0E. (Pulkovo); 32°-0S. 49°-0E. (Tashkent).
- April 11d. 3h. 11m. 60°-0S. 45°-0W. (Ottawa). Capetown, Edinburgh, Eskdalemuir,
Harvard Univ., Helwan, La Paz, Makeyevka, Moncalieri, Pulkovo, Rocca
di Papa, San Fernando, Tashkent, Toronto, Victoria (B.C.), Washington,
Zi-ka-wei.
- April 14d. 20h. 31m. 16°-6N. 101°-1W. (Ottawa). Berkeley, De Bilt, Edinburgh,
Ekaterinburg, Harvard Univ., Helwan, La Paz, Ottawa, Pulkovo, San
Fernando, Tashkent, Tiflis. Another quake at 21h., similar area.
- April 15d. 12h. 31m. 32s. 3°-5S. 102°-5E. (Shide); 1°-4S. 101°-1E. (Ottawa);
1°-7S. 105°-6E. (Pulkovo); 5°-6S. 100°-5E. (Tashkent).
- April 15d. 14h. 57m. 0°-2N. 123°-4E. (Tashkent). Bombay, Calcutta, Colombo,
Ekaterinburg, Kodaikanal, La Paz, Manila, Melbourne, Mizusawa, Osaka,
Perth, Pulkovo, Riverview, Tashkent, Tiflis.
- April 16d. 22h. 27m. 21°-0N. 108°-0W. (Pulkovo). Berkeley, De Bilt, Ekaterin-
burg, Harvard Univ., La Paz, Lick, Makeyevka, Mizusawa, Ottawa, Pul-
kovo, Toronto, Victoria (B.C.), Washington.
- April 18d. 4h. 1m. 39s. 55°-0N. 169°-0W. (Shide); 52°-8N. 181°-2E. (Ekaterinburg);
57°-0N. 172°-0W. (Ottawa); 53°-5N. 178°-3E. (Pulkovo).
- April 21d. 11h. 31m. 45s. 34°-0N. 139°-5E. (Shide); 33°-6N. 132°-4E. (De Bilt);
33°-3N. 141°-0E. (Ottawa); 33°-0N. 139°-3E. (Pulkovo).
- April 21d. 13h. 56m. 6s. 39°-5N. 72°-0E. (Shide); 41°-3N. 71°-3E. (Pulkovo).
- April 22d. 4h. 32m. 42°-0N. 13°-5E. (Pulkovo). Ekaterinburg, Makeyevka, Monca-
lieri, Monte Cassino, Padova, Pompeii, Pulkovo, Rocca di Papa.
- April 24d. 4h. 26m. 28s. 18°-5N. 68°-0W. (Shide); 18°-6N. 68°-4W. (Ottawa);
19°-0N. 68°-0W., and 17°-5N., 69°-0W. (Pulkovo).
- April 24d. 8h. 2m. 8s. 10°-0N. 82°-0W. (Shide); 11°-0N. 86°-0W. (Ottawa); 13°-3M.
84°-1W. (Pulkovo).
- April 24d. 17h. 19m. 6°-0N. 152°-0E. (Tashkent). Ekaterinburg, La Paz, River-
view, Tashkent.
- April 26d. 2h. 21m. 14s. 9°-5N. 84°-0W. (Shide); 9°-5N. 82°-6W. (Ottawa); 15°-0N.
90°-0W. (Pulkovo).
- April 26d. 6h. 25m. 8°-7N. 84°-2W. (Ottawa). Bidston, De Bilt, Edinburgh,
Ekaterinburg, Eskdalemuir, Harvard Univ., Honolulu, La Paz, Makeyevka,
Moncalieri, Ottawa, Pulkovo, Stonyhurst, Tiflis, Victoria (B.C.), Zi-ka-wei.
- April 26d. 7h. 16m. 7°-8N. 83°-6W. (Ottawa). Helwan, La Paz, Pulkovo, Washing-
ton.
- April 30d. 18h. 37m. 37°-1N. 69°-5E. (Tashkent). Ekaterinburg, Makeyevka,
Pulkovo, Tashkent, Tiflis.
- May 7d. 11h. 13m. 37°-6N. 128°-1E. (Tashkent). De Bilt, Edinburgh, Ekaterin-
burg, Helwan, Makeyevka, Manila, Pulkovo, Tashkent, Tiflis, Zi-ka-wei.
- May 9d. 14h. 33m. 27s. 0°-5N. 88°-5E. (Shide); 5°-3N. 96°-9E. (Ekaterinburg);
2°-0N. 86°-5E. (Ottawa); 4°-0N. 96°-0E. (Pulkovo).
- May 10d. 21h. 36m. 8°-0N. 83°-1W. (Ottawa); 14°-0N. 89°-0W. (Pulkovo). Azores,
Barcelona, Berkeley, Bidston, Coimbra, De Bilt, Edinburg, Eskdalemuir,
Harvard Univ., Helwan, Honolulu, La Paz, Lick, Manila, Moncalieri,
Ottawa, Paris, Pulkovo, Rio Tinto, Rocca di Papa, San Fernando, Tash-
kent, Toronto, Washington.

