

Year 1922, No. 1.

January 1st to 7th, 1922.

MANILA

SEISMOLOGICAL BULLETIN

1922

$\phi=14^{\circ} 34' 41''$  N.  $\lambda=120^{\circ} 58'$  W.

2636 ~~Fitz~~ Ref

um.

Instrument: Wiechert's as

(=,000 kgs.)

	$T_0$	$\epsilon$	$\frac{r}{T_0^2}$
$A_N$ :	6.25	2.906	0.053
$A_E$ :	6.18	2.393	0.042

No.	Date	Char-acter	Phase	Greenwich mean time		Per-iod	Amplitude		$\Delta$	Remarks.
				h.	m. s.		$A_N$	$A_E$		
							$\mu$	$\mu$	Kms.	
1	1	I <sub>v</sub>	eP L F	0	02 36 57 13					
2	1	I	e F	12	10 30 36					From Omori's seis-mograph.
3	1	I	e F	19	58 30 20 36					From Omori's seis-mograph.
4	3	I <sub>r</sub>	eP L? F	21	07 20 15 47 49					
5	3	I	e F	23	59 0 26					
6	4	I <sub>v</sub>	eP F	0	57 06 59					
7	4	I <sub>r</sub>	eP L? F	13	51 47 55 57 14 13					
8	4	I <sub>r</sub>	eP L? F	19	09 33 13 08 27					
9	5	I	e F	19	22 50 39					Felt at Guam (Mar-iana Islands).
10	5	I <sub>v</sub>	eP F	23	08 22 36					
11	6	I	e F	14	34 30 15 17					From Omori's seis-mograph.
12	7	II <sub>r</sub>	eP L ME MN	8	31 00 34 15 35 34 35 37	10 11	91	32		End overtaken by following quake.
13	7	II <sub>r</sub>	eP L MN ME F	9	22 57 26 22 26 44 27 28 10 43	10 7	215	112		Felt at Butuan (N Mindanao).

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.---Continued.

No.	Date.	Char-acter	Phase	Greenwich mean time.			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>		
14	7	I <sub>r</sub>	eP F	20	52	48 04		}}	}}		Felt at Surigao (NE Mindanao).
15	9	I <sub>u</sub>	e L? MN1 ME1 MF2 ME2 F	5 6	31 23	50 18 32 54 31 40 04					
							30	11		10	
							30				
							25	19			
							24			18	
16	10	I <sub>v</sub>	eP F	2	23	01 27					Felt in Romblon I.
17	10	I	e F	8	39	52					
18	10	II <sub>v</sub>	eP L MN ME F	13	43	2L 29 48 49 45					
							7	149		83	
							7				
19	13	I <sub>r</sub>	e F	13	08	00 30					
20	14	I <sub>v</sub>	eP L MN ME F	11	31	42 36 47 48 52					Felt at Tigaon (SE Luzon).
							4	135		80	
							4				
21	14	I	e F	20	29	48 04					Felt at Camp Keithley (N Mindanao).
22	16	I <sub>v</sub>	eP L F	5	35	46 49 55					
23	16	I <sub>r</sub>	eP L MN ME F	17	15	18 48 06 10 38					
							8	62		36	
							9				
24	17	II <sub>u</sub>	e S? L? MN ME F	4	09	37 37 55 15 46 52					
							13	80		57	
							14				
25	17	I <sub>v</sub>	eP F	19	50	00 53					
26	19	I <sub>v</sub>	eP F	16	26	00 40					Felt at Camp Keithley (N Mindanao).
27	19	II <sub>r</sub>	eP S L MN ME F	22	05	16 08 55 02 08 30					
							8	173		92	
							7				

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		AN	AE		
				h.	m.	s.	s.	$\mu$	$\mu$	Kms.	
28	20	I	e F	7	00	27					
29	20	I	e F	17	36	18 11					
30	21	I	e F	19	51	20 12					
31	22	I <sub>u</sub>	e S? L? F	3	38	32 44 25 56 12 5 02					
32	22	I	e F	14	48	15 11					
33	22	I <sub>r</sub>	eP L F	15	29	50 34 29 16 01					
34	22	I <sub>r</sub>	eP L F	20	56	55 21 04 29 22 02					
35	22	I <sub>r</sub>	eP L F	22	11	49 21 57 35					
36	23	I <sub>r</sub>	eP L F	3	42	39 46 44 4 04					
37	23	I <sub>r</sub>	eP L ME MN F	16	41	49 46 44 46 57 47 27 18 01	14 14	62	28		
38	26	I <sub>v</sub>	eP L F	8	39	40 41 45 55					
39	29	I	e F	4	00	51 47					
40	29	I <sub>r</sub>	eP L F	5	13	12 18 32 28					
41	31	I <sub>u</sub>	e F	13	37	12 15 20					From Omori's seis- mograph. NW San Francisco Califor- nia.

