

Aug Oct 1909
Ref 2913



Seismological Bulletin

Manila Observatory — Philippine Islands.
August, 1909.

No. 8
a.

No.	Date.	Component	Beginning			Maximum range of motion.				Instrument	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.											
159	8	At 4 ^h 32 ^m Earthquake, IV in Butuan Bay.																		
		NNW-SSE	5	48	53	5	49	10	5	49	14	0.03	2.4	5	52	V.M.				
69	8	WSW-ENE	5	48	53	5	49	09	5	49	12	.04	1.8	5	52	V.M.				
		NNW-SSE	19	24	55				19	28	26	.06	2.4	20	15	V.M.	Earthquake, IV at Butuan (N of Mindanao).			
160	12	NNW-SSE	19	25	00									19	55	H.P.				
		WSW-ENE	19	24	56	19	26	59	19	29	16	.09	2.2	20	12	V.M.				
161	13	WSW-ENE	19	25	01	19	27	06	19	28	27	.33	8.1	20	10	H.P.				
		NNW-SSE	18	21	41										18	49	V.M.	Eqke. III at Butuan (N of Mindanao).		
161	13	NNW-SSE	18	21	57									18	46	H.P.				
		WSW-ENE	18	21	41										18	50	V.M.			
162	13	WSW-ENE	18	21	57									18	46	H.P.				
		At 20 ^h 45 ^m Eqke. V at Davao (S of Mindanao).																		
162	14	NNW-SSE	14	36	15	14	40	43	14	45	13	14	45	53	.02	8.8	15	53	V.M.	Eqke. at Gifu (Japan).
		NNW-SSE	14	36	18	14	40	24	14	45	18	14	45	58	.31	8.1	15	58	H.P.	
163	14	WSW-ENE	14	36	15	14	40	40	14	45	21	14	47	36	.02	8	15	57	V.M.	
		WSW-ENE	14	36	20	14	40	48	14	45	21	14	48	20	.43	9	15	54	H.P.	
163	14	At 19 ^h 45 ^m 02 ^s Eqke., IV at Davao (S of Mindanao).																		
163	15	At 20 ^h 25 ^m 03 ^s Eqke., IV at Davao (S of Mindanao).																		
		NNW-SSE	17	19	17	17	19	35	17	19	37	.10	2.2	17	24	V.M.	Vertical Component 0.05 mm.			
164	18	WSW-ENE	17	19	17	17	19	35	17	19	50	.07	2.4	17	24	V.M.				
		NNW-SSE	8	49	35										9	24	V.M.			
164	18	NNW-SSE	8	49	36										9	30	H.P.			
		WSW-ENE	8	49	36										9	24	V.M.			
165	19	WSW-ENE	8	49	36										9	30	H.P.			
		NNW-SSE	23	59	36	23	59	51	23	59	54	.03	1.2	0	02	V.M.	V.C. 0.01 mm.			
165	19	WSW-ENE	23	59	36	23	59	51	23	59	55	.03	1.6	0	02	V.M.				
		NNW-SSE	8	11	50	8	11	54	8	11	56	.22	2	8	14	V.M.	V.C. 0.21 mm.			
166	20	WSW-ENE	8	11	50	8	11	55	8	11	56	.32	1.8	8	14	V.M.				
		At 4 ^h 05 ^m Eqke., II at Calbayog (NW of Samar).																		
167	22	NNW-SSE	0	03	29	0	03	45	0	04	09	.12	2.4	0	08	V.M.	V.C. 0.02 mm.			
		WSW-ENE	0	03	29	0	03	45	0	04	09	.10	2.4	0	08	V.M.				

