

Manila Observatory - Philippine Islands.

Seismological Bulletin, No. 1, a.

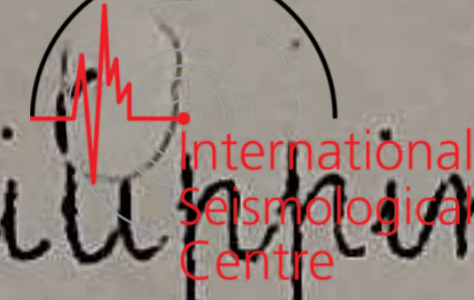
Time of the 120th meridian E. of Greenwich.
Midnight = 0^h.

January, 1910.

North latitude = 14° 34' 41"
East longitude = 120° 58' 33"

No.	Date	Charac- ter.	Instru- ment and Component	Beginning			Maximum range of motion.			End.	Remarks.
				First preliminary tremors	Second preliminary tremors	Principal portion.	Hour.	Amplitude (2a). mm.	Period s.		
1	1	I	V	19 20 50						21 03	
			H { NNW	19 20 54						20 52	
			H { WSW	19 20 54						20 48	
2	1	I _d	V	22 31 05		22 31 21	22 31 24	.14	2.2	22 35	Vertical Component 0.09 mm.
3	4	I _d	V	13 24 22		13 24 38	13 25 14	.75	2.4	13 31	V. C. 0.28 mm.
			H { NNW	13 24 24		13 24 40				13 29	
			H { WSW	13 24 24		13 24 39				13 29	
4	7	I	V	3 58 20			4 02 07	.11	9.6	4 22	
			H { NNW	3 58 21			4 02 11	.21	9.9	4 25	
			H { WSW	3 58 21							
5	8	II	V	22 54 02	22 57 40	23 00 43	23 03 55	.01	9.8	23 40	Earthquake in Shanghai.
			H { NNW	22 54 02	22 57 52	23 00 41	23 03 23	.02	7.8	23 36	
			H { WSW	22 54 02	22 57 28	23 00 34	23 03 37	.05	13.5	23 37	
6	9	I _v	V	13 54 36		13 55 46	13 56 37	.10	2.6	14 10	V. C. 0.01 mm.
			H { NNW	13 54 45		13 55 54	13 56 26	.03	5.1	14 07	
			H { WSW	13 54 45		13 56 11	13 56 28	.05	4.8	14 10	
7	9	I _d	V	15 26 18		15 26 33	15 26 51	.02	2.4	15 28	V. C. 0.01 mm.

Manila Observatory - Philippine Islands.



January, 1910.

Seismological Bulletin, No. 1, b.

No.	Date	Char-acter.	Instru-ment and Component	Beginning			Maximum range of motion			Remarks.			
				First preliminary tremors.	Second preliminary tremors.	Principal portion	Hour.	Amplitude (2a).	Period		End.		
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.			
8	10	I _v	V.	6 39 41		6 40 04	6 40 40	.04	2.4	6 48			
	10	At 22 ^h 38 ^m Earthquake, II at Tacloban (NE of Leyte).											
9	11	I _v	V.	11 43 05		11 43 34	11 43 53	.26	2.4	11 50	V.C. 0.01 mm. Egke., III at Romblon Island.		
10	12	I _d	V.	8 26 03		8 26 18	8 26 21	.14	2.4	8 31	V.C. 0.02 mm.		
	12	At 11 ^h 16 ^m Egke., III at Butuan (N of Mindanao).											
11	13	I _d	V.	1 43 52		1 44 11	1 44 15	.26	2.4	1 49	V.C. 0.02 mm.		
12	13	I	H. WSW	8 29 21						8 41			
13	15	I _d	V.	16 33 17		16 33 36	16 33 39	1.08	2	16 40	V.C. 0.55 mm. Egke., I at Baguio (W Luzon).		
			V.	6 21 44		6 23 43	6 23 54	.23	2.4	7 35	V.C. 0.03 mm. Egke., IV Agusan River Valley.		
14	16	I _v	H.	NNW	6 21 45		6 23 43	6 23 49	.67	11.7	7 22		
				WSW	6 21 45		6 23 44	6 26 04	.92	12	7 22		
	16	At 10 ^h 07 ^m Egke., III at Cotabato (Mindanao).											
	16	At 11 ^h 14 ^m 46 ^s Egke., III Agusan River Valley.											
	20	At 17 ^h 50 ^m Egke., III at Butuan (N of Mindanao).											
15	21	I	V.	1 30 00						2 03			
			H. WSW	1 30 08							2 00		
16	21	I	V.	8 58 58		8 59 08	8 59 21	.02	2.4	9 03			
			V.	17 09 12?	17 22 16?	17 34 57?	17 48 06?	.01	13.8	18 13			
17	22	II _u	H.	NNW	17 09 13?	17 22 32?	17 36 01?	17 48 47?	.04	14.4	18 21		
				WSW	17 09 13?	17 22 17?	17 35 20?	17 52 16?	.01	15	18 21		
18	24	I _d	V.	11 28 32		11 28 52	11 28 57	.14	2.4	11 31	V.C. 0.02 mm.		

Manila Observatory. — Philippine Islands.



Seismological Bulletin, No. 1, c.

January, 1910.

No.	Date	Char-acter.	Instru-ment and Component.	Beginning.			Maximum range of motion.			End.	Remarks.	
				First preliminary tremors.	Second preliminary tremors.	Principal portion	Hour.	Amplitude (2a).	Period.			
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.		
19	30	I _r	V.	11 57 07		12 06 24	12 07 29	02	6.4	12 54		
			H.	NNW	11 57 09		12 07 00	12 07 34	.05	5.7	12 48	
				WSW	11 57 09		12 06 36	12 07 24	.14	8.4	12 48	
20	31	I	V.	0 48 17						1 17		
			H.	NNW	0 48 30						1 06	
				WSW	0 48 30						1 09	

Instrumental constants. — Vicentini microseismograph (V.): Length of the pendulum, 1.50 meters; weight of the bob, 100 kilograms; period of simple oscillation, 1.2 seconds. Magnification of the record, 50 times.

Horizontal Pendulums (H.): Vertical distance between the point of suspension and the point of support, 1.05 meters; horizontal distance between the point of support and the center of the heavy bob, 0.77 meter; weight, 20 kilograms; period of oscillation: NNW-SSE pendulum, $T=13.8$ seconds; WSW-ENE pendulum, $T=11.4$ seconds. Magnification of the record: NNW-SSE, 15 times; WSW-ENE, 15 times. — These seismographs have no damping arrangement.

Foundation and location. — The instruments are mounted against a solid cut-stone pier measuring 5 by 5 meters at its base and 3.30 by 3.30 at the top, with a foundation about 4 meters deep, and insulated from the surrounding walls of the building by a space, 2 meters wide, filled with sand. The Vicentini microseismograph stands at a height of 9.5 meters above the ground and 10.5 above the sea level, while the horizontal pendulums stand at 1.50 meters above the ground and 2.50 above the sea level.