FEBRUARY, 1922.

42	4	I <sub>v</sub>	eP F	6	16	54 20					
43	5	I	e F	3	44	22 4 18					
44	6	I <sub>v</sub>	eP F	16	18	32 21					

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks.
				h.	m.	s.		AN	AE		
				s.			μ	γ	Kms.		
45	9	I	e F	15	51	50					
46	10	I	e F	12	21	32					
47	11	I	e F	13	54	49					
48	11	I	e F	14	54	45					
49	14	Ir	eP L F	12	55	39					
50	15	I	e F	4	48						
51	15	I	e F	8	22	44					
52	15	I	e F	14	36						
53	15	Iv	eP F	22	54	33					Felt at Batag (N Samar).
54	16	I	e F	3	38						Nicaragua earthquake.
55	16	I	e F	4	47						
56	18	Iv	eP F	0	25	35					
57	19	Iv	eP F	7	05	02					
58	19	I	e F	21	23	26					
59	20	I	e F	7	55	42					
60	22	I	eP F	17	24	35					
61	23	Ir	eP L? F	15	55	51					
62	23	Iv	eP F	23	21	04					
63	25	Iv	eP F	13	06	27					
64	26	I	e F	9	03	28					
65	27	IIv	eP L MN1 ME1 MN2 ME2 F	20	41	09					
				42	11				550		Felt in Cebu Is-land with intensity V-VI.
				43	00		6	395			
				43	04		6		285		
				44	09		5	445			
				44	29		6		328		
				21	52						
66	28	Iv	eP L F	1	14	18					
				15	17				540		Aftershock of the No. 65.
				21							

Year 1922, No. 5.

March 1st to 12th, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

$\phi=14^{\circ} 34' 41''$  N.;  $\lambda=120^{\circ} 58' 33''$  E.  $h=2.40$ ms. Alluvium.

Instrument: Wiechert's astatic Pendulum (1,000 Kgs.)

	$T_0$	$\epsilon$	$\frac{r}{T_0^2}$
$A_N$ :	6.25	2,906	0.053
$A_E$ :	6.18	2,393	0.042

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		$A_N$	$A_E$		
				s.			$\mu$	$\mu$	Kms.		
67	1	$I_v$	eP L ME MN F	9	10	23 11 32 12 03 12 13 40					SE Negros Island.
							7 6	54	41		
68	1	$I_v$	eP F	9	42	42 55					
69	4	$I_v$	eP F	2	25	21 30					
70	4	$I_r$	eP L F	5	19	12 23 11 48					
71	4	$II_r$	i iS L ME1 MN1 MN2 ME2 F	13	16	02 20 30 22 35 22 39 22 46 24 51 25 23 14 45					
							8 9 9 7	184 182	139 208		
72	6	$I_r$	eP L F	21	29	24 35 48 58					
73	7	$I_r$	e L F	16	53	14 17 02 00 47					
74	7	$I$	e F	22	27	54 49					
75	10	$II_v$	eP L ME MN F	4	57	32 57 48 57 50 58 12 5 11					
							4 5	149	110		
76	10	$I_r$	e S L F	17	02	45 08 23 11 21 18 04					
77	12	$I_u$	e? F	18	16	19 32					

Year 1922, No. 6.

March 12th to April 8th, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>		
							s.	$\mu$	$\mu$	Kms.	
78	13	Iv	eP F	21	48	12					Felt at Calatagan (SW Luzon).
79	14	II <sub>d</sub>	eP L F	15	12	00 12 17					
80	16	Iv	eP F	5	02	30 20					Felt in the North-western coasts of Samar.
81	16	Iv	eP F	5	46 57	04					Felt in the Ilocos Norte Province.
82	17	I	e F	13	18 30						
83	17	I	e F	17	28 53						
84	17	II <sub>v</sub>	eP L MN ME F	21	04 05 05 05	19 50 55 55 22	7 5	140	166		
85	28	Ir	e L F	4	17 23 58 49 5	28					
86	29	I	ME F	7 8	58 11						

APRIL, 1922.

87	2	I	e F	3	19 54	38					
88	2	I <sub>u</sub>	e S L F	19	29 37 49	00 30 16					
89	3	I	e F	19	50 20	30					
90	5	III <sub>r</sub>	eP eS iL MN ME F	10	04 09 11 12 13	37 25 49 00 38 12	8 8	200	236		
91	5	Iv	eP L MN ME F	13	42 42 43 43 49	30 48 11 11 49	2 2	118	61		
92	7	II <sub>v</sub>	eP L MN ME F	16	00 02 02 03 17	42 25 51 12 08	7 7	100	57		
93	8	Iv	eP F	0	49 56	41					

Year 1922, No. 7.