- May 11d. 3h. 5m. 79°-0N. 2°-0W. (Pulkovo). Pulkovo.
- May 14d. 12h. 12m. 41°-9N. 47°-2E. (Ekaterinburg); 40°-1N. 49°-0E. (Pulkovo).
Edinburgh, Ekaterinburg, Eskdalemuir, Helwan, Makeyevka, Pulkovo.
- May 14d. 23h. 54m. 29°-5N. 128°-9E. (Ekaterinburg). Edinburgh, Ekaterinburg,
Helwan, Makeyevka, Manila, Mizusawa, Osaka, Paris, Pulkovo, Rocca di
Papa, San Fernando, Zi-ka-wei.
- May 17d. 12h. 50m. 46°-8N. 14°-7E. (Ekaterinburg); 44°-5N. 11°-2E. (Pulkovo).
Barcelona, Bidston, De Bilt, Edinburgh, Ekaterinburg, Eskdalemuir,
Helwan, Kew, Moncalieri, Monte Cassino, Paris, Pompeii, Pulkovo, Rio
Tinto, Rocca di Papa, San Fernando, Tashkent, Tiflis.
- May 17d. 14h. 48m. 42°-7N. 77°-8E. (Ekaterinburg); 42°-4N. 78°-1E. (Pulkovo).
Bidston, Bombay, Calcutta, Edinburgh, Ekaterinburg, Eskdalemuir,
Makeyevka, Moncalieri, Paris, Pulkovo, Rocca di Papa, Tashkent.
- May 20d. 22h. 14m. 39°-2N. 19°-6E. (Pulkovo). Barcelona, De Bilt, Edinburgh,
Helwan, Makeyevka, Moncalieri, Paris, Pompeii, Pulkovo, Rocca di Papa,
Tashkent, Tiflis.
- May 21d. 11h. 51m. 23°-0N. 129°-0E. (Pulkovo). Batavia, Ekaterinburg, La Paz,
Makeyevka, Manila, Mizusawa, Osaka, Pulkovo, Riveview, Tashkent,
Zi-ka-wei.
- May 23d. 22h. 44m. 19°-2N. 62°-7E. (Pulkovo); 17°-7N. 52°-4E. (Ekaterinburg).
Bidston, De Bilt, Edinburgh, Ekaterinburg, Helwan, Kodaikanal, Manila,
Makeyevka, Mauritius, Moncalieri, Paris, Pulkovo, Rocca di Papa, San
Fernando.
- June 2d. 13h. 50m. 18°-0N. 95°-0W. (Ottawa); 21°-0N. 90°-0W. (Pulkovo). Azores,
Barcelons, Bidston, Coimbra, De Bilt, Edinburgh, Ekaterinburg, Esk-
dalemuir, Helwan, Honolulu, La Paz, Makeyevka, Manila, Moncalieri,
Ottawa, Paris, Port-au-Prince, Pulkovo, Rio Tinto, Rocca di Papa, San
Fernando, Tiflis, Victoria, Washington.
- June 9d. 21h. 23m. 59s. 5°-0N. 128°-0E. (Shide); 8°-2N. 126°-5E. (Ekaterinburg);
8°-2N. 130°-5E. (Ottawa); 6°-0N. 125°-0E. (Pulkovo).
- June 14d. 14h. 7m. 21°-0N. 71°-0E. (Pulkovo). De Bilt, Edinburgh, Helwan,
Kodaikanal, Moncalieri, Pulkovo, Rocca di Papa.
- June 15d. 11h. 11m. 12°-0S. 110°-0E. (Oxford); 10°-0S. 113°-0E. (Riverview).
Adelaide, Batavia, Bidston, Bombay, Capetown, Colombo, Edinburgh,
Ekaterinburg, Eskdalemuir, Helwan, Honolulu, Kew, Kodaikanal, La Paz,
Makeyevka, Manila, Moncalieri, Ottawa, Paris, Pulkovo, Rio Tinto, River-
view, San Fernando, Tiflis, Victoria (B.C.), Zi-ka-wei.
- June 19d. 3h. 50m. 16°-0N. 57°-0E. (Pulkovo). Batavia, Bidston, De Bilt,
Edinburgh, Ekaterinburg, Makeyevka, Moncalieri, Paris, Rocca di Papa,
Pulkovo, Tiflis, Zi-ka-wei.
- June 21d. 0h. 59m. 15°-7N. 52°-1E. (Ekaterinburg). Ekaterinburg, Helwan,
Makeyevka, Pulkovo, Tiflis.
- June 21d. 19h. 56m. 9s. 34°-5N. 77°-0E. (Shide); 39°-5N. 74°-2E. (Ekaterinburg).
- June 21d. 21h. 32m. 33s. 17°-0S. 57°-0W. (Shide); 17°-7S. 57°-3W. (Ottawa).
- June 24d. 4h. 3m. 15°-7N. 52°-0E. (Ekaterinburg); 14°-0N. 59°-0E. (Pulkovo).
Bombay, Colombo, De Bilt, Edinburgh, Ekaterinburg, Eskdalemuir,
Helwan, Moncalieri, Pulkovo, Rocca di Papa, Tiflis.
- June 24d. 6h. 49m. 51°-0N. 179°-0E. (Pulkovo). Berkeley, De Bilt, Edinburgh,
Ekaterinburg, Eskdalemuir, La Paz, Ottawa, Paris, Pulkovo, Rocca di
Papa, Tiflis.
- June 30d. 3h. 0m. 6s. 0°-5N. 82°-0W. (Shide); 2°-1N. 83°-2W. (De Bilt); 2°-0N.
92°-0W. (Eskdalemuir); 1°-0N. 81°-4W. (Ottawa).
- July 3d. 18h. 59m. 25°-0N. 136°-0E. (Pulkovo). Ekaterinburg, La Paz, Manila,
Osaka, Pulkovo, Rio Tinto, Tiflis, Zi-ka-wei.
- July 4d. 3h. 10m. 48°-0N. 170°-0E. (Pulkovo). De Bilt, Edinburgh, Ekaterinburg,
Pulkovo, Tiflis.
- July 8d. 9h. Four quakes between 9h. 33m. and 9h. 49m., but data insufficient.
- July 13d. 14h. 59m. 9°-4N. 122°-0E. (De Bilt). Batavia, Ekaterinburg, Kodai-
kanal, Manila, Osaka, Pulkovo, Tiflis, Zi-ka-wei.
- July 14d. 20h. 26m. 55s. 45°-5N. 15°-0E. (Shide); 45°-7N. 15°-0E. (De Bilt);
48°-8N. 13°-2E. (Granada); 46°-0N. 12°-0E. (Pulkovo).