Geological structure. — The geological formation of the ground is alluvium and beach sand to a depth of some 14 meters which extends many kilometers toward north and south and only 4 to the east, where volcanic tuff outcrops. To the west there lies the Manila Bay at a distance of some 300 meters. The alluvial plain of Manila is crossed by creeks in many directions and by the Pasig River, which flows in an E-W direction, at a distance of 1.5 kilometers to the north of the Observatory.

M. S. Masco

Manila Observatory - Philippine Islands.

February, 1910. Seismological Bulletin, No. 2, a.

No.	Date	Character	Instrument and Component	Beginning			Maximum range of motion.			End.	Remarks.		
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a)	Period.				
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.			h. m.	
21	4	At 10 ^h 34 ^m 30 ^s <i>Eqke.</i> , III at Butuan (N of Mindanao).	V.	22 10 27			22 19 12	0.01	7.6	22 42			
			I _r	H	NNW	22 10 25			22 19 08	.11	7.8	22 41	
					WSW	22 10 24			22 19 46	.04	7.2	22 43	
22	6	At 8 ^h 20 ^m 5 ^s <i>Eqke.</i> , II at Cotabato (S of Mindanao).	V.	22 10 20		22 10 37	.03	2.4	22 13	Vertical Comp. 0.01 mm.			
23	7	<i>Eqke.</i> , III at Calapan (Mindoro S.)	V.	23 41 08		23 41 22	.18	2.4	23 45	V.C. 0.07 mm.			
24	8	<i>Eqke.</i> , III at Catbalogan (W of Samar).	V.	0 02 18		0 03 19	.03	2.4	0 07	V.C. 0.01 mm.			
25	8	<i>Eqke.</i> , IV in northern Luzon.	V.	16 24 33		16 25 18	1.60	2.4	16 40	V.C. 0.05 mm.			
26	8	II _r	H	NNW	16 24 48		16 25 31	.20	9	16 40			
				WSW	16 24 48		16 25 32	.22	8.1	16 40			
27	9	<i>Eqke.</i> , III at Nueva Caceres and Virac.	V.	7 20 30		7 21 16	.06	2.4	7 26	V.C. 0.04 mm.			
28	10	I _v	H	V.	16 00 25		16 05 16	.04	2.4	16 16			
				NNW	16 00 26		16 05 00	.03	9.9	16 22			
				WSW	16 00 26		16 05 01	.02	5.4	16 20			
29	12	<i>Eqke.</i> , III at Nueva Caceres and Virac.	V.		15 55 36		15 55 38	.04	2.4	15 58	V.C. 0.01 mm.		
30	13	II _r	H	V.	2 14 58		2 23 50	.07	6.4	3 20	V.C. 0.01 mm.		
				NNW	2 15 03		2 24 28	1.68	12	3 21			
				WSW	2 15 03		2 23 57	2.25	12	3 22			

Manila Observatory. — Philippine Islands.

February, 1910: Seismological Bulletin, No. 2, b.

No.	Date.	Char-acter.	Instru-ment and Component	Beginning.			Maximum range of motion.			End.	Remarks.	
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a.)	Period.			
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.			h. m.
31	15	II _v	V.	18 21 01		18 21 38	18 22 15	2.23	2.4	18 54	V. C. 0.68 mm.	
			H.	NNW	18 21 03		18 21 39	18 22 59	1.01	10.2		18 50
				WSW	18 21 03		18 21 38	18 23 25	2.47	11.4		18 50
32	16	I _v	V.	13 37 07		13 37 27	13 37 29	.09	2	13 41	V. C. 0.02 mm.	
33	18	I _r	V.	13 21 57						13 38		
34	22	I _r	V.	16 12 20						16 26		
			H.	WSW	16 12 26						16 28	
35	23	I _v	V.	5 43 13		5 43 28	5 44 07	.40	2.4	5 47	V. C. 0.21 mm.	
			H.	NNW	5 43 16		5 43 30				5 47	
36	25	I _d	V.	21 17 44		21 18 06	21 18 21	.04	2.4	21 21	V. C. 0.01 mm.	
			V.	22 29 44	22 32 27	22 35 10	22 36 14	.05	10.4	23 23	V. C. 0.01 mm.	
37	27	II _r	H.	NNW	22 29 46	22 32 15	22 35 24	22 36 15	1.56	12	23 18	
				WSW	22 29 46	22 32 17	22 34 56	22 35 45	2.73	10.8	23 26	

M. S. Maso

Manila Observatory. - Philippine Islands.

March, 1910. Seismological Bulletin, No. 3, a.

No.	Date.	Char-acter.	Instrument and Component.	Beginning.			Maximum range of motion.			End.	Remarks.	
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a).	Period.			
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.		
38	4	I _d	V.			18 04 16	18 04 19	0.02	2	18 06	Vertical Component 0.01 mm.	
39	5	I _d	V.			16 48 28	16 48 30	.05	1.8	16 51		
6 At 3 ^h 30 ^m Earthquake, intensity III at Sumay (Guam I.)												
6 At 15 ^h 14 ^m 20 ^s Eqke., III at Butuan (N of Mindanao).												
40	7	I _v	V.	15 31 47		15 32 29	15 32 46	.38	2.4	15 42	V. C. 0.09 mm. Eqke., IV at Baguio (W of Luzon).	
			H.	NNW	15 31 56		15 32 39	15 33 56	.11	9.3		15 42
				WSW	15 31 56		15 32 40					15 42
41	8	II _v	V.	9 45 04		9 45 24	9 45 41	.49	2.4	9 54	V. C. 0.24 mm. Eqke., III at Iba (W of Luzon).	
			H. WSW	9 45 06		9 45 25				9 55		
42	10	I	V.	21 21 04		21 21 21	21 21 52	.10	2.4	21 25	V. C. 0.07 mm.	
			H.	NNW	21 21 04		21 21 22					21 25
				WSW	21 21 04		21 21 21					21 25
11 At 1 ^h 07 ^m Eqke., IV in the Surigao peninsula. Repeated at 2 ^h 30 ^m with intensity III.												
16 At 8 ^h 40 ^m Eqke., III at Santa Cruz, Laguna Province (Luzon I.)												
43	20	II _v	V.	20 38 21		20 38 36	20 38 50	.88	2.4	20 47	V. C. 0.58 mm. Eqke., III at Balanga (SW of Luzon).	
			H.	NNW	20 38 21		20 38 36					20 47
				WSW	20 38 21		20 38 36					20 47
44	20	I _v	V.	22 04 32						22 08	V. C. 0.01 mm. Eqke., III at Legaspi (SE of Luzon).	

Manila Observatory. - Philippine Islands.

March, 1910. Seismological Bulletin, No. 3, t.