April 8th to 22nd, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>		
94	8	I <sub>r</sub>	eP L? F	3	38	42		γ	γ		
					45	20					
				4	45						
95	8	I <sub>u</sub>	e L? F	20	55	38					
				21	24	10					
				23	42						
96	10	I	e F	3	15						
					35						
97	10	I <sub>r</sub>	e L? F	4	04	09					
					10	17					
					42						
98	11	I <sub>r</sub>	e F	0	28	15					
				1	24						
99	11	I	e F	15	53	22					
				16	11						
100	13	II <sub>v</sub>	eP L ME MN F	6	09	13					
					10	39					S Samar and NE Mindanao.
					11	25	7				
					11	36	7	147	59		
				7	12						
101	15	I <sub>v</sub>	eP F	0	46	02					
				1	02						NW Luzon.
102	15	I <sub>v</sub>	eP L F	7	37	34					
					37	55					
					41						
103	16	I <sub>v</sub>	eP F	21	09	45					
					12						
104	16	I <sub>v</sub>	eP F	23	56	51					
					59						
105	17	I <sub>v</sub>	eP F	2	17	26					
					27						
106	17	I <sub>v</sub>	eP L F	19	22	31					
					23	35					Samar Island.
					32						
107	17	III <sub>v</sub>	eP iL	21	28	55					
					29	12					NE Mindoro. Maxima and end lost by the force of the shock.
108	18	I <sub>v</sub>	eP F	5	16	39					
					19						
109	19	I <sub>v</sub>	eP L F	19	58	11					
					58	51					
				20	14						
110	20	I	e F	13	26						
				14	08						
111	22	I	eP F	10	17	00					
					19	08					
					37						

Year 1922, No. 8.

April 22nd to 30th, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY, --Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		AN	AE		
112	22	I	e F	21	06						
113	23	IIIv	eP L MN F	21	31	38	8	1182			SE Luzon and Visa- yas.
114	23	Iv	eP L F	22	07	17					Aftershock of the No. 113.
115	24	Iv	eP F	5	34	08					
116	24	Iv	eP F	9	55	04					
117	25	Iv	eP F	8	47	40					
118	25	Ir	e L MN	21	28	35					End overtaken by following earth- quake.
119	25	Ir	e L MN F	21	49	26	7	56			
120	26	Ir	eP eS eL MN ME F	1	17	30	8 8	53	74		Earthquake of Japan
121	26	Ir	e L? F	4	07	14					
122	26	Iv	eP F	19	19	23					
123	27	I	eP F	9	22	47					
124	27	I	e F	18	25	41					
125	28	I	e F	6	45	17					
126	28	I	e F	13	14	28					
127	30	IIv	eP L Me MN F	22	19	51	5 5	309	254		N Luzon.



Year 1922, No. 9.

May 1st to 8th, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

$\phi=14^{\circ} 34' 41''$  N.  $\lambda=120^{\circ} 58' 33''$  E.  $h=2.40$  ms. Alluvium.

Instrument: Wiechert's astatic Pendulum (1,000 Kg.)

	$T_0$	$\epsilon$	$\frac{r}{T_0^2}$
$A_N$	6.25	2.906	0.053
$A_E$	6.18	2.393	0.042

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks.
				h.	m.	s.		$A_N$	$A_E$		
							$\mu$	$\mu$	Km.		
128	1	I	e F	11	04						
129	1	Iv	eP F	21	18	45				140	Felt at Baguio and Dagupan (W Luzon).
130	2	Iv	eP F	7	39	04				125	
131	2	IIr	eP L ME MN F	11	15	49				1710	
					19	40	10				
					20	04	10	94	123		
					20	37					
					12	22					
132	4	Iu	e F	9	20	44					Kurile Islands.
					11	25					
133	5	I	e F	0	27						
					58						
134	5	Iv	eP F	1	03	24					
					08						
135	5	Ir	eP L F	14	49	00				1640	
					52	37					
					15	23					
136	5	Iv	eP L	21	41	45				200	End overtaken by following Eqke.
					42	07					
137	5	Iv	eP F	21	43	46				190	
					47						
138	5	Iv	eP F	22	43	45				240	
					50						
139	6	I	e F	12	28	26					
					13	08					
140	6	I	e F	16	52	15					
					17	06					
141	6	I Iv	eP F	21	21	00				620	
					30						
142	7	Iv	eP F	3	56	10				160	
					59						
143	7	Iv	eP L MN F	9	56	37				450	Felt in western part of Samar I.
					57	27					
					57	49					
					10	14					