M. Ledesma

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			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.			
168	26	NNW-SSE	9 49 26		9 49 46	9 50 07	1.75	2.4	10 17	V.M.	Vertical Component 0.32 m.m. Earthquake in the southern part of Luzon.
		NNW-SSE	9 49 29		9 49 46	9 50 34	.91	3.4	10 13	H.P.	
		WSW-ENE	9 49 27		9 49 43	9 50 23	1.52	2.4	10 17	V.M.	
		WSW-ENE	9 49 29		9 49 48	9 50 47	2.57	9.6	10 13	H.P.	
169	26	NNW-SSE	23 10 10		23 10 26	23 10 37	.09	1.2	23 13	V.M.	V.C. 0.04 m.m.
		WSW-ENE	23 10 10		23 10 27	23 10 35	.13	2.2	23 13	V.M.	
170	27	NNW-SSE	17 42 47						18 04	V.M.	
		WSW-ENE	17 42 50						18 02	H.P.	
171	28	NNW-SSE	10 01 26						10 21	V.M.	V.C. 0.02 m.m.
		WSW-ENE	10 01 26						10 21	V.M.	
172	29	NNW-SSE	18 32 20						19 09	V.M.	
		NNW-SSE	18 32 29						19 05	H.P.	
		WSW-ENE	18 32 20						19 09	V.M.	
		WSW-ENE	18 32 29						19 07	H.P.	
173	29	NNW-SSE	19 11 51		19 13 12	19 14 00	.26	2.4	19 32	V.M.	V.C. 0.04 m.m.
		NNW-SSE	19 11 54		19 13 17	19 13 25	.31	4.8	19 30	H.P.	
		WSW-ENE	19 11 51		19 13 12	19 13 17	.53	2.4	19 31	V.M.	
		WSW-ENE	19 11 54		19 13 19	19 13 27	.67	9	19 30	H.P.	

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No.	Date	Component	Beginning			Maximum range of motion.			Amplitude (L.C.)	Period	End.	Instrument	Remarks.
			First preliminary tremors.	Second preliminary tremors.	Principal portion	Hour.	Hour.	Hour.					
			h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.					
74	2	NNW-SSE	20 32 30							20 59	V.M.		
		NNW-SSE	20 32 33							20 54	H.P.		
		WSW-ENE	20 32 30							20 56	V.M.		
		WSW-ENE	20 32 33							20 54	H.P.		
75	2	NNW-SSE	21 53 32		21 53 47	21 53 49	0.03	2.2	21 56	V.M.			
		NNW-SSE	22 39 36							23 05	V.M.		
76	6	NNW-SSE	22 39 39							23 08	H.P.		
		WSW-ENE	22 39 36							23 05	V.M.		
		WSW-ENE	22 39 39							23 08	H.P.		
77	9	NNW-SSE	1 00 26	1 05 40	1 09 49	1 10 53	.01	6.4	1 40	V.M.			
		NNW-SSE	1 00 35	1 05 43	1 09 46	1 11 03	.08	7.5	1 37	H.P.			
		WSW-ENE	1 00 26	1 05 38	1 09 56	1 11 56	.01	6.8	1 40	V.M.			
		WSW-ENE	1 00 35	1 05 58	1 09 51	1 12 11	.13	8.4	1 37	H.P.			
178	9	NNW-SSE	7 24 09		7 27 51	7 28 18	.02	4	8 04	V.M.	Vertical Component		
		NNW-SSE	7 24 10		7 27 58	7 31 35	.10	3.1	8 04	H.P.	0.01 mm.		
		WSW-ENE	7 24 09		7 27 57	7 28 55	.03	2.8	8 04	V.M.			
		WSW-ENE	7 24 10		7 27 57	7 28 31	.17	7.2	8 09	H.P.			
179	10	NNW-SSE	17 45 06		17 45 23	17 45 27	.77	2.4	17 53	V.M.	V.C. 0.33 mm.		
		WSW-ENE	17 45 06		17 45 24	17 45 28	.52	2.4	17 53	V.M.			
11 At 1 ^h 30 ^m Earthquake, intensity III at Catbalogan (W of Samar).													
180	11	NNW-SSE	2 12 39		2 15 45	2 16 35	.08	2.4	2 32	V.M.			
		NNW-SSE	2 12 43		2 15 45	2 16 00	.10	5.4	2 30	H.P.			
		WSW-ENE	2 12 39		2 15 45	2 16 29	.06	2.4	2 32	V.M.			
		WSW-ENE	2 12 43		2 15 45	2 17 26	.10	6.6	2 31	H.P.			
181	11	NNW-SSE	3 47 53		3 49 01	3 49 11	.39	2.4	4 15	V.M.	V.C. 0.04 mm. Epke, IV		
		NNW-SSE	3 47 54		3 49 07	3 50 31	.31	7.2	4 15	H.P.	at Catbalogan, Tacloban and Virao.		
		WSW-ENE	3 47 53		3 49 20	3 50 04	.18	2.4	4 15	V.M.			
		WSW-ENE	3 47 54		3 49 13	3 49 40	.68	8.4	4 15	H.P.			
11 At 3 ^h 54 ^m 20 ^s Epke, IV at Butuan (N of Mindanao).													
182	11	NNW-SSE	18 55 44							20 18	V.M.	V.C. 0.01 mm.	
		NNW-SSE	18 55 49							20 16	H.P.		
		WSW-ENE	18 55 44							20 18	V.M.		
		WSW-ENE	18 55 49							20 16	H.P.		
183	12	NNW-SSE	7 41 50		7 41 56					8 16	V.M.	V.C. 1.75 mm. Origin	
		WSW-ENE	7 41 50		7 41 56					8 16	V.M.	about 40 kms. S. of Manila.	