- July 16d. 18h. 14m. 21s. 38°-5N. 140°-0E. (Shide); 40°-0N. 143°-5E. (Ottawa); 44°-0N. 153°-0E. (Pulkovo); 42°-8N. 148°-1E. (Tiflis).
- July 17d. 10h. 30m. 0° 70°-0W. (De Bilt); 0° 72°-0W. (Ottawa). La Paz, Pulkovo.
- July 27d. 11h. 52m. 29s. 4°-0N. 97°-0E. (Shide); 10°-0N. 104°-0E. (Pulkovo).
- July 28d. 17h. 37m. 10°-0N. 83°-7W. (Ottawa); 12°-0N. 88°-0W. (Pulkovo). Bidston, Coimbra, De Bilt, Ekaterinburg, Helwan, La Paz, Makeyevka, Moncalieri, Ottawa, Paris, Pulkovo, Rio Tinto, Tiflis, Toronto, Victoria (B.C.), Washington.
- July 29d. 5h. 21m. 39°-0N. 46°-0E. (Pulkovo). Ekaterinburg, Pulkovo, Tiflis.
- Aug. 3d. 1h. 30m. 2s. 4°-0S. 144°-5E. (Shide); 4°-4S. 145°-5E. (Granada); 3°-0S. 144°-7E. (Ottawa).
- Aug. 8d. 4h. 24m. 33s. 36°-0N. 139°-0E. (Shide); 37°-6N. 139°-5E. (Ekaterinburg); 37°-5N. 141°-4E. (Ottawa); 35°-0N. 138°-0E. (Pulkovo).
- Aug. 8d. 18h. 53m. 1s. 18°-5N. 120°-0E. (Shide); 19°-0N. 121°-0E. (De Bilt).
- Aug. 12d. 19h. 7m. 38°-6N. 40°-7E. (Ekaterinburg). Bidston, Ekaterinburg, Helwan, Irkutsk, Pulkovo.
- Aug. 14d. 23h. 35m. 12°-7N. 123°-5E. (De Bilt); 15°-0W. 126°-0E. (Pulkovo). Batavia, Ekaterinburg, Irkutsk, La Paz, Manila, Pulkovo, San Fernando.
- Aug. 15d. 7h. 30m. 43°-8N. 12°-9E. (De Bilt); 9h. 17m. 43°-0N. 12°-0E. (Pulkovo); 13h. 59m. 44°-0N. 12°-0E. (Pulkovo). Several quakes between 7h. 30m. to 21h. Barcelona, Bidston, Helwan, Irkutsk, Manila, Moncalieri, Monte Cassino, Padova, Paris, Pompeii, Pulkovo, Rocca di Papa.
- Aug. 16d. 7h. 6m. 15s. 44°-5N. 11°-5E. (Shide); 44°-5N. 11°-5E. (Pulkovo); 39°-6N. 14°-0E. (Tiflis). Quakes repeated until 16h.
- Aug. 21d. 14h. 32m. 29°-9N. 129°-3E. (Ekaterinburg). Batavia, Bidston, De Bilt, Edinburgh, Ekaterinburg, Helwan, Irkutsk, La Paz, Mizusawa, Osaka, Paris, Pulkovo, Rocca di Papa, San Fernando, Zi-ka-wei.
- Aug. 25d. 9h. 43m. 57s. 23°-0S. 66°-0W. (Oxford); 21°-4S. 74°-2W. (Granada); 22°-3S. 71°-6W. (Ottawa).
- Aug. 26d. 10h. 51m. 22°-0S. 71°-0W. (Ottawa). Coimbra, De Bilt, Edinburgh, Ekaterinburg, Granada, Helwan, Honolulu, Irkutsk, La Paz, Ottawa, Paris, Pulkovo, Rio Tinto, San Fernando, Tiflis, Zi-ka-wei.
- Aug. 27d. 22h. 42m. 29s. 37°-5N. 142°-5E. (Shide); 36°-4N. 139°-3E. (Ekaterinburg); 38°-0N. 141°-5E. (Ottawa).
- Aug. 28d. 6h. 39m. 29s. 30°-0N. 81°-0E. (Shide); 29°-3N. 79°-0E. (De Bilt); 37°-3N. 83°-4E. (Granada); 29°-9N. 80°-9E. (Irkutsk); 32°-0N. 82°-1E. (Ottawa); 32°-0N. 82°-0E. (Pulkovo); 28°-7N. 78°-0E. (Tiflis).
- Sept. 3d. 7h. 13m. 17s. 7°-0S. 155°-0E. (Shide); 6°-4S. 154°-8E. (Ekaterinburg); 8°-7S. 153°-2E. (Ottawa); 5°-0S. 152°-0E. (Pulkovo).
- Sept. 5d. 22h. 13m. 3°-0S. 152°-0E. (Pulkovo). Adelaide, Batavia, Berkeley, Bidston, De Bilt, Edinburgh, Ekaterinburg, Eskdalemuir, Helwan, Irkutsk, La Paz, Manila, Mauritius, Melbourne, Ottawa, Paris, Perth, Pulkovo, Rio Tinto, San Fernando, Sydney, Tiflis, Victoria (B.C.), Zi-ka-wei.
- Sept. 15d. 7h. 1m. 5s. 34°-5N. 138°-0E. (Shide); 32°-8N. 137°-1E. (Ekaterinburg); 33°-8N. 136°-6E. (Irkutsk); 37°-5N. 141°-4E. (Ottawa); 40°-0N. 152°-0E. (Pulkovo).
- Sept. 23d. 5h. 41m. 54s. 10°-0N. 97°-0W. (Shide); 10°-0N. 88°-2W. (Ottawa).
- Sept. 27d. 15h. 2m. 9s. 38°-5N. 22°-5E. (Shide); 39°-0N. 22°-0E. (Pulkovo).
- Sept. 29d. 18h. 54m. 46s. 10°-5S. 77°-0W. (Shide); 11°-0S. 78°-1W. (Ottawa).
- Oct. 3d. 1h. 26m. 13s. 14°-0S. 74°-5W. (Shide); 14°-7S. 77°-1W. (Ottawa); 13°-0S. 73°-0W. (Pulkovo).
- Oct. 3d. 13h. 31m. 18s. 55°-0N. 160°-0W. (Shide).
- Oct. 11d. 18h. 5m. 23s. 14°-0S. 174°-0W. (Shide).
- Oct. 14d. 19h. 47m. 15s. 30°-5N. 82°-0E. (Shide).
- Oct. 20d. 17h. 4m. 45s. 18°-0S. 173°-0W. (Oxford).
- Oct. 21d. 19h. 25m. 23s. 11°-0N. 94°-5E. (Shide).