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks.
				h.	m.	s.		AN	AE		
	May						s.	$\mu$	$\mu$	Km.	
144	9	Iv	eP F	9	55	07					
145	9	Ir	eP L? F	13	23	43					
146	9	IIr	eP	13	55	41					
			L		59	07					
			ME	14	01	04	9		314		
			MN F		01	37	8	158			
			F		57						
147	9	Iv	eP F	19	12	47					
			F		28						
148	10	Ir	eP	9	25	20					
			L		29	26					
			ME		30	58	7		70		
			MN F		31	30	7	49			
			F		48						
149	10	I	e F	16	37						
			F		52						
150	11	I	e F	9	25	27					
			F	10	31						
151	12	Iv	eP F	8	42	27					
			F		55						
152	12	I	e F	13	25						
			F		45						
153	12	I	e	18	49	25					
154	12	Iv	eP F	20	04	00					
			F		23						
155	13	Iv	eP F	13	25	50					
			F		33						
156	15	Iv	eP F	2	25	29					
			F		36						
157	15	I	e F	20	28	00					
			F	21	13						
158	16	Iv	eP F	2	21	12					
			F		32						
159	16	IIIv	eP	8	08	14				560	
			L		09	16					
			MN		10	08	4	533			
			ME		10	20	4		573		
			F								
160	16	Iv	eP L F	8	49	12					
			L		50	08					
			F	9	32						
161	18	I	e F	0	02	10					
			F		17						
162	18	I	eP F	13	14	55					
			F		50						
163	20	Iv	eP	17	11	55				325	
			L		12	30					
			F		22						

End overtaken by following Eqke.

Felt in northern part of Luzon. End overtaken by following earthquake.

Felt at Naga (SE Luzon).

Year 1922, No. 11.

May 20th to June 2nd, 1922.

M A N I L A, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		AN	AE		
				h. m. s.			s.	μ	μ	Km.	
164	20	Iv	eP F	17	37	04 45					
165	21	Ir	eP L F	5	13	31 16 58					
166	22	Iv	eP F	12	33	46 37					
167	22	I	e F	18	07	00 19 10					
168	23	Iv	eP F	13	40	18 42					
169	24	I	e F	8	08	41 41					
170	24	Iv	eP L ME F	15	25	20 26 27 45				750	Felt in Samar and Cebu Islands and NE Mindanao.
171	26	IIId	eP L MN ME F	15	44	43 44 57 45 01 45 03 16 00	4 4	439	318	125	Felt at Atimonan (E Luzon).
172	27	Iv	eP F	23	56	57 58				70	
173	29	Ir	e L F	20	30	13 32 55 47					
174	30	I	e F	18	38	35 51					
175	31	Iv	eP F	7	15	29 18				190	
176	31	Iv	eP F	7	19	09 26				120	
177	31	Iv	eP F	9	56	35 10 00				170	

J U N E , 1 9 2 2 .

178	1	IIv	eP L ME MN F	16	19	43 20 43 21 54 22 20 54	4 4	101	86		
179	2	Iv	eP F	11	48	58 54					
180	2	Iv	eP L F	16	30	07 30 29 38				200	

Year 1922, No. 12.

June 2nd to 23rd, 1922.

M A N I L A , P . I .

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY,--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		AN	AE		
181	2	III <sub>r</sub>	eP	20	14	10	10	936	768	130	Felt at Datuan (N Mindanao).
			S		16	45					
			L		18	05					
			MN		18	35					
			ME		18	40					
		F	22	42	10						
182	3	I	eF	1	29	46					
			F	2	00						
183	3	I	eF	5	03						
			F		31						
184	4	Iv	eP	12	23	09				130	
			F		29						
185	4	Iv	eP	16	20	22				420	NW Luzon.
			F		27						
186	4	Iv	eP	21	26	55				410	NW Luzon.
			F		32						
187	5	Iv	eP	9	53	47				390	SE Luzon.
			L		54	30					
			F	10	23						
188	5	I	eF	14	11	00					
			F	15	02						
189	6	Iv	eP	2	35	27				190	
			F		39						
190	6	I	eF	6	56						
			F	7	08						
191	6	I	eF	11	05						
			F		19						
192	8	Iv	eP	21	33	48	6	66	54	530	
			L		34	46					
			MN		35	15					
			ME		36	02					
			F		54						
193	12	I	eF	5	09						Very distant earth-quake.
			F	7	04						
194	12	Iv	eP	12	31	01				120	
			F		37						
195	17	Ir	eP	2	38	00					
			L?		40	48					
			F	3	57						
196	17	Iv	eP	12	13	35				170	
			L		13	54					
			F		19						
197	18	Iv	eP	12	26	31					
			F		35						
198	19	Iv	eP	23	03	31				125	
			F		06						
199	22	Iv	eP	13	20	41				210	
			L		21	04					
			F		30						