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			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.			
184	13	NNW-SSE	6 22 47		6 23 05	6 23 07	0.11	2.4	6 27	V.M.	V.C. 0.09 mm.
		WSW-ENE	6 22 47		6 23 05	6 23 07	.13	2.4	6 27	V.M.	
185	17	NNW-SSE	2 51 57						3 28	V.M.	V.C. 0.08 mm.
		WSW-ENE	2 54 57						3 28	V.M.	
186	17	WSW-ENE	2 54 59						3 25	H.P.	
		NNW-SSE	3 45 27	3 48 34	3 50 43	3 51 47	.04	3.2	4 19	V.M.	
		WSW-ENE	3 45 27	3 43 43	3 50 48	3 51 45	.02	6	4 16	V.M.	
187	20	WSW-ENE	3 45 27	3 43 09	3 50 32	3 51 20	.13	8.4	4 15	H.P.	
		19 Oct 2 ^h 03 ^m Epike., III at Vigan. (NW of Luzon).									
		NNW-SSE	7 27 26		7 27 41	7 27 47	.12	2.8	7 31	V.M.	V.C. 0.09 mm.
188	22	WSW-ENE	7 27 26		7 27 41	7 27 46	.08	3.2	7 31	V.M.	
		NNW-SSE	2 55 03	2 57 27	3 00 04				3 31	V.M.	V.C. 0.02 mm.
		WSW-ENE	2 55 03	2 57 37	3 00 08				3 31	V.M.	
189	24	WSW-ENE	2 55 04	2 57 38	3 00 08	3 01 05	.03	11.4	3 34	H.P.	
		NNW-SSE	3 03 58		3 04 25	3 04 35	.11	2.4	3 08	V.M.	V.C. 0.06 mm.
		WSW-ENE	3 03 58		3 04 22	3 04 25	.08	2.2	3 08	V.M.	
190	28	27 Oct 2 ^h 17 ^m 30 ^s Epike., III at Vigan. (NW of Luzon).									
		NNW-SSE	8 06 01		8 08 22	8 08 36	.14	2.4	8 20	V.M.	V.C. 0.05 mm.
		NNW-SSE	8 06 02		8 08 01				8 21	H.P.	
191	29	WSW-ENE	8 06 01		8 08 03	8 08 25	.22	2.4	8 19	V.M.	
		WSW-ENE	8 06 02		8 08 06				8 20	H.P.	
		NNW-SSE	4 00 51		4 01 52	4 03 10	.41	2.4	4 17	V.M.	V.C. 0.07 mm.
192	29	NNW-SSE	4 01 00		4 01 58	4 03 00	.24	6.4	4 18	H.P.	
		WSW-ENE	4 00 54		4 01 44	4 02 18	.46	2.4	4 17	V.M.	
		WSW-ENE	4 01 00		4 02 04	4 03 54	.25	9	4 20	H.P.	
193	29	NNW-SSE	10 07 35		10 08 30	10 09 00	.08	2.4	10 22	V.M.	V.C. 0.04 mm.
		NNW-SSE	10 07 37		10 08 38	10 09 26	.03	4.8	10 21	H.P.	
		WSW-ENE	10 07 35		10 08 25	10 08 29	.08	2.4	10 22	V.M.	
193	29	WSW-ENE	10 07 37		10 08 41	10 08 56	.04	3.6	10 20	H.P.	
		NNW-SSE	20 01 04		20 01 19	20 01 40	.03	2	20 05	V.M.	V.C. 0.02 mm.
		WSW-ENE	20 01 04		20 01 18	20 01 20	.03	2	20 05	V.M.	