- Oct. 26d. 3h. 16m. 15°-0N. 134°-0E. (Pulkovo). Batavia, Irkutsk, Manila, Mauritius, Melbourne, Mizusawa, Osaka, Perth (W.A.), Pulkovo, Zi-ka-wei.
- Oct. 26d. 5h. 42m. 49°-0N. 156°-0E. (Pulkovo). Batavia, Edinburgh, Honolulu, Irkutsk, Manila, Mizusawa, Osaka, Pulkovo, Zi-ka-wei.
- Oct. 26d. 18h. 20m. 13°-0N. 139°-7E. (De Bilt). Edinburgh, Manila, Melbourne, Mizusawa, Osaka, Pulkovo, Rio Tinto, San Fernando, Zi-ka-wei.
- Oct. 28d. 17h. 30m. 41°-4N. 42°-4E. (Ekaterinburg); 41°-0N. 46°-0E. (Pulkovo). Edinburgh, Ekaterinburg, Helwan, Irkutsk, Pulkovo.
- Oct. 30d. 1h. 50m. 8°-3S. 118°-0E. (Ekaterinburg). Batavia, Bidston, Ekaterinburg, Helwan, Irkutsk, Manila, Mauritius, Melbourne, Pulkovo, Zi-ka-wei.
- Oct. 30d. 23h. 55m. 40°-0N. 41°-3E. (Ekaterinburg). Ekaterinburg.
- Oct. 31d. 0h. 49m. 2°-1S. 115°-4E. (Ekaterinburg). Batavia, Colombo, Edinburgh, Ekaterinburg, Helwan, Irkutsk, Kodaikanal, Manila, Mauritius, Melbourne, Mizusawa, Pulkovo.
- Oct. 31d. 15h. 30m. 33s. 46°-5N. 160°-0E. (Shide); 46°-0N. 163°-0W. (Eskdalemuir); 51°-0N. 158°-5E. (Ottawa); 48°-0N. 154°-0E. (Pulkovo).
- Nov. 14d. 13h. 53m. 40°-5N. 43°-6E. (Pulkovo). Bidston, Eskdalemuir, Helwan, Irkutsk, Mizusawa, Moncalieri, Pulkovo, Rocca di Papa.
- Nov. 14d. 22h. 31m. 33s. 24°-0N. 121°-0E. (Shide); 30°-9N. 133°-5E. (Irkutsk); 25°-0N. 120°-0E. (Pulkovo).
- Nov. 15d. 23h. 38m. 44°-0N. 94°-0E. (Pulkovo). Helwan, Pulkovo.
- Nov. 21d. 6h. 25m. 24s. 18°-0N. 100°-0W. (Shide); 16°-1N. 94°-5W. (Ottawa); 11°-0N. 86°-0W. (Pulkovo).
- Nov. 24d. 4h. 2m. 38°-0N. 140°-0E. (Pulkovo). Bidston, Bombay, De Bilt, Helwan, Honolulu, Irkutsk, Kew, La Paz, Manila, Mizusawa, Osaka, Pulkovo, Rocca di Papa, Stonyhurst, Zi-ka-wei.
- Nov. 24d. 12h. 7m. 3°-0N. 21°-0W. (Pulkovo). Barcelona, Bidston, Capetown, Coimbra, De Bilt, Helwan, Irkutsk, Kew, La Paz, Moncalieri, Paris, Pulkovo, Rocca di Papa, San Fernando, Zi-ka-wei.
- Nov. 30d. 3h. 17m. 50s. 19°-0N. 70°-0W. (Shide); 19°-7N. 68°-8W. (Ottawa).
- Dec. 3d. 8h. 37m. 47°-0N. 104°-0E. (Pulkovo). Calcutta, Colombo, Ekaterinburg, Helwan, Irkutsk, Pulkovo.
- Dec. 6d. 22h. 17m. 5s. 87°-0N. 50°-0E. (Shide); 87°-0N. 30°-0E. (Pulkovo).
- Dec. 14d. 16h. 52m. 16s. 49°-0N. 174°-0E. (Shide); 50°-4N. 177°-1E. (Ekaterinburg); 55°-8N. 131°-0 (Irkutsk); 50°-0N. 178°-4E. (Ottawa); 48°-0N. 173°-0E. (Pulkovo).
- Dec. 23d. 9h. 24m. 11s. 24°-0S. 69°-0W. (Shide); 22°-3S. 63°-2W. (Ottawa).
- Dec. 24d. 7h. 53m. 6s. 30°-0N. 80°-0E. (Shide).
- Dec. 26d. 20h. 10m. 11s. 1°-0N. 143°-5E. (Shide).

APPENDIX II.

CONSTANTS FOR THE EPICENTRES.

If δ and λ be the latitude and longitude (East) of an epicentre, it is useful to have values of the following constants :

$$\begin{aligned} \mathbf{A} &= \cos \delta \cos \lambda & \mathbf{B} &= \cos \delta \sin \lambda & \mathbf{C} &= \sin \delta \\ \mathbf{D} &= \sin \lambda & \mathbf{E} &= -\cos \lambda & & \\ \mathbf{G} &= \sin \delta \cos \lambda & \mathbf{H} &= \sin \delta \sin \lambda & \mathbf{K} &= -\cos \delta \end{aligned}$$

With these constants it is easy to find the values of Δ , the distance of any station from the epicentre, and Z , the azimuth of the station from North round to E. For if d and l be the latitude and longitude (East) of the observing station, and if we put

$$a = \cos d \cos l, \quad b = \cos d \sin l, \quad c = \sin d,$$

the values of a , b , c being given after this Section, then (as shown in *Mon. Not. R.A.S. LXXV. p. 530*).

$$\begin{aligned} 2 \operatorname{versin} \Delta &= (a - \mathbf{A})^2 + (b - \mathbf{B})^2 + (c - \mathbf{C})^2 \\ 2 + 2 \sin \Delta \sin Z &= (a - \mathbf{D})^2 + (b - \mathbf{E})^2 + c^2 \\ 2 + 2 \sin \Delta \cos Z &= (a - \mathbf{G})^2 + (b - \mathbf{H})^2 + (c - \mathbf{K})^2 \end{aligned}$$

For finding Δ from the first equation a table is given at the end of the paper quoted. The azimuth is usually found from the second equation; but when Z is near 90° or 270° it is better to use the third.

The values of \mathbf{A} , \mathbf{B} , \mathbf{C} , &c., for the large earthquakes of 1916 are given below. It is a useful check to note that

$$\mathbf{A} = +\mathbf{KE}, \quad \mathbf{B} = -\mathbf{KD}, \quad \mathbf{G} = -\mathbf{CE}, \quad \mathbf{H} = +\mathbf{CD},$$

and there are other well-known relations such as

$$\mathbf{A}^2 + \mathbf{D}^2 + \mathbf{G}^2 = 1, \quad \&c.$$

CONSTANTS FOR LARGE EARTHQUAKES
IN 1916.