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.---Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks.
				h.	m.	s.		AN	AE		
200	24	I <sub>r</sub>	eP S L MN ME F	16	29	51 31 38 32 03 32 36 33 34	7 7	40	47	1010	Felt at Zamboanga (W Mindanao).
201	24	I <sub>v</sub>	eP F	18	28	33 31				130	
202	24	I	e F	22	11	20					
203	24	I <sub>v</sub>	eP F	23	09	40 18					
204	26	I <sub>v</sub>	eP F	19	18	27 22				120	
205	26	I <sub>v</sub>	eP	21	56	09				120	End overtaken by following lqke.
206	26	I <sub>v</sub>	eP F	21	58	22 22 02				120	
207	27	III <sub>r</sub>	eP S L MN1 ME1 MN 2 ME2 F	14	32	14 35 10 36 06 37 38 38 19 38 32 39 52 16 22	7 9 8 9	360 366	308 306		Felt at Butuan (N Mindanao).
208	29	I	e F	4	54	42 5 28					
209	29	I <sub>v</sub>	eP F	7	28	34 34				160	
210	29	II <sub>v</sub>	eP L MN ME F	20	55	55 57 12 57 19 57 28 22 02	7 6	657	679		Felt in northern part of Luzon.

J U L Y , 1 9 2 2 .

211	1	I <sub>v</sub>	eP F	2	21	25 25				150	
212	1	I <sub>v</sub>	eP L F	20	13	44 14 53 25				600	Felt at Laoag (NW Luzon).
213	2	I <sub>r</sub>	e L MN ME	13	32	04 34 21 34 25 34 42	7 8	36	30		End overtaken by following Eqke.
214	2	I <sub>u</sub>	e? L? MN ME F	13	47	36 14 11 15 11 32 12 08 15 47	22 20	10	7	7950?	

Year 1922, No. 14.

July 3rd to 18th, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		$\mu_N$	$\mu_E$		
							s.	$\mu$	$\mu$	Km.	
215	3	I	e F	5	39	39					
				6	41						
216	3	Iv	eP L F	13	45	00				600	
				14	06	07					
217	5	Iv	eP F	14	48	51					From Omori's seis- mograph.
					59						
218	8	Iv	eP F	21	24	34					From Omori's seis- mograph.
					28						
219	9	Ir	eP L F	9	43	02				1420	
					45	31					
				10	17						
220	10	I	e F	10	02	37					
					39						
221	11	Ir	e L? F	14	18	00				2100?	
					22	48					
				15	08						
222	12	Iv	eP F	19	52	47					
					55						
223	13	IIIr	eP S L ME MN F	5	00	06				2350	Felt in northern and southeastern part of Mindanao.
					03	56					
					05	36					
					06	10	8		440		
					06	28	9	631			
				6	48						
224	13	I	e F	10	51	14					
				11	18						
225	13	Iv	eP F	13	47	56					
					56						
226	13	Iv	eP F	21	12	30					
					42						
227	14	I	e F	3	32	50					
					00						
228	14	I	e F	9	27						
					42						
229	16	Iv	eP F	23	11	13				225	From Vicentini's Seismograph.
					15						
230	17	Iv	eP F	4	05	40					
					12						
231	17	IIv	eP L MN ME F	21	17	07				450	Felt in southwest- ern part of Panay and in Cuyo Islands
					17	57					
					19	14	7	204			
					19	40	7		217		
				22	04						
232	18	Ir	eP L F	22	15	46				1220	
					18	27					
					34						

Year 1922, No. 15.

July 19th to 31st, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY,--Continued.

No.	Date	Char-acter	Phase	Greenwich Per-iod.				Amplitude		Dis-tance.	Remarks.
				mean	time	s.	s.	AN	AE		
				h.	m.	s.	s.	μ	μ	Km.	
233	19	Ir	eP L F	12	57	17				1020	
234	19	IIv	eP L ME MN F	16	33	07				590	
							5		237		
							5	189			
235	20	I	e F	8	38						
				9	05						
236	21	Iv	eP F	0	44	50					
					49						
237	21	Iv	eP F	6	45	03				150	
					48						
238	22	I	e F	4	18						
					37						
239	25	Iv	eP F	13	28	37					Felt in northern part of Mindanao.
					35						
240	25	IIv	eP L MN ME F	22	18	24				320	
					19	00					
					19	28	4	414			
					19	32	5		349		
					43						
241	28	Iv	eP L? F	7	32	35				900?	
					34	20					
					48						
242	28	IIIId	eP L MN ME	18	53	43				320	Felt in western part of Luzon. End lost by the force of the shock.
					54	09					
					54	11	4	843			
					54	11	4		759		
243	29	Iv	eP L F	13	11	49				210	
					12	12					
					24						

Year 1922, No. 16.

August 1st to 16th, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

$\phi=14^{\circ} 34' 41''$  N.  $\lambda=120^{\circ} 58' 33''$  E.  $h=2.40$  ms. Alluvium.