No.	Date	Char-acter	Instru-ment and Component	Beginning.			Maximum range of motion.			End.	Remarks.	
				First preliminary tremors.	Second preliminary tremors.	Principal portion	Hour.	Amplitude (2a.)	Period.			
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.		
45	25	I_v	H. { NNW WSW	14 41 30 14 41 30		14 41 51 14 41 51				14 47 14 47	V.C. 0.50 mm.	
46	26	I_v	V.	2 39 52		2 41 37	2 42 00	.04	2.4	2 50		
47	26	I_v	V.	3 18 05						3 21	V.C. 0.08 mm. Eqke., V at Baguio (W of Luzon).	
	26	At 4 ^h 08 ^m Eqke., III at Baguio (W of Luzon).										
	26	At 4 ^h 24 ^m Eqke., IV at Baguio (W of Luzon).										
48	26	I_v	V.	6 09 30		6 09 40	6 09 45	.13	2.4	6 14	V.C. 0.08 mm.	
49	26	I_d	V.	8 52 09		8 52 17	8 52 55	.07	2.4	8 55	V.C. 0.03 mm.	
50	26	I_v	V.	9 17 16		9 17 26	9 18 04	.80	2.4	9 22	V.C. 0.37 mm.	
51	26	I_d	V.	9 32 31		9 32 35	9 33 11	.02	2.4	9 36	V.C. 0.01 mm.	
52	26	I_v	V.	19 55 00		19 55 17	19 55 57	.29	2.4	20 03	V.C. 0.11 mm.	
53	27	I_v	V.	0 37 10		0 37 25	0 37 58	.11	2.4	0 41	V.C. 0.04 mm.	
54	27	I_v	V.	0 45 30		0 45 45	0 46 26	1.76	2.2	0 57	V.C. 0.51 mm. Eqke., IV at Lambales Range.	
			V.	1 05 54	1 10 16	1 14 04	1 16 06	.01	11.2	2 04		
55	31	I_v	H. { NNW WSW	1 05 57 1 05 57	1 10 16 1 10 14	1 14 18 1 14 18	1 16 06 1 16 29	.07 .03	10.1 9	2 05 2 05		
56	31	I_v	V.	12 42 47		12 43 06	12 43 10	.19	2.4	12 48	V.C. 0.07 mm.	
57	31	I_d	V.	21 25 35		21 25 42	21 25 48	.07	2.4	21 29	V.C. 0.01 mm.	

M. S. Maso

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 4, a.

April, 1910.

No.	Date	Char-acter.	Instru-ment and Component	Beginning.			Maximum range of motion.			End.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a).	Period		
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.		
58	1	II _r	V.	21 53 54			21 59 21?	0.02	6.4	22 26	
			H. NNW	21 53 57			21 58 51?	.80	12.6	22 24	
			H. WSW	21 53 57			21 59 20?	.31	12.6	22 24	
59	2	I _d	V.	14 24 03		14 24 24	14 24 28	.08	2.4	14 27	Vertical Component 0.01 mm.
	2		At 17 ^h 09 ^m 20 ^s Earthquake, V at Butuan (N of Mindanao). Repeated at 17 ^h 30 ^m with intensity III.								
	5		At 2 ^h 20 ^m Eqke., III at Butuan (N of Mindanao). Repeated at 2 ^h 45 ^m with the same intensity.								
60	6	I _d	V.	4 50 13		4 50 32	4 50 45	.05	2.2	4 53	V. C. 0.01 mm.
61	10	I _d	V.	9 12 14		9 12 43	9 12 48	.22	2.4	9 18	V. C. 0.05 mm.
62	12	III _v	V.	8 24 38		8 26 42	8 27 23	1.88	2	10 10	V. C. 0.24 mm. Slight shocks at
			H. NNW	8 24 38		8 26 41				10 10	Aparri (NE of Luxon): Vague reports
			H. WSW	8 24 38		8 26 41				10 10	of an earthquake in northern Formosa.
63	12	I _d	V.	18 38 28		18 38 41	18 39 09	.14	2.4	18 42	V. C. 0.03 mm.
	12		At 23 ^h 53 ^m Eqke., III at Laoag (NW of Luxon).								
	16		At 17 ^h 25 ^m Eqke., II at Baguio (central Luxon).								
64	16	II _r	V.	20 34 56	20 39 06	20 44 28	20 45 06	.02	8	21 20	V. C. 0.01 mm.
			H. NNW	20 34 56	20 39 06	20 44 24	20 45 40	.20	9.6	21 21	
			H. WSW	20 34 56	20 39 07	20 44 31	20 45 24	.41	10.2	21 22	
65	17	I _d	V.	0 37 53		0 38 00	0 38 02	.02	2	0 41	
66	18	I _d	V.	13 01 02		13 01 26	13 01 41	.04	2	13 04	V. C. 0.01 mm.

Manila Observatory. - Philippine Islands.

April, 1910. Seismological Bulletin, No. 4, b.

No.	Date.	Char-acter.	Instru-ment and Component.	Beginning.			Maximum range of motion.			End.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a.)	Period.		
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.	
67	19	I _v	V.	3 30 13		3 30 32	3 30 33	.06	2.2	3 33	V.C. 0.02 mm. Eche., III at Vigan. (NW of Luzon).
68	19	I _d	V.	22 17 43		22 18 03	22 18 34	.01	2.2	22 20	
69	20	I _v	V.	9 51 27		9 51 56	9 51 59	.08	2.4	9 56	
70	21	I _r	V.	6 32 41		6 41 26?	6 42 00	.02	6.8	7 09	
			H. NNW	6 32 45		6 41 32?	6 42 49	.18	9	7 12	
			H. WSW	6 32 45		6 41 31?	6 42 39	.13	8.7	7 12	
71	21	I _d	V.	15 23 25		15 25 51	15 26 07	.04	2.4	15 28	V.C. 0.01 mm.
72	22	I _d	V.	2 00 45		2 00 55	2 00 59	.06	2.	2 04	V.C. 0.02 mm.
73	29	I _d	V.	9 38 45		9 39 09	9 39 28	.03	2.4	9 44	V.C. 0.06 mm.
74	29	I _d	V.	11 14 21		11 14 42	11 14 44	.04	2	11 18	

M. S. Maso

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 5, a.



International
Seismological
Centre

May, 1910.