Date.	d. h.	A	B	C	D	E	G	H	K
Jan.	1 13	-895	+437	-096	+438	+899	+086	-042	-995
"	13 6	-731	+689	-035	+682	+731	+026	-024	-999
"	13 8	-713	+669	-044	+669	+743	+033	-029	-999
"	13 10	-719	+695	-044	+695	+719	+032	-031	-999
"	23 6	+603	+454	+656	+692	+799	+524	+395	-755
"	26 7	+630	+294	-719	+423	-906	+651	+304	-695
Feb.	1 7	-577	+652	+492	+749	+663	-326	+369	-870
"	6 10	-692	+301	+656	+399	+917	-602	+262	-755
"	6 21	-664	+017	+749	+026	+1-000	-749	+019	-664
"	14 10	-613	+785	-087	+788	+616	-054	+069	-996
"	15 11	-391	-274	+379	-574	+819	-720	-505	-477
"	20 17	-618	-120	+777	-191	+982	-763	-148	-629
"	27 20	-018	-983	+182	-1-000	+018	-003	-182	-983
March	12 3	+680	+195	-707	+276	-961	+679	+195	-707
"	18 0	-597	+433	+676	+588	+809	-547	+397	-737
"	25 23	-511	+757	+407	+829	+559	-228	+337	-914
April	7 9	+520	+703	-485	+804	-595	-289	-390	-875
"	15 12	-216	+975	-061	+976	+216	+013	-060	-998
"	18 4	-563	-109	+819	-191	+982	-804	-156	-574
"	21 11	-630	+538	+559	+649	+760	-425	+363	-829
"	21 13	+238	+734	+636	+951	-309	+197	+605	-772
"	24 4	+355	-879	+317	-927	-375	+119	-294	-948
"	24 8	+137	-975	+174	-990	-139	+024	-172	-985
"	26 2	+103	-981	+165	-995	-105	+017	-164	-986
May	9 14	+026	+999	+009	+1-000	-026	000	+009	-1-000
June	9 21	-613	+785	+087	+788	+616	-054	+069	-996
"	21 19	+185	+803	+566	+974	-225	+127	+551	-824
"	21 21	+521	-802	-292	-839	-545	-159	+245	-956
"	30 3	+139	-990	+009	-990	-139	+001	-009	-1-000
July	14 20	+677	+181	+713	+259	-966	+689	+185	-701
"	16 18	-649	+438	+622	+559	+829	-516	+348	-783
"	27 11	-122	+990	+070	+993	+122	-009	+070	-998
August	3 1	-812	+570	-070	+581	+814	-057	-041	-998
"	8 4	-611	+531	+588	+656	+755	-444	+386	-809
"	8 18	-474	+821	+317	+866	+600	-159	+275	-948
"	16 7	+699	+142	+701	+199	-980	+687	+159	-715
"	25 9	+375	-842	-391	-914	-407	-159	+355	-921
"	27 22	-630	+483	+609	+609	+793	-483	+371	-793
"	28 6	+136	+855	+500	+988	-156	+078	+494	-866
Sept.	3 7	-900	+420	-122	+423	+906	+111	-052	-993
"	15 7	-613	+531	+566	+669	+743	-421	+379	-824
"	23 5	-120	-978	+174	-993	+122	-021	-173	-985
"	27 15	+723	+299	+622	+383	-924	+576	+239	-783
"	29 18	+221	-958	-182	-974	-225	-041	+177	-983
Oct.	3 1	+259	-935	-242	-964	-267	-065	+233	-970
"	3 13	-539	-196	+819	-342	+940	-770	-280	-574
"	11 18	-965	-101	-242	-105	+995	+241	+025	-970
"	14 19	+120	+853	-508	+990	-139	+071	+503	-862
"	20 17	-944	-116	-309	-122	+993	+307	+038	-951
"	21 19	-077	+979	+191	+997	+079	-015	+190	-982
"	31 15	-647	+236	+725	+342	+940	-682	+248	-688
Nov.	14 22	-470	+783	+407	+857	+515	-210	+349	-914
"	21 6	-165	-937	+309	-985	+174	-054	-304	-951
"	30 3	+323	-889	+326	-940	-342	+111	-306	-946
Dec.	6 22	+033	+040	+999	+766	-643	+642	+765	-052
"	14 16	-652	+068	+755	+105	+995	-751	+079	-656
"	23 9	+327	-853	-407	-934	-358	-146	+380	-914
"	24 7	+150	+853	+500	+985	-174	+087	+493	-866
"	26 20	-804	+595	+018	+595	+804	-014	+011	-1-000

APPENDIX III.

CONSTANTS

FOR THE OBSERVING STATIONS.

	a	b	c
Aachen, 50°46'N., 6°5'E.,	+·629	+·067	+·774
Accra, 5°32'N., 0°12'W.,	+·995	-·003	+·096
Adelaide, 34°56'S., 138°35'E.,	-·763	+·542	-·573
Agram, (see Zagreb).			
Ascension, 7°57'S., 14°21'W.,	+·960	-·245	-·138
Athens, 37°58'N., 23°43'E.,	+·723	+·318	+·615
Azores, 37°44'N., 25°41'W.,	+·713	-·343	+·612
Baku, 40°23'N., 49°54'E.,	+·491	+·583	+·648
Baltimore, 39°18'N., 76°37'W.,	+·179	-·753	+·633
Barcelona, 41°25'N., 2°8'E.,	+·749	+·028	+·662
Batavia, 6°11'S., 106°47'E.,	-·287	-·952	-·108
Beirut, 33°54'N., 35°28'E.,	+·676	+·482	+·558
Berkeley, 37°52'N., 122°16'W.,	-·422	-·667	+·614
Berpnuda, 32°19'N., 64°51'W.,	+·359	-·765	+·535
Bidston, 53°24'N., 3°4'W.,	+·595	-·032	+·803
Bombay, 18°54'N., 72°48'E.,	+·280	+·904	+·324
Breslau, 51°4'N., 17°0'E.,	+·601	+·184	+·778
Budapest, 47°29'N., 19°4'E.,	+·639	+·221	+·737
Calcutta, 22°32'N., 88°20'E.,	+·027	+·923	+·383
Capetown, 33°56'S., 18°28'E.,	+·787	+·263	-·558
Cape Verde, 16°30'N., 24°0'W.,	+·876	-·390	+·284
Chacareta, 34°35'S., 58°28'W.,	+·431	-·702	-·568
Christchurch, 43°31'S., 172°37'E.,	-·719	+·093	-·689
Cocos, 12°12'S., 96°54'E.,	-·117	+·970	-·211
Columbra, 40°12'N., 8°26'W.,	+·756	-·112	+·646
Colombo, 6°54'N., 79°50'E.,	+·175	+·977	+·120
Cork, 51°53'N., 8°28'W.,	+·610	-·091	+·787
Czernowitz, 48°18'N., 25°56'E.,	+·598	+·291	+·747
De Bilt, 52°6'N., 5°11'E.,	+·612	+·055	+·789
Dyce (Aberdeen), 57°13'N., 2°10'W.,	+·541	-·020	+·841
Edinburgh, 55°55'N., 3°11'W.,	+·560	-·031	+·828
Ekaterinburg, 56°50'N., 60°38'E.,	+·268	+·477	+·837
Eskdalemuir, 55°19'N., 3°12'W.,	+·568	-·032	+·822
Fanning Is., 4°0'N., 159°40'W.,	-·935	-·347	+·070
Fernando, 3°50'S., 32°25'W.,	+·842	-·535	-·067
Fiji, 20°0'S., 178°0'E.,	-·939	+·033	-·342
Florence, 43°47'N., 11°15'E.,	+·708	+·141	+·692
Georgetown (see Washington).			
Göttingen, 51°32'N., 9°58'E.,	+·613	+·108	+·783
Graz, 47°5'N., 15°27'E.,	+·656	+·182	+·732
Granada, 37°11'N., 3°36'W.,	+·795	-·050	+·604
Guildford, 51°15'N., 0°35'W.,	+·626	-·006	+·780
Hamburg, 53°35'N., 9°59'E.,	+·585	+·103	+·805
Harvard Univ., 42°23'N., 71°7'W.,	+·239	-·699	+·674
Haselmer, 51°5'N., 0°43'W.,	+·628	-·008	+·778
Heidelberg, 49°24'N., 8°24'E.,	+·644	+·095	+·759
Helwan, 29°52'N., 31°20'E.,	+·741	+·451	+·498
Honolulu, 21°19'N., 158°4'W.,	-·864	-·348	+·364
Innsbruck, 47°16'N., 11°24'E.,	+·665	+·134	+·735
Irkutsk, 52°16'N., 104°19'E.,	-·151	+·593	+·791
Kew, 51°28'N., 0°19'W.,	+·623	-·003	+·782
Kodaikanal, 10°14'N., 77°27'E.†	+·214	+·961	+·178