Instrument: Wiechert's astatic Pendulum (1,000 Kgs.)

	$T_0$	E	$\frac{F}{T_0^2}$
$A_N$	6.25	2.906	0.053
$A_E$	6.18	2.393	0.042

No.	Date	Character	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		$A_N$	$A_E$		
							s.	$\mu$	$\mu$	Kms.	
244	2	I	e F	1	32	47					
245	5	I <sub>v</sub>	eP F	10	11	08 19					
246	6	I <sub>r</sub>	e F	1	02	47 09 00 2 03					
247	7	I <sub>v</sub>	eP F	0	59	05 1 06					
248	7	I <sub>r</sub>	e F	12	31	12 14 08					
249	9	I	e F	6	22	46 45					
250	10	II <sub>v</sub>	eP L M N F	11	57	18 34 36 40 12 04	4 4	330	311		
251	10	I <sub>v</sub>	eP L F	20	39	00 06 41					
252	11	I	e F	8	41	10 46					Asia Minor, Turkey.
253	11	I	e F	13	48	15 02					
254	11	I <sub>v</sub>	eP F	19	43	35 20 04					
255	13	I <sub>u</sub>	e S? L? M N F	0	22	40 33 06 52 00 55 35 56 24 2 03	29 30	7	5		SW coast Norway.
256	14	I <sub>r</sub>	eP L F	11	48	53 02 12 27					
257	16	I <sub>r</sub>	e L F	6	29	37 33 39 52					



SEISMOLOGICAL BULLETIN OF THE OBSERVATORY--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks
				h.	m.	s.		N	E		
258	16	I <sub>v</sub>	eP F	10	51	20					
259	16	I <sub>r</sub>	eP	16	05	17					
			L? F	12 17	25 33						
260	18	I <sub>v</sub>	eP	7	29	48					Felt in Romblon I.
			L	30	15						
			F	40							
261	20	I <sub>v</sub>	eP	3	18	18					From Omori's Seismograph.
			F	29							
262	20	I <sub>v</sub>	eP	14	24	50					From Vicentini's seismograph.
			L	25	16						
			F	30							
263	23	I <sub>r</sub>	e	15	26	11					
			F	52							
264	25	I <sub>r</sub>	e	11	52	18					
			L?	12	02	36					
			F	31							
265	25	I <sub>u</sub>	e	19	38	17					
			L	54	00						
			M <sub>N</sub>	55	24	13	39				
			M <sub>E</sub>	56	02	13		22			
			F	20	28						
266	25	I <sub>r</sub>	e	2	31	12					
			L	34	57						
			F	47							
267	27	I <sub>v</sub>	eP	15	41	01					
			F	43							
268	27	I <sub>v</sub>	eP	21	16	23					Felt at Zamboanga and Cotabato (W Mindanao). From Vicentini's seismograph.
			L	17	52						
			F	24							
269	29	I <sub>v</sub>	eP	10	43	05					Felt at Naga (SE Luzon).
			F	48							
270	29	III <sub>d</sub>	iP	17	01	48					SW Tablas Island. Maxima and end lost by the force of the shock.
			iL	02	22						
271	29	I <sub>v</sub>	eP	17	32	09					From Vicentini's seismograph. Aftershock of the No. 270.
			F	37							
272	29	I <sub>v</sub>	eP	17	41	55					Ditto.
			F	45							
273	29	I <sub>v</sub>	eP	17	55	02					Ditto.
			F	57							

Year 1922, No. 18.

August 29th to 31st, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks.
				h.	m.	s.		$\mu$	$\mu$		
274	29	Iv	eP F	18	18	38 23				From Vicentini's seismograph. Aftershock of the No. 270.	
275	29	Iv	eP F	20	29	06 35				Ditto.	
276	29	IIv	eP IL F	22	36	54 37 36 49				Ditto.	
277	29	Iv	eP F	22	54	59 59				Ditto.	
278	30	Iv	eP F	2	28	34 33				Aftershock of the No. 270.	
279	30	Iv	eP F	3	43	07 50				Ditto.	
280	30	Iv	eP F	5	21	05 24				Ditto.	
281	30	Iv	eP F	5	33	59 37				Ditto.	
282	30	IIr	e L? M N F	10	30	36 34 11 35 05 11 23 14	9 9	99	52	Felt at Cotabato, Zamboanga and Lais (Mindanao Island).	
283	30	Iv	eP F	15	06	45 10				Aftershock of the No. 270.	
284	30	Iv	eP F	17	24	01 27					
285	31	Iv	eP F	3	10	48 16				Ditto.	
286	31	Iv	eP F	3	57	52 01					
287	31	Iv	eP F	8	39	32 43				Ditto.	
288	31	Iv	eP F	17	44	43 59				Ditto.	
289	31	Iv	eP F	20	31	47 34					

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

$\phi=14^{\circ} 34' 41''$  N.  $\lambda=120^{\circ} 58' 33''$  E.  $h=2.40$  ms. Alluvium.