No.	Date	Char-acter.	Instru-ment and Component	Beginning									Maximum range of motion			Remarks.				
				First preliminary tremors.			Second preliminary tremors.			Principal portion.			Hour.	Amplitude (2a).	Perod.		End.			
				h.	m.	s.	h.	m.	s.	h.	m.	s.						h.	m.	
75	2	I _r	V.	2	40	56	2	44	55	2	48	46	2	49	34	0.02	6.8	3	15	Earthquake in New Guinea.
			H. NNW	2	40	56	2	44	58	2	48	48	2	49	38	.27	13.5	3	16	
			H. WSW	2	40	56	2	44	55	2	48	47	2	49	39	.21	9	3	16	
76	4	I	H. NNW	7	55	31			7	59	37	8	02	26	.15	10.8	8	21		
77	6	I _d	V.	14	12	10			14	12	32	14	12	14	.60	9.4	14	27	Vertical Component 0.52 mm.	
			H. WSW	14	12	13			14	12	36	14	13	25	.10	6.6	14	23		
78	10	I _v	V.	17	36	29												17	52	
			H. NNW	17	36	29			17	40	19	17	41	15	.12	10.2	17	55		
			H. WSW	17	36	29													17	55
79	10	I _v	V.	22	32	56												22	52	Earthquake, IV, NE part of Mindanao.
			H. NNW	22	32	56			22	34	48	22	35	03	.05	7.2	22	53		
			H. WSW	22	32	56			22	34	45	22	35	13	.04	6.9	22	53		
80	10	II _v	V.	23	07	42			23	10	09	23	10	38	.06	2.4	23	48	Eqke., IV, E. of the NE part of Mindanao.	
			H. NNW	23	07	42			23	10	15	23	12	03	2.13	12.	23	52		
			H. WSW	23	07	42			23	10	12	23	12	04	1.44	11.4	23	52		
81	11	I _v	V.	0	18	27			0	20	42	0	24	07	.03	5.2	0	58	Eqke., III at Butuan Bay.	
			H. NNW	0	18	27			0	20	28	0	22	40	1.30	12	0	58		
			H. WSW	0	18	27			0	20	36	0	22	35	1.05	10.2	0	58		
82	11	I _v	H. NNW	1	24	36			1	26	52	1	27	46	.12	7.8	1	43	Eqke., V, E. of the NE part of Mindanao.	
83	12	I _d	V.	14	26	06			14	26	27	14	26	35	.39	2.4	14	30	V. C. 0.16 mm.	

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 5, b. May, 1910.



No.	Date.	Char-acter.	Instru-ment and Component.	Beginning.			Maximum range of motion.			End.	Remarks.									
				First preliminary tremors.			Second preliminary tremors.					Hours.	Amplitude (2 σ)	Period						
				h.	m.	s.	h.	m.	s.						h.	m.	s.	h.	m.	
84	13	I _r	H. NNW	16	08	44	16	18	40	16	21	25	.31	12	17	08				
			H. WSW	16	08	44	16	18	48	16	21	45	.07	9	17	05				
85	16	I _r	H. NNW	0	09	57									0	30				
			H. WSW	0	09	57										0		30		
86	18	I _v	V.	5	45	50	5	46	15	5	46	22	.03	2.4	5	49	V.C. 0.01 mm. Eqke. III at Uigan (NW of Luzon). Eqke., IV at Butuan Bay.			
			V.	12	04	13	12	07	18	12	07	43	.02	2.4	12	28				
87	20	I _v	H. NNW	12	04	16	12	07	18	12	07	40	.20	10.2	12	24				
			H. WSW	12	04	16	12	07	24	12	07	39	.23	8.7	12	29				
			V.	14	31	20	14	36	34	14	41	25	14	44	08	.01		14.8	15	28
88	22	I _r	H. NNW	14	31	25	14	37	23	14	41	30	14	46	02	.25	12.3	15	21	
			H. WSW	14	31	25	14	36	41	14	41	30	14	45	17	.07	12	15	21	
23	At 13 ^h 01 ^m Eqke., III at Butuan (N of Mindanao).																			
23	At 17 ^h 50 ^m 15 ^s Eqke., II at Ormoc (W of Leyte).																			
23	At 18 ^h 48 ^m 20 ^s Eqke., II at Ormoc (W of Leyte).																			
24	At 19 ^h 43 ^m 02 ^s Eqke., III at Laoag (NW of Luzon).																			
26	At 15 ^h 15 ^m 02 ^s Eqke., III at Ormoc (W of Leyte).																			
89	30	I _v	V.	14	58	14	14	58	39	14	58	53	.02	2.4	15	01	V.C. 0.01 mm. Eqke., III at Baguio (central Luzon).			
90	30	I _d	V.	21	04	46				21	05	01	21	05	29	.06	2.4	21	08	V.C. 0.02 mm.
91	31	I	V.	17	42	49									18	10				
			H. WSW	17	42	51										18		06		

M. S. Maso

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 6, a.

June, 1910.

No.	Date	Char-acter.	Instrument and Component	Beginning			Maximum range of motion			Amplitude (2a) mm.	Period s.	End. h. m.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.						
							h.	m.	s.				
92	1	I _r	V.	14 05 25	14 09 18	14 14 08	14 15 26	0.01	7.2	14 42			
			H. NNW	14 05 25	14 09 25	14 14 10	14 17 10	.08	9.6	14 40			
			H. WSW	14 05 25	14 09 49	14 14 10	14 15 32	.10	7.8	14 40			
93	1	I _r	V.	14 58 13		15 06 18	15 08 21	.01	6.4	15 25			
			H. NNW	14 58 13		15 06 13	15 08 12	.09	9	15 24			
			H. WSW	14 58 13		15 06 17	15 08 55	.04	6.6	15 24			
94	2	I _v	V.	2 20 37		2 23 47	2 24 43	.04	2.4	2 42	Vertical Component 0.10 mm.		
			H. NNW	2 20 38		2 23 39	2 26 57	.24	9.6	2 39			
			H. WSW	2 20 38		2 23 35	2 25 41	.14	9	2 39			
	3	At 4 ^h 08 ^m Earthquake, III at Tacloban (NE of Leyte).											
95	4	I	V.	6 53 52							7 06		
			H. WSW	6 53 53								7 06	
96	6	I	V.	5 34 20							5 49		
			H. WSW	5 34 20								5 49	
97	6	I _v	V.	20 10 31		20 11 17	20 11 33	.31	2.4	20 22	V. C. 0.08 mm.		
			V.	20 40 00		20 40 12	20 42 25	1.90	2.4	20 55	V. C. 2.88 mm. Eqke., V in the SW part of Luzon.		
98	7	II _d	H. NNW	20 40 00		20 40 14	20 43 18	.23	4.5	20 52			
			H. WSW	20 40 00		20 40 13	20 42 38	.29	6.6	20 53			
99	9	I _r	V.	19 53 25		19 58 16	19 59 59	.03	2.4	20 20	V. C. 0.01 mm.		
			H. NNW	19 53 25		19 58 31	20 01 31	.15	10.8	20 39			
			H. WSW	19 53 25		19 58 30	20 01 58	.17	13.8	20 29			

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 6, b.



June, 1910.

No.	Date.	Char-acter.	Instrument and Component	Beginning.			Maximum range of motion.			Remarks.			
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a.)	Period		End.		
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.		h. m.		
13	At 8 ^h 58 ^m	Egke., III	at Tacloban (NE of Leyte).										
14	At 1 ^h 15 ^m	Egke., III	NE Mindanao and E of Leyte.										
100	15	I _v	V. H. NNW	21 28 08 21 28 08		21 29 18	21 29 30 21 30 18	.05 .11	2.4 10.4	21 41 21 44		Egke., V in the western Leyte.	
101	16	II _v	V. H. NNW H. WSW	14 40 24 14 40 26 14 40 26						16 57 16 56 16 42		V. C. 0.01 mm.	
16	At 22 ^h 14 ^m	Egke., III	at Butuan (N of Mindanao).										
102	17	II _v	V. H. NNW H. WSW	13 29 56 13 29 59 13 29 59		13 31 12 13 31 14 13 31 14	13 32 25 13 32 26 13 34 07	1.72 1.77 2.73	2.4 11.7 9.6	14 36 14 50 14 42		V. C. 0.09 mm. Egke., IV in the north- ern part of Luzon.	
17	At 17 ^h 12 ^m	Egke., III	at Tacloban (NE of Leyte).										
18	At 2 ^h 41 ^m	Egke., III	at Tacloban (NE of Leyte).										
103	20	I _d	V.	15 57 36		15 58 04	15 58 50	.06	2.4	16 03		V. C. 0.01 mm.	
104	21	I _v	V. H. NNW H. WSW	15 49 15 15 49 16 15 49 16		15 52 00 15 52 01 15 52 04	15 53 06 15 52 31	.11 .04	9.6 4.8	16 08 16 06			
105	22	I _d	V.	22 55 44		22 56 19		.01	2.4	23 00			
106	23	I _v	V.	10 52 19		10 53 29	10 54 33	.05	2.4	11 13		V. C. 0.01 mm.	