	a	b	c
Konigsberg, 54°50'N., 20°30'E.,	+539	+202	+817
Ksara, 33°49'N., 35°52'E.,	+673	+487	+557
Laibach, 46°3'N., 14°31'E.,	+672	+174	+720
La Paz, 16°30'S., 68°9'W.,	+357	-890	-284
Lemberg, 49°50'N., 24°1'E.,	+589	+263	+764
Lick Observ., 37°20'N., 121°39'W.,	-417	-677	+607
Lima, 12°3'S., 77°3'W.,	+219	-953	-209
Limerick, 52°38'N., 8°41'W.,	+600	-092	+795
Manila, 14°35'N., 120°59'E.,	-498	+830	+252
Makeyevka, 48°2'N., 37°59'E.,	+527	+412	+744
Malta, 35°54'N., 14°31'E.,	+784	+203	+586
Mauritius, 20°6'S., 57°53'E.,	+499	+795	-344
Melbourne, 35°50'S., 144°58'E.,	-664	+465	-586
Mizusawa, 39°8'N., 141°7'E.,	-604	+487	+631
Moncalieri, 45°0'N., 7°42'E.,	+701	+095	+707
Monte Cassino, 41°29'N., 13°48'E.,	+728	+179	+662
Nagasaki, 32°44'N., 129°53'E.,	-539	+646	+541
Newport (see Shide).			
Osaka, 34°39'N., 135°26'E.,	-586	+577	+569
Oxford, 51°46'N., 1°15'W.,	+619	-014	+786
Ottawa, 45°24'N., 75°43'W.,	+173	-681	+712
Padova, 45°24'N., 11°52'E.,	+687	+144	+712
Paisley, 55°51'N., 4°26'W.,	+560	-043	+828
Paris, 48°50'N., 2°30'E.,	+658	+029	+753
Perth, W.A., 31°57'S., 115°50'E.,	-370	+764	-529
Pilar, 31°40'S., 63°51'W.,	+375	-764	-525
Pola, 44°52'N., 13°51'E.,	+688	+170	+705
Pompeii, 40°44'N., 14°30'E.,	+733	+190	+653
Port au Prince, 18°33'N., 72°20'W.,	+288	-903	+318
Pulkovo, 59°46'N., 30°19'E.,	+435	+254	+864
Rio Tinto, 37°46'N., 6°38'W.,	+785	-091	+612
Riverivew, 33°50'S., 151°10'E.,	-728	+401	-557
Rocca di Papa, 41°45'N., 12°43'E.,	+728	+164	+666
St. Helena, 15°55'S., 5°44'W.,	+957	-096	-274
St. Louis, 38°38'N., 90°14'W.,	-003	-781	+624
Samoa, 13°48'S., 171°46'W.,	-961	-139	-239
San Fernando, 36°28'N., 6°12'W.,	+800	-087	+594
Santa Clara, 37°26'N., 121°57'W.,	-420	-674	+608
Sarajevo, 43°52'N., 18°26'E.,	+684	+228	+693
Seychelles, 4°5'S., 55°5'E.,	+571	+818	-071
Shide, 50°41'N., 1°17'W.,	+633	-014	+774
Simla, 31°6'N., 77°11'E.,	+190	+835	+517
Stonyhurst, 53°51'N., 2°28'W.,	+589	-025	+808
Strasbourg, 48°35'N., 7°46'E.,	+656	+089	+750
Sydney, 33°52'S., 151°12'E.,	-728	+400	-557
Taihoku, 25°2'N., 121°31'E.,	-474	+781	+423
Tashkent, 41°19'N., 69°18'E.,	+266	+703	+660
Tiflis, 41°43'N., 44°48'E.,	+530	+526	+665
Tokio, 35°39'N., 139°45'E.,	-620	+525	+583
Toronto, 43°40'N., 79°23'W.,	+133	-711	+690
Tortosa, 40°49'N., 0°1'E.,	+757	-000	+654
Triest, 45°39'N., 13°46'E.,	+679	+166	+715
Trinidad, 10°40'N., 61°30'W.,	+469	-864	+185
Tsingtau, 36°4'N., 120°19'E.,	-408	+698	+589
Uccle, 50°48'N., 4°22'E.,	+630	+048	+775
Victoria, B.C., 48°24'N., 123°19'W.,	-365	-555	+748
Vienna, 48°15'N., 16°22'E.,	+639	+188	+746
Washington, 38°55'N., 77°4'W.,	+174	-758	+628
Wellington, 41°17'S., 174°48'E.,	-748	+068	-660
W. Bromwich, 52°32'N., 2°0'W.,	+608	-021	+794
Zagreb, 45°49'N., 15°59'E.,	+670	+192	+717
Zi-ka-wei, 31°12'N., 121°26'E.,	-446	+730	+518

TABLE.

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

SUPPLEMENT TO
“LARGE EARTHQUAKES OF 1916.”

The following records from Simla were received too late for inclusion in the published Volume. The opportunity was taken to refer cases of discrepancy back to the Observatory with the results noted below.