Instrument: Wiechert's astatic Pendulum (1,000 Kgs.)

	$T_0$	$C$	$\frac{F}{T_0^2}$
$A_1$	6.94	2.212	0.048
$A_2$	6.90	1.797	0.043

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks.
				h.	m.	s.		$\mu$	$\mu$		
290	1	I <sub>v</sub>	eP F	3	57	30 03					
291	1	III <sub>r</sub>	iP iS iL MN1 MN2 ME1 ME2 MN3 ME3 MN4 ME4 C F	19	18	25 50 49 29 40 31 27 14 44 36 02 06 49		10 10 10 10 10 10 12 13 12 10	417 398 304 271 381 298 393 210	1100	NE Formosa. Felt at Baguio (W Luzon).
292	2	II <sub>r</sub>	eP L MN ME F	17	27	16 06 35 51 04		5 6	51 35		
293	2	I <sub>r</sub>	e L? F	23	56	05 09 12					
294	3	I <sub>r</sub>	eP F	2	15	02 26					
295	3	I <sub>v</sub>	eP F	14	40	52 46					
296	4	I <sub>r</sub>	e F	2	39	29 18					Felt at Butuan and Lais (Mindanao I.)
297	4	I <sub>v</sub>	eP F	15	46	27 50					
298	4	I	e F	17	23	48					
299	4	I <sub>r</sub>	e L F	17	56	28 40 58				1860	W Formosa

Year 1922, No. 20.

September 5th to 11th, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY. Continued.

No.	Date.	Char-acter.	Phase.	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		$\mu$	$\mu$		
300	5	I	e F	7	11						
					37						
301	6	Iv	eP L F	13	40	45				830	Felt at Surigao, Butuan and Zam- bajao.
					42	17					
					57						
302	6	Ir	e L F	22	15	12				1200	NE Formosa.
					17	21					
					23	20					
303	7	Iv	eP F	14	27	34					
					33						
304	7	Iv	eP L F	18	15	53				560	Felt at Cape Bo- jeador (NW Luzon).
					16	55					
					30						
305	7	Iv	eP F	18	50	08					
					55						
306	8	Ir	e F	14	23	52					
					15	23					
307	8	Iv	eP F	20	45	00					
					49						
308	10	Iv	eP L M M F	14	51	28					
					51	43					
					51	56	3		32		
					52	17	3	37			
					59						
309	11	Iv	eP L F	3	05	48				240	
					06	15					
					14						
310	11	Iv	eP L F	12	58	47				240	
					59	14					
					13	09					
311	11	IIr	eP S L M M F	14	48	03				1440	N Celebes.
					50	40					
					51	18					
					51	31	6		84		
					52	40	5	109			
					15	57					
312	11	Ir	eP L F	16	26	21				1360	N Celebes.
					29	22					
					52						
313	11	Iv	eP F	18	12	22					
					16						

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks
				h.	m.	s.		AN	AE		
				s.			$\mu$	$\mu$	Kms.		
314	12	Iv	eP L F	14	31	56				320	
					32	32					
					38						
315	14	Iv	eP L F	6	16	00				90	
					16	10					
					18						
316	14	IIIr	eP L	19	34	02				1200	NE Formosa.
			MN1		36	40	10	175			
			ME1		38	55	10		188		
			MN2		39	37	11	194			
			ME2		40	23	10		240		
			F		42	00					
					21	26					
317	16	Iv	eP F	20	04	47					
					09						
318	16	IIr	eP L	22	47	04				1100	NE Formosa.
			ME		49	29	8		113		
			MN		51	45	10	133			
			F		52	00					
					23	55					
319	17	IIr	e L	7	25	35				1300	N Formosa. End overtaken by following earthquake.
					27	35					
320	17	IIr	e L F	7	56	50				1800	N Formosa.
					8	00					
					26	52					
321	17	IIr	eP L	10	01	35				1500	N Formosa.
			ME		04	55	9		93		
			F		05	16					
					11	08					
322	18	I	eP F	6	22	04					N Formosa. From Omori's seismograph.
					50						
323	20	Iv	eP L F	22	23	32				435	Felt at Aparri and Vigan (N Luzon).
					24	20					
					27						
324	21	Iv	eP L F	15	21	13				210	From Vicentini's seismograph.
					21	36					
					27						
325	22	Iv	eP L F	4	45	33				140	
					45	49					
					49						
326	25	Iv	eP L F	5	44	23				170	
					44	42					
					48						
327	26	Iv	eP L F	14	14	19				140	
					14	35					
					17						
328	28	I	eP F	22	06	40					N Formosa.
					44						

Year 1922, No.22.