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 6, c.

June, 1910

No.	Date.	Character.	Instrument and Component.	Beginning			Maximum range of motion			End.	Remarks.	
				First preliminary tremors.	Second preliminary tremors.	Principal portion	Hour.	Amplitude (2a.)	Period			
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.		
107	24	I _v	V.	10 30 07						10 49	V. C. 0.01 mm.	
			H. NNW	10 30 08						10 56		
			H. WSW	10 30 08						10 52		
108	24	I _d	V.			13 03 26	13 03 28	.06	2.4	13 06	V. C. 0.02 mm.	
109	25	I _d	V.	6 08 45		6 09 01	6 09 05	.01	2.4	6 12	V. C. 0.01 mm.	
110	29	I _u	V.	18 56 58						20 32		
			H. NNW	18 56 58						20 22		
			H. WSW	18 56 58						20 15		
111	30	I _r	V.	2 12 37		2 16 43	2 18 35	.01	4.8	2 35	V. C. 0.01 mm.	
			H. NNW	2 12 38		2 16 44	2 17 22	.27	10.5	2 40		
			H. WSW	2 12 38		2 16 44	2 18 45	.07	6.6	2 37		
112	30	II _r	V.	10 56 58	11 00 32?	11 03 30?	11 05 01	.03	8	11 58		
			H. NNW	10 56 57	10 59 32?	11 03 05?	11 04 51	.77	10.8	12 16		
			H. WSW	10 56 57	10 59 33?	11 03 11?	11 04 38	.49	12	12 06		

M. Saderra H.

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 7, a.



July, 1910.

No.	Date	Char-acter.	Instrument and Component.	Beginning			Maximum range of motion			End.	Remarks.	
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a).	Period.			
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.		
113	1	I _d	V.	4 42 39		4 42 53	4 43 07	0.02	2.4	4 45	Vertical Component 0.01 m.m.	
114	1	I _v	V.	21 35 29						21 49		
			H. NNW	21 35 30						21 50		
115	2	II _v	V.	13 38 01		13 39 54	13 41 12	.11	2.4	14 40	Earthquake, VI at Agusan River Valley. Aftershocks at 14 ^h 05 ^m , 14 ^h 28 ^m and 16 ^h 05 ^m .	
			H. NNW	13 38 01		13 39 49	13 42 08	.72	12	14 35		
			H. WNW	13 38 01		13 39 54	13 42 50	.78	11.4	14 30		
	3	At 1 ^h 47 ^m Eqke., IV, Agusan River Valley (E of Mindanao).										
	3	At 8 ^h 59 ^m Eqke., III, Agusan River Valley.										
116	3	I _v	V.	9 59 13		10 01 03	10 01 56	.02	2.8	10 14	Eqke., VI Agusan River Valley with many aftershocks of intensity III on the same day and some lesser during a week.	
			H. NNW	9 59 14		10 01 01	10 02 39	.11	10.2	10 19		
			H. WSW	9 59 14		10 01 03	10 02 40	.07	7.5	10 17		
117	4	I _d	V.	9 13 25		9 13 43	9 14 08	.04	2.4	9 16	V.C. 0.01 m.m.	
118	5	I _d	V.	6 19 25		6 19 38	6 19 51	.04	2	6 22	V.C. 0.02 m.m.	
119	6	I	V.	2 34 58						3 10		
			H. NNW	2 34 59						3 12		
			H. WSW	2 34 59						3 11		
120	6	I _d	V.	17 37 54		17 38 09	17 38 49	.09	2.4	17 41		

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 7, b.

July, 1910.

No.	Date.	Char-acter.	Instrument and Component.	Beginning			Maximum range of motion			End.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a).	Period.		
121	7	II _r	V.	16 22 22	16 27 28?	16 31 36?	16 37 27	.02	16	17 25	
			H. NNW	16 22 23	16 27 43?	16 31 56?	16 38 54	.39	13.2	17 25	
			H. WSW	16 22 23	16 27 28?	16 31 58?	16 37 38	.18	12	17 15	
	8	At 6 ^h 10 ^m eqke., III at Butuan (N of Mindanao).									
122	8	I _r	V.	12 04 02						12 39	
			H. NNW	12 04 02						12 43	
			H. WSW	12 04 02						12 37	
123	11	I _d	V.	5 58 27		5 58 42	5 58 54	.03	2.4	6 01	
124	11	I _d	V.	8 01 10		8 01 15	8 01 19	.07	2.4	8 04	
	11	At 10 ^h 41 ^m eqke., III at Tacloban (NE of Leyte).									
125	12	I	V.	15 44 18						16 02	
			H. NNW	15 44 20						16 04	
	13	At 7 ^h 43 ^m 08 ^s eqke., III at Tacloban (NE of Leyte).									
126	18	I	V.	3 25 22						3 35	
			H. NNW	3 25 23						3 36	
127	19	II _d	V.	14 09 49		14 10 10	14 10 39	1.15	2.4	14 17	V. C. 0.17 mm.
			H. WSW	14 09 51		14 10 12	14 10 27	.20	4.8	14 17	
	20	At 4 ^h 39 ^m eqke., II at Tacloban (NE of Leyte).									

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 7, c.

July, 1910.



No.	Date	Char-acter.	Instrument and Component	Beginning			Maximum range of motion			End.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal portions.	Hour.	Amplitude (2a).	Period.		
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.	
128	21	I	{ V. H. NNW	15 19 23 15 19 26						16 05 16 17	
	22	At 12 ^h 49 ^m Eqke., III near the northeastern coast of Mindanao.									
129	22	I _v	{ V. H. NNW H. WSW	22 01 34 22 01 37 22 01 37		22 03 51 22 03 43 22 03 24	22 05 45 22 06 02 22 06 00	.02 1.08 .63	10 11.4 11.4	22 53 22 48 22 45	V. C. 0.01 mm. Eqke., V near the northeastern coast of Mindanao.
	22	At 22 ^h 04 ^m Eqke., II near the northeastern coast of Mindanao.									
	22	At 22 ^h 18 ^m Eqke., II at Surigao (NE of Mindanao).									
	22	At 22 ^h 25 ^m Eqke., II at Surigao (NE of Mindanao).									
	23	At 17 ^h 23 ^m Eqke., II at Surigao (NE of Mindanao).									
	25	At 3 ^h 48 ^m Eqke., II at Surigao (NE of Mindanao).									
	25	At 8 ^h 45 ^m Eqke., III at Surigao (NE of Mindanao).									
	26	At 21 ^h 39 ^m Eqke., II at Surigao (NE of Mindanao).									
130	29	I _d	{ V. V.	11 41 23 18 32 29		11 41 46 18 37 19	11 42 05 18 40 40	.13 .02	2.4 9.6	11 44 19 40	V. C. 0.09 mm. V. C. 0.01 mm.
131	29	II _r	{ H. NNW H. WSW	18 32 32 18 32 32	18 37 35 18 37 15	18 41 09 18 40 57	18 42 38 18 43 00	.47 .35	11.4 9.9	19 42 19 25	

A. Saderra H.

Manila Observatory — Philippine Islands.