Date.	Δ	Az.	P.	O-C.	S.	O-C.
d. h. m. s.	°	°	h. m. s.	s.	h. m. s.	s.
Jan. 1 13 20 13	81.7	303	13 32 42	0	13 42 42	-14
13 6 18 16	65.7	306	6 29 12	+ 7	6 37 54	+ 5
13 8 20 25	66.8	306	8 31 24	+ 2	8 40 0	-12
24 6 55 7	33.6	90	7 1 42	-26	7 7 6	-35
26 7 37 53	42.6	92	7 45 54	-14	—	—
Feb. 1 7 36 22	46.5	285	7 45 6	0	7 51 30	-26
6 10 51 13	62.7	286	11 1 36	- 7	—	—
6 21 51 19	74.0	297	e 22 3 24	+23	e 22 12 30	- 3
14 10 1 31	54.3	303	e 10 18 30	? S	(10 18 30)	-14
15 11 35 52	81.4	320	e 11 58 18	? S	(11 58 18)	-13
20 17 47 35	79.4	304	e 18 9 48	? S	(18 9 48)	- 3
27 20 20 36	136.9	7	e 20 43 18	? PR ₁	21 7 18	?
Mar. 18 0 55 46	53.3	278	e 1 12 30	? S	(1 12 30)	-16
25 23 52 17	41.8	290	i 0 0 12	-14	—	—
April 7 9 26 3	64.2	20	i 9 36 54	+12	9 45 48	+30
15 12 31 32	42.2	324	12 39 42	- 2	12 46 12	+ 2
18 4 1 39	77.0	305	4 13 30	-10	4 23 6	-22
21 11 31 45	51.8	285	11 41 0	- 4	11 48 18	- 8
21 13 50 6	9.4	333	i 13 58 18	-10	—	—
24 8 2 8	134.3	19	8 24 0	—	8 48 12	—
26 2 21 14	135.6	22	e 3 23 36	? L	—	—
May 9 14 33 27	32.4	342	e 14 40 12	- 7	14 45 18	-23
June 9 21 23 59	54.3	305	e 21 40 42	? S	(21 40 42)	-30
21 19 56 9	3.3	360	e 19 57 36	+35	—	—
21 21 32 33	136.2	60	i 21 51 12	[-53]	—	—
30 3 0 6	142.7	27	e 3 41 12	? SR ₁	—	—
July 16 18 14 21	55.7	286	e 16 31 30	? S	(18 31 30)	-21
27 11 52 29	32.9	327	e 12 4 24	? S	(12 4 24)	-27
Aug. 3 1 30 2	73.0	304	i 1 41 24	-14	1 50 54	-10
8 18 53 1	40.6	297	i 19 6 42	? S	(19 6 42)	-34
25 9 43 57	146.4	59	e 10 17 6	? S	(10 17 6)	+90
27 22 42 29	53.3	283	i 22 59 6	? S	(22 59 6)	-23
28 6 39 29	3.5	287	i 6 40 24	0	6 40 54	-12
Sept. 3 7 13 17	83.3	302	i 7 36 24	? S	(7 36 24)	+ 7
15 7 1 5	50.4	295	7 10 18	+ 4	e 7 17 36	+ 7
23 5 41 54	138.5	319	e 6 56 54	? L	—	—
Oct. 3 1 26 13	148.9	40	e 1 49 18	? PR ₁	—	—
3 13 31 18	30.9	312	i 14 47 54	—	—	—
14 19 47 15	4.2	232	i 19 48 0	-20	—	—
20 17 4 46	115.8	295	e 17 34 6	? S	(17 34 6)	+65
21 19 25 23	25.7	322	19 30 42	-26	19 35 30	- 9
31 15 30 33	63.4	286	15 41 12	+ 5	15 53 54	? SR ₁

Simla Records continued overleaf.

SIMLA RECORDS, 1916—continued.

Date.				Δ	Az.	P.	O-C.	S.	O-C.
d.	h.	m.	s.	°	°	h. m. s.	s.	h. m. s.	s.
Nov.	14	22	31 33	39.2	290	e 22 44 48	? S	(22 44 48)	-39
	21	6	25 24	130.8	308	e 7 36 42	? L	—	—
	30	3	17 50	120.8	32	e 4 25 6	? L	—	—
Dec.	6	22	17 5	56.2	151	e 22 52 36	?	—	—
	14	16	52 16	71.1	292	i 17 13 0	? S	(17 13 0)	+5
	24	7	53 6	2.7	296	e 7 54 6	+18	—	—

On Jan. 26 the original reading for P was 7h. 47m. 6s.: on reference to the traces the reading 7h. 45m. 54s. was substituted. Dr. Walker writes: "The time of beginning is not quite definite and differs in our two records. But the earlier of the two, viz., 7h. 45m. 54s. of the 'A' record, should have been adopted by us."

On July 16 he writes: "The initial time should, I think, be 18h. 31m. 30s., though the vibrations during the succeeding 14 minutes are very faint indeed." This has accordingly been adopted above. The previous figures were 18h. 45m. 6s., which may apply to L.

Of Oct. 3 he writes: "The figures given for the record describe it as correctly as we can: there is not an error of one hour in the times given."

(Also received too late for inclusion.)

THE ZAGREB EARTHQUAKE RECORDS, 1916.