M. S. Maso

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October, 1909.

No. 10.

No.	Date	Component	Beginning			Maximum range of motion.			End.	Instru-ment.	Remarks.
			First preliminary bearing.	Second preliminary bearing.	Principal position.	Hours.	Amplitude (2a)	Period.			
			h. m. s.	h. m. s.	h. m. s.	h. m. s.	mm.	s.	h. m.		
194	3	NNW-SSE			15 40 25	15 46 33	0.04	2.4	15 43	V.M.	Vertical Component 0.02 mm.
		WSW-ENE			15 40 25	15 40 51	.03	2.4	15 43	V.M.	
	7	At 8 ^h 40 ^m Earthquake, II at Capiz (N of Panay).									
	9	At 1 ^h 37 ^m Eque., III at Surigao (NE of Mindanao).									
	9	At 23 ^h 20 ^m Eque., III at Butuan (N of Mindanao).									
	9	At 23 ^h 59 ^m Eque., III at Surigao (NE of Mindanao).									
195	12	NNW-SSE	10 28 39		10 28 53	10 29 24	.04	2.4	10 33	V.M.	V.C. 0.04 mm.
		WSW-ENE	10 28 39		10 28 53	10 29 58	.05	2.4	10 33	V.M.	
196	14	NNW-SSE	12 51 00		12 51 14	12 51 15	.10	1.2	12 54	V.M.	V.C. 0.06 mm.
		WSW-ENE	12 51 00		12 51 15	12 51 16	.09	2	12 54	V.M.	
	17	At 23 ^h 35 ^m Eque., II at Butuan (N of Mindanao).									
197	21	NNW-SSE	7 50 13	8 01 27	8 12 46	8 22 55	.01	12.2	8 59	V.M.	
		NNW-SSE	7 50 18	8 01 00	8 12 12	8 22 45	.03	12	8 56	H.P.	
		WSW-ENE	7 50 13	8 01 22	8 12 32	8 20 35	.01	11.6	8 58	V.M.	
		WSW-ENE	7 50 18	8 01 20	8 12 29	8 18 41	.07	13.2	8 57	H.P.	
	21	At 18 ^h 25 ^m 30 ^s Eque., III at Butuan (N of Mindanao).									
	24	At 3 ^h 30 ^m Eque., III at San Isidro (Central Luzon).									
198	29	NNW-SSE	10 19 02						10 58	V.M.	
		NNW-SSE	10 19 03						10 56	H.P.	
		WSW-ENE	10 19 02						10 58	V.M.	
		WSW-ENE	10 19 03						10 56	H.P.	
199	30	NNW-SSE	18 22 19						18 58	V.M.	V.C. 0.53 mm.
		NNW-SSE	18 22 20						18 57	H.P.	
		WSW-ENE	18 22 19						18 58	V.M.	
		WSW-ENE	18 22 20						18 58	H.P.	

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