Seismological Bulletin, No. 8.

August, 1910.

No.	Date.	Char-acter.	Instrument and Component.	Beginning.			Maximum range of motion.			End.	Remarks.		
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a).	Period				
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.			
132	2	I _r	V.	14 34 129							15 44		
			H. NNW	14 34 129								15 51	
			H. WSW	14 34 129								15 40	
133	8	I _v	V.	6 42 01		6 42 40	6 42 53	0.34	2.4	6 50	V.C. 0.13 mm. Epke., III at Legaspi and Nueva Ecija.		
			H. NNW	6 42 02		6 42 40	6 42 49	.12	4.5	6 51			
134	12	I _d	V.	22 57 33		22 57 50	22 58 21	.48	2.4	23 09	V.C. 0.20 mm.		
135	14	I _d	V.	19 08 07		19 08 22	19 08 24	.07	2.4	19 11	V.C. 0.02 mm.		
136	16	I _d	V.	2 40 10		2 40 21	2 40 23	.01	2.4	2 42	V.C. 0.01 mm.		
137	18	I	V.	7 04 03							7 26		
			H. NNW	7 04 07								7 27	
138	21	II	V.	13 48 40		13 56 54	13 57 39	.10	4	14 40	V.C. 0.07 mm.		
			H. NNW	13 48 41		13 56 54	13 57 46	1.03	11.4	14 37			
			H. WSW	13 48 41		13 56 54	13 58 00	1.20	8.7	14 23			
139	22	I _d	V.	1 43 01		1 43 37	1 44 15	.02	2.4	1 46	V.C. 0.01 mm.		
140	22	I _d	V.			14 25 22	14 25 24	.03	2.4	14 28	V.C. 0.01 mm.		
141	24	I _d	V.			23 33 13	23 33 15	.03	2	23 35	V.C. 0.01 mm.		
142	26	I _d	V.	3 57 46		3 58 24	3 58 33	.02	2.4	4 01	V.C. 0.01 mm.		

H.: period of oscillation { NNW pendulum, T = 11.8 seconds.
 WSW pendulum, T = 8.8 seconds.

M. Ladera

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 9, a. September, 1910.

No.	Date	Character	Instrument and Component	Beginning			Maximum range of motion			End	Remarks		
				First preliminary tremors	Second preliminary tremors	Principal portion	Hour	Amplitude (P.a.)	Period				
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.				
143	7	II _v	V.	8 46 57		8 48 36	8 49 30	1.56	2.4	10 04	Vertical Component 0.08 mm. Felt at Santo Domingo (Batanes Is.) with intensity II. Origin SW of Formosa.		
			H. NNW	8 46 57		8 48 39	8 51 37	4.20	10.8	10 30			
			H. WSW	8 46 57		8 48 38	8 50 08	4	8.1	10 12			
144	1	II _r	V.	22 23 35		22 27 10	22 31 03	.04	13.6	23 26	Formosa?		
			H. NNW	22 23 35		22 27 10	22 30 01	.26	11.1	23 26			
			H. WSW	22 23 35		22 27 09	22 31 02	.15	13.8	23 13			
145	3	I _d	V.	13 18 58		13 19 14	13 19 20	.06	2.4	13 22	V. C. 0.01 mm.		
146	4	I _d	V.	23 28 15		23 28 32	23 28 34	.09	2.4	23 31	V. C. 0.01 mm.		
147	5	I _d	V.	17 57 11		17 57 25	17 57 51	.12	2.4	18 01	V. C. 0.02 mm.		
	6	At 3 ^h 22 ^m earthquake, III in Leyte Island.											
148	7	I	V.	12 49 13							13 03		
			H. NNW	12 49 13								13 01	
			H. WSW	12 49 13								13 06	
149	7	II _r	V.	15 18 15	15 23 43?	15 29 40?	15 33 49	.02	12	16 22			
			H. NNW	15 18 15	15 23 56?	15 29 33?	15 33 23	.05	13.2	16 25			
			H. WSW	15 18 15	15 23 49?	15 29 36?	15 33 39	.10	15.6	16 32			
150	9	I _r	V.	9 23 47	9 28 38?	9 33 12?	9 34 29	.01	8.8	10 30			
			H. NNW	9 23 48	9 28 29?	9 32 52?	9 34 42	.06	8.4	10 25			
			H. WSW	9 23 48	9 28 17?	9 33 13?	9 34 31	.08	7.8	10 27			

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 9, 6. September, 1910.

No.	Date	Char-acter.	Instru-ment and Component	Beginning			Maximum range of motion			End.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour	Amplitude (La.)	Period		
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.	
151	10	I	V.	20 35 16						21 05	
			H. NNW	20 35 16						21 00	
			H. WSW	20 35 16						21 05	
152	14	I _r	V.	22 00 26		22 04 41	22 05 22	.02	4.8	22 23	V. C. 0.01 mm.
			H. NNW	22 00 26		22 04 23	22 05 23	.03	5	22 21	
			H. WSW	22 00 26		22 04 34	22 06 06	.11	11.4	22 26	
153	17	II _v	V.							8 41	V. C. 0.09 mm. Egeke., II north of Luzon.
			H. NNW	7 10 02		7 11 24	7 15 28	2.93	9.9	8 27	
			H. WSW	7 10 02		7 11 17	7 17 26	3.51	9	8 35	
154	24	I _d	V.	7 51 25		7 51 38	7 51 44	.03	2.4	7 55	V. C. 0.01 mm.

M. Saderra

Manila Observatory.- Philippine Islands.

Seismological Bulletin, No. 10, a.



October, 1910.