Date.	Δ	Az.	P.	O-C.	S.	O-C.
d. h. m. s.			h. m. s.	s.	h. m. s.	s.
Jan. 1 13 20 13	125.8	322	i 13 39 45	+203	e 13 51 8	+83
13 6 18 16	112.8	308	e 6 37 6	+220	i 6 47 30	+82
13 8 20 25 N.W.	113.7	322	e 8 39 31	+231	i 8 49 55	—
N.E.			8 40 22	+232	i 8 49 47	+82
13 10 50 45 N.W.	112.3	320	e 11 7	+67	—	—
24 6 55 7	15.9	293	i 6 59 3	+5	i 7 2 24	+24
26 7 37 53	6.3	270	i 7 39 31	+2	i 7 40 50	+5
Feb. 1 7 36 22	84.8	317	i 7 49 11	+2	—	—
N.E.					i 7 59 33	-6
6 10 51 13	86.3	338	e 11 4 10	+2	—	—
6 21 51 19	84.6	348	e 22 4 8	+3	e 22 14 0	-34
14 10 1 31	101.4	319	e 10 15 24	-44	i 10 26 8	-94
15 11 35 52	71.6	14	i 11 47 33	+14	—	—
N.E.					e 11 56 44	+7
20 17 47 35 N.E.	83.1	354	e 17 59 57	-15	18 10 34	—
N.W.			18 0 3		i 18 10 25	-15
27 20 20 36 N.E.	94.0	36	e 20 34 14	0	i 20 45 11	-21
Mar. 12 3 23 52 N.E.	0.8	320	e 3 24 15	+11	3 24 29	+25
18 0 55 46	80.4	322	e 1 8 9	+2	1 18 9	-5
25 23 52 17 N.E.	84.5	316	0 4 54	-8	—	—
					e 0 15 20	-11
April 7 9 26 3 N.W.	82.2	309	e 9 38 35	+1	—	—
N.E.					e 9 48 55	+4
15 12 31 32 N.W.	90.1	315	i 12 44 50	0	12 55 20	-27
					i 12 55 37	-10
18 4 1 39	79.1	354	4 13 50	-3	—	—
N.W.					i 4 23 55	+3
21 11 31 45 N.E.	85.3	322	e 11 44 22	-13	i 11 54 36	-31
21 13 56 6	40.8	298	i 14 3 52	-15	14 9 53	-31
24 4 26 28	72.7	42	4 38 10	+8	—	—
N.W.					4 47 20	-6
24 8 2 8	88.3	38	i 8 15 7	-7	—	—
N.W.					8 25 37	-26
May 9 14 33 27	77.5	319	—	—	14 55 24	+2
June 9 21 23 59	101.4	319	21 38 6	-10	21 49 2	-66
21 19 56 9	46.8	305	e 20 4 54	-1	—	—
21 21 32 33 N.W.	90.8	38	i 21 45 5	-48	—	—
N.E.					e 21 55 1	-114
30 3 0 6 N.E.	95.2	36	e 3 13 41	-9	e 3 24 25	-49
July 14 20 26 55	0.8	35	i 20 27 21.7	+15	i 20 27 36	+18
16 18 14 21	84.5	328	e 18 27 4	-2	i 18 37 26	-9
27 11 52 29 N.W.	80.9	315	i 12 4 50	-3	—	—
					12 14 50	-13
Aug. 3 1 30 2 N.E.	118.6	321	e 1 48 55	+197	—	—
8 4 24 33	83.4	322	e 4 37 6	-5	i 2 1 58 18	-23
8 18 53 1	86.1	317	i 19 5 53	-2	e 4 47 27	-7
16 7 6 15	3.4	232	e 7 7 46	-2	i 19 16 30	-2
25 9 43 57	101.1	40	9 58 23	+10	—	—
N.E.					e 10 8 59	-64
27 22 42 29 N.E.	83.9	323	i 22 55 0	-10	—	—
N.E.					i 23 5 17	-19
28 6 39 29	52.1	305	e 6 48 50	0	6 56 15	+1
Sept. 3 7 13 17 N.E.	127.5	319	7 32 36	[+ 7]	e 6 46 ?	+179
15 7 1 5 N.W.	84.2	325	e 7 13 49	+1	—	—
23 5 41 54	98.5	34	—	—	i 7 24 2	-13
					e 2 6 5	-155

Zagreb Records continued overleaf.

(Also received too late for inclusion.)

THE UCCLE EARTHQUAKE RECORDS, 1916.

Date.	Δ	Az.	P.	O-C.	S.	O-C.
d. h. m. s.	^	^	h. m. s.	s.	h. m. s.	s.
Jan. 1 13 20 13	128.1	332	13 39 47	[+20]	i 13 49 11	-50
13 6 18 16	117.4	321	e 6 38 36	?PR ₁	e 6 55 0	?SR ₁
13 8 20 25	118.1	329	e 8 39 51	?PR ₁	e 8 50 36	+96
24 6 55 7	24.5	306	i 7 0 40	0	e 7 5 3	+2
26 7 37 53	14.5	294	i 7 41 23	+3	i 7 44 25	-12
Feb. 1 7 36 22	87.2	329	e 7 49 17	-5	e 7 59 49	-16
6 21 51 19	80.7	355	e 22 3 36	-6	e 22 13 54	+4
15 11 35 52	65.0	20	e 11 46 45	+8	e 11 55 42	+25
20 17 47 35	78.1	4	e 17 59 35	-8	e 18 9 30	-6
27 20 20 36	85.2	33	e 20 33 28	+3	e 20 43 54	-3
Mar. 12 3 23 52	9.7	309	e 3 26 11	-7	3 28 19	+6
18 0 55 46	80.3	336	e 1 8 7	0	e 1 18 6	-7
25 23 52 17	88.3	324	e 0 5 (14)	(-9)	—	—
April 7 9 26 3	90.8	314	e 9 39 20	-3	e 9 49 54	-31
15 12 31 32	97.9	320	—	—	e 12 56 40	-27
18 4 1 39	74.0	3	e 4 13 19	-2	i 4 22 54	+1
21 11 31 45	86.4	330	i 11 44 31	-9	e 11 54 47	-32
21 13 56 6	47.3	306	14 4 43	-12	14 11 30	-21
24 4 26 28	64.7	37	e 4 37 11	0	4 45 49	0
24 8 2 8	79.9	34	i 8 14 22	-4	8 24 35	+5
26 2 21 14	81.6	34	e 2 33 43	+1	2 43 50	-6
May 9 14 33 27	85.9	321	—	—	e 14 57 0	+4
June 9 21 23 59	106.3	328	—	—	e 21 49 0	-114
21 21 32 33	86.4	38	21 45 14	-14	—	—
30 3 0 6	87.3	42	i 3 13 7	0	e 3 23 30	-20
July 14 20 26 55	8.8	311	e 20 29 (16)	(+8)	e 20 31 42	+48
16 18 14 21	84.6	338	e 18 27 8	-1	e 18 37 12	-24
27 11 52 29	88.1	320	e 12 5 26	-9	e 12 16 0	-22
Aug. 3 1 30 2	122.2	334	e 1 49 (0)	[0]	e 2 0 (42)	(+94)
8 4 24 33	84.5	335	e 4 37 10	-8	e 4 47 48	+1
16 7 6 15	7.9	320	Record lost	—	—	—
25 9 43 57	96.2	30	e 9 57 49	+2	e 10 8 0	-75
27 22 42 29	84.4	329	e 22 55 0	-13	e 23 5 18	-28
28 6 39 29	59.0	312	i 6 49 39	+5	i 6 57 47	+7
Sept. 3 7 13 17	129.9	334	e 7 36 1	?PR ₁	—	—
15 7 1 5	85.5	331	e 7 13 48	-8	i 7 24 8	-22
23 5 41 54	89.3	27	—	—	e 6 6 0	0
27 15 2 9	17.7	322	15 6 27	+5	e 15 9 48	+6
Oct. 3 1 26 13	94.0	33	e 1 39 30	-21	e 1 50 12	-57
11 18 5 23	143.2	3	e 18 25 3	(-5)	—	—
20 17 4 45	147.1	5	i 17 24 27	(-9)	—	—
31 15 30 33	80.4	342	15 42 48	-6	e 15 52 42	-19
Nov. 14 22 31 33	86.7	323	e 22 44 20	-10	—	—
21 6 25 24	84.8	33	6 38 13	+2	6 48 34	-7
30 3 17 50	65.6	41	3 28 40	+1	—	—
Dec. 14 16 52 16	79.7	350	17 4 30	-3	e 17 14 30	-6