No.	Date	Character	Instrument and Component	Beginning.			Maximum range of motion.			Remarks.		
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (La.)	Period.			
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.			
155	3	At 4 ^h 28 ^m Earthquake, III at Nueva Caceres (SE of Luzon).	I _v V.	4 35 15		4 35 40	4 36 18	0.05	2.4	4 39	Vertical Component 0.01 mm. Eqke., III at Nueva Caceres (SE of Luzon).	
156	3	II _v	V.	5 17 27		5 17 54	5 18 38	1.60	2.4	6 16	V. C. 0.78 mm. Eqke., V southeast- ern part of Luzon.	
			H. NNW	5 17 30		5 17 56	5 19 06	2	6.6	6 20		
			H. WSW	5 17 30		5 17 56	5 21 07	2.35	8.4	6 20		
	3	At 5 ^h 26 ^m Eqke., III at Nueva Caceres (SE of Luzon).										
157	3	At 12 ^h 05 ^m Eqke., II at Nueva Caceres (SE of Luzon).	I _v	V.	12 52 30		12 52 57	12 53 48	.40	2.4	13 08	V. C. 0.26 mm. Eqke., IV southeastern part of Luzon.
				H. NNW	12 52 31		12 52 59	12 53 57	.46	7.2	13 08	
				H. WSW	12 52 31		12 53 00	12 54 04	.42	7.5	13 15	
158	3	I _v V.	13 29 04		13 29 23	13 30 19	.12	2.4	13 38	V. C. 0.05 mm. Eqke., IV at Nueva Caceres.		
159	5	At 16 ^h 38 ^m Eqke., II at Nueva Caceres (SE of Luzon).	I _v	V.	7 20 14					8 02		
				H. NNW	7 20 14					8 07		
				H. WSW	7 20 14					8 09		
160	5	I _d V.	10 29 11		10 29 22	10 29 26	.09	2.4	10 32	V. C. 0.03 mm.		
161	7	I _d V.	3 01 13		3 01 27	3 01 35	.02	2.4	3 04	Eqke., III at Nueva Caceres (SE of Luzon).		
162	7	I _v	V.	18 32 35		18 33 06	18 33 29	.36	2.4	18 43	V. C. 0.04 mm. Eqke., III at Tagueta- rac (N of Luzon).	
			H.	18 32 35		18 33 06	18 34 31	.07	4.8	15 42		

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 10, b.

October, 1910.

No.	Date.	Character	Instrument and Component	Beginning.			Maximum range of motion			Amplitude (Lc.)	Period.	End.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal position.	How.	How.					
									h. m. s.				
163	14	I ₂	V.	8 15 43		8 16 01	8 16 03	.09	2.2	8 19	V. C. 0.05 mm.		
164	15	I ₂	V.	13 35 58		13 36 03	13 36 17	.07	2.4	13 39	V. C. 0.03 mm.		
165	18	I ₁	V.	2 14 15		2 14 41	2 14 44	.04	2.4	2 17	V. C. 0.01 mm.		
	18	About 3 ^h 40 ^m Ekyke., IV at Surigao (NE of Mindanao).											
	18	At 20 ^h 15 ^m Ekyke., III at Tacloban (NE of Leyte).											
166	20	I ₂	V.	15 34 58		15 35 20	15 35 22	.08	2.4	15 39	V. C. 0.04 mm.		
			V.	12 47 06						13 09	V. C. 0.01 mm.		
167	24	I	H. NNW	12 47 06						13 10			
			H. WSW	12 47 06						13 20			
			V.	15 42 51						16 00			
168	24	I	H. NNW	15 42 51						16 01			
			H. WSW	15 42 51						16 07			
169	25	I ₂	V.	9 41 31		9 42 07	9 42 22	.01	2.4	9 45	V. C. 0.01 mm. Ekyke., III at Legaspi (SE of Luzon).		
170	26	I ₂	V.	7 52 17		7 52 36	7 52 55	.30	2.4	8 00	V. C. 0.10 mm.		
			H. WSW	7 52 18		7 52 37				8 01			
171	29	I ₁	V.	22 27 57		22 28 11	22 28 33	.02	2.4	22 31	V. C. 0.01 mm.		
172	30	I ₂	V.	10 26 26		10 26 52	10 26 57	.10	2.4	10 30	V. C. 0.03 mm.		

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Manila Observatory.- Philippine Islands.

Seismological Bulletin, No. 11, b.

November, 1910.

No.	Date.	Character	Instrument and Component	Beginning			Maximum range of motion.			End.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	Hour.	Amplitude (2a).	Period		
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.	
179	21	I _v	V.	3 03 34		3 04 22	3 04 26	.03	2.4	3 08	Egke., III at Calbayog (NW of Samar).
180	24	I	H. WSW	23 51 9						0 20	
181	26	I _r	H. WSW	3 14 45						3 45	
182	26	II _r	V.	12 50 42	12 54 52	12 58 32	13 02 34	.02	20	14 16	
			H. NNW	12 50 43	12 54 46	12 58 21	13 02 30	.13	20	13 41	
			H. WSW	12 50 42	12 54 45	12 58 32	12 58 50	.36	9	13 57	
183	26	I _r	V.	14 22 35	14 25 36	14 28 40	14 31 29	.01	8.8	15 20	
			H. NNW	14 22 35	14 25 35	14 28 42	14 31 21	.04	8.4	15 10	
			H. WSW	14 22 35	14 25 35	14 28 38	14 31 28	.19	9	15 20	
184	26	I _r	V.	16 18 26						16 51	
			H. NNW	16 18 26						16 47	
			H. WSW	16 18 26						16 54	
27	Oct 5 ^h 25 ^m			Egke., III at Butuan (N of Mindanao).							
185	29	II _v	V.	10 28 26	10 30 17	10 32 14	10 34 21	.16	9.2	12 12	V. C. 0.02 mm.
			H. NNW	10 28 26	10 30 07	10 32 16	10 36 47	1.60	8.4	11 51	
			H. WSW	10 28 26	10 29 54	10 32 02	10 36 35	2.60	8.7	12 12	
186	29	II _v	V.	19 47 31		19 49 14	19 49 29	.90	2.4	20 22	V. C. 0.03 mm.
			H. NNW	19 47 31		19 49 13	19 49 38	1.06	6.6	20 16	
			H. WSW	19 47 31		19 49 13	19 50 40	.93	7.8	20 28	
187	29	I _d	V.	23 37 48		23 37 55	23 38 03	.03	2.4	23 41	

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Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 12, a. December, 1910.



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No.	Date	Character	Instrument and Component	Beginning.			Maximum range of motion.			Amplitude (2a.)	Period	End.	Remarks.
				First preliminary tremors.	Second preliminary tremors.	Principal portion.	How.	How.	How.				
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.		
188	1	I	V.	19 27 45							19 41		
189	1	II _r	V.	23 46 35	23 49 42	23 53 39	0 00 32		0.02	10.4	0 50	Vertical Component 0.01 mm.	
			H. NNW	23 46 37	23 49 45	23 53 32	23 56 38		.18	9.6	0 33		
190	4	I	H. WSW	23 46 37	23 49 36	23 53 34	23 57 26		.23	8.7	0 47		
			V.			19 18 03						20 00	
191	4	II	H. WSW			19 18 03					20 01		
			V.	23 46 58		23 47 13	23 47 57		1.68	2.4	23 54	V. C. 0.69 mm.	
192	6	I	H. NNW	23 46 59		23 47 14	23 47 47		.41	5.1	23 53		
			H. WSW	23 46 59		23 47 14	23 47 45		.33	3.6	23 53		
193	9	I _d	V.			0 30 25					0 53		
			H. WSW			0 32 00						1 06	
194	10	II _u	V.	22 43 23		22 43 59	22 44 13		.12	2.4	22 47	V. C. 0.18 mm.	
			V.	17 35 22	17 42 35	17 48 49	17 53 18		.05	22.4	19 25	V. C. 0.01 mm.	
195	13	II _u	H. NNW	17 35 24	17 42 38	17 50 09	17 53 22		.30	19.5	19 12		
			H. WSW	17 35 24	17 42 38	17 49 56	17 53 02		.27	17.7	19 18		
195	14	At 15 ^h 55 ^m Ege. III at Tumanas (Sarangani I. south of Mindanao).	V.	19 50 53	20 03 21	20 19 30	20 34 34		.02	18.4	21 39		
			H. NNW	19 50 58	20 04 30	20 21 11	20 44 54		.07	17.4	21 40		
			H. WSW	19 50 58	20 03 11	20 20 56	20 34 28		.09	18.6	21 35		

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 12, b.

December, 1910.



No.	Date	Character	Instrument and Component	Beginning.									Maximum range of motion			Remarks.				
				First preliminary tremors.			Second preliminary tremors.			Principal portion.			Hour.	Amplitude (2a)	Period.		End.			
				h.	m.	s.	h.	m.	s.	h.	m.	s.						h.	m.	s.
196	15	I _r	V.	4	56	27	5	00	06	5	04	22	5	05	48	.08	2.4	5	36	V.C. 0.06 mm.
			H. NNW	4	56	27	4	59	31	5	07	42	5	04	00	.11	8.4	5	33	
			H. WSW	4	56	27	4	59	42	5	03	18	5	06	49	.19	8.4	5	31	
	15	At 15 ^h 35 ^m 45 ^s Eqke., III at Cotabato (Mindanao).																		
197	16	II _r	V.	22	47	30	22	49	30	22	52	32	22	54	23		16	1	01	V.C. 0.06 mm. Origin NE of Celebes Sea.
			H. NNW	22	47	32	22	50	09	22	52	03	22	53	36					
			H. WSW	22	47	32	22	50	05	22	52	00	22	54	34			1	04	
198	17	I _r	V.	2	55	09	2	57	14	2	59	37	3	02	56	.17	10.4	4	35	V.C. 0.01 mm. Origin NE of Celebes Sea.
			H. WSW	2	55	09	2	57	17	2	59	42						4	24	
			At 2 ^h 59 ^m 06 ^s Eqke., II at Zamboanga (W Mindanao).																	
199	17	I _r	V.	7	20	04												8	20	
			H. WSW	7	20	04													8	
200	17	I _r	V.	14	23	58	14	26	05	14	28	37	14	32	10	.02	11.2	15	00	V.C. 0.01 mm. Eqke., III at Cotabato (S Mindanao).
			H. NNW	14	23	58	14	26	09	14	28	39	14	31	19	.13	13	15	05	
			H. WSW	14	23	58	14	26	00	14	28	54	14	32	14	.26	8.4	15	06	
201	18	II _r	V.	10	47	45				10	53	09	10	57	47	.03	10.8	12	00	V.C. 0.01 mm. Eqke., III at Cotabato (S Mindanao).
			H. NNW	10	47	46				10	52	19	10	57	48	.21	13.5	11	49	
			H. WSW	10	47	46				10	52	12	10	57	47	.32	9	11	57	
202	19	I _d	V.	14	24	53				14	25	02	14	25	08	.36	2.4	14	29	V.C. 0.25 mm.

Manila Observatory. - Philippine Islands.

Seismological Bulletin, No. 12, c.



December, 1910.

No.	Date	Character	Instrument and Component	Beginning			Maximum range of motion			Remarks.		
				First preliminary tremors.	Second preliminary tremors	Principal position	Hour	Amplitude (2 _u)	Period		End.	
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.		h. m.	
203	19	I _d	V.	14 42 12		14 42 21	14 42 27	.04	2.4	14 45	V.C. 0.03 mm.	
204	21	I _d	V.	20 27 23		20 27 39	20 27 55	.12	2.4	20 31	V.C. 0.05 mm.	
205	22	I _d	V.	10 49 48		10 50 08	10 50 33	.03	2.4	10 54	V.C. 0.01 mm.	
206	26	I _r	V.	13 41 44	13 46 24	13 51 20	13 52 43	.01	10.4			
			H. NNW	13 41 44	13 46 22	13 51 03	13 54 21	.01	9			
207	26	I	H. WSW	13 41 44	13 46 14	13 51 06	13 52 33	.05	9.6			
			V.	14 11 32							14 30	
207	26		H. WSW	14 11 21						14 36		
208	27		At 21 ^h 47 ^m quake, III at Butuan (N Mindanao).									
208	27	I _r	V.	10 29 30			10 40 46	.01	11.6	11 09		
			H. NNW	10 29 30			10 39 14	.08	9.3	11 02		
			H. WSW	10 29 30			10 40 52	.13	9.3	11 08		
209	28	I	V.			2 03 54			2 27			
			H. WSW			2 03 54			2 25			
210	28	I _r	V.	2 54 41	2 58 05	3 01 52	3 04 02	.04	9.6	4 03		
			H. NNW	2 54 49	2 57 39	3 01 43	3 05 16	.51	7.8	4 01		
			H. WSW	2 54 49	2 58 08	3 01 48	3 06 18	1.05	8.1	4 12		
211	28	I	V.			14 40 00			15 04			
			H. NNW			14 40 00			15 12			
			H. WSW			14 40 00			15 12			

Manila Observatory - Philippine Islands.



Seismological Bulletin, No. 12, d. December, 1910.

No.	Date	Character	Instrument and Component	Beginning			Maximum range of motion			End.	Remarks.
				First preliminary tremors	Second preliminary tremors	Principal portions	Hour	Amplitude (La.)	Period		
				h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.		
212	29	II _r	V.	21 08 57	21 12 12	21 15 09	21 17 39	.08	8.8		
			H. NNW	21 08 57	21 12 09	21 15 11	21 19 50	1.19	8.1		
			H. WSW	21 08 57	21 12 21	21 15 25	21 19 36	1.61	8.7		
213	29	I _r	V.	21 26 03	21 29 26	21 32 08	21 36 15	.03	11.2	22 47	
			H. NNW	21 26 ?						22 36	
			H. WSW	21 26 ?						22 59	
214	30	II _v	V.	8 49 26		8 50 54	8 52 19	1.24	2.4	10 09	V.C. 0.04 mm. Epke. in the E part of eastern Visayas.
			H. NNW	8 49 27		8 50 55	8 52 19	3.01	8.1	10 11	
			H. WSW	8 49 27		8 50 55	8 51 41	3	9.6	10 23	
215	30	I	V.			20 25 25				20 46	
			H. WSW			20 25 25					20 51
216	31	I _r	V.	2 55 03	2 57 25	3 00 10	3 01 12	.02	10.4	3 51	
			H. NNW	2 55 03	2 57 22	3 00 27	3 01 37	.21	8.1	3 40	
			H. WSW	2 55 03	2 57 20	3 00 29	3 02 24	.28	9.9	3 53	

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