October 1st to 14th, 1922.

M A N I L A, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

$\phi=14^{\circ} 34' 41''$  N.  $\lambda=120^{\circ} 58' 33''$  E.  $h=2.40$  ms. Alluvium.

Instrument: Wiechert's astatic Pendulum (1,000 Kgs.)

	$T_0$	E	$\frac{r}{T_0^2}$
$A_N$	6.94	2.212	0.048
$A_E$	6.90	1.787	0.043

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		$A_N$	$A_E$		
329	3	I <sub>r</sub>	e	12	09	03				1380?	Felt at Butuan (Mindanao).
			L?		12	15					
			F	13	02						
330	3	I	e	13	21						
			F		38						
331	3	I	e	13	44						
			F		59						
332	3	I <sub>v</sub>	eP	20	57	28				100	
			L		57	39					
			F	21	00						
333	3	I <sub>v</sub>	eP	21	27	19				90	
			L		27	29					
			F		31						
334	4	I <sub>v</sub>	eP	4	41	14				140	
			L		41	30					
			F		45						
335	5	II <sub>r</sub>	eP	5	17	10					
			L		20	05					
			M		20	11	7	75			
			M		20	37	8		42		
			F	6	03						
336	5	II <sub>v</sub>	eP	11	54	42				420	Felt in northern part of Luzon.
			L		55	23					
			M		56	22	6		67		
			M		56	27	5	48			
			F	12	09						
337	11	I <sub>u</sub>	eP	15	10	21					Between Manila and Penang
			M		15	00					
			M		15	51					
			eS?		21	15					
			L?		40	23					
			F	17	05						
338	14	III-	eP	0	15	59				490	Felt in northwest-ern part of Luzon.
			L		16	53					
			M		17	30	6	457			
			M		17	21	6		317		
			F		50						

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>		
539	14	II <sub>2</sub>	eP L III <sub>2</sub> F	3	59	00			1550	NE Formosa.	
				4	02	25					
				05	21		8		20		
				5	15						
340	14	I	e F	7	41	40					
				8	56						
341	14	III <sub>2</sub>	eP L F	23	49	40			1600	N Formosa.	
				53	08						
				1	50						
542	16	I <sub>u</sub>	eP L? F	16	08	49			5220?		
				23	55						
				17	10						
343	17	II <sub>2</sub>	e iL M <sub>N</sub> M <sub>E</sub> F	6	43	22					
				51	34						
				55	00		10	70			
				55	17		10		30		
				7	50						
344	17	I <sub>r</sub>	e L M <sub>N</sub> M <sub>E</sub> F	10	02	00					
				10	23						
				11	52		12	13			
				11	53		11		9		
				55							
345	17	I <sub>r</sub>	e L F	17	55	12					
				18	00	30					
				31							
346	17	I	e F	21	20	42					
				48							
347	18	I	e F	13	04	46					
				24							
348	18	I	e F	22	45	00					
				23	02						
349	20	I <sub>v</sub>	eP L F	1	14	16			320		
				14	52						
				19							
350	20	I <sub>v</sub>	eP L F	13	21	31			170	Felt at Atimonan (E Luzon).	
				21	50						
				28							
351	21	I <sub>v</sub>	eP F	20	24	45			50		
				28							
352	21	I <sub>v</sub>	e L F	22	07	50			720		
				09	20						
				28							

Year 1922, No. 24.

October 22nd to 31st, 1922.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks.
				h.	m.	s.		s.	A <sub>N</sub>		
								) <sup>u</sup>	) <sup>u</sup>	Fms.	
353	22	I <sub>v</sub>	eP F	17	33	56				90	
354	23	I <sub>v</sub>	eP	3	31	40				500	Felt at Aparri (NE Luzon).
			L		32	35					
			M <sub>N</sub>		32	49	5	19			
			M <sub>E</sub> F		33	40	5		17		
				43							
355	24	II	e F	21	28	43					
356	24	I <sub>v</sub>	eP	23	23	49				180	Felt at Boac (Marinduque Island).
			L		24	09					
			F		32						
357	27	III <sub>r</sub>	eP	14	25	00				1350	
			iL		27	52					
			M <sub>E</sub>		29	04	9		63		
			M <sub>N</sub> F		29	50	8	67			
				16	12						
358	29	I <sub>v</sub>	eP	13	55	26				210	
			L		55	49					
			F		14	03					
359	29	I <sub>v</sub>	eP	20	47	17				125	Felt at Baguio (W Luzon).
			L		47	31					
			F		51						
360	30	I <sub>r</sub>	eP	13	10	32					
			L		14	34					
			M <sub>E</sub>		14	41	6		16		
			M <sub>N</sub>		14	48	8	41			
			F		58						



MANILA, 1922.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.

$\phi=14^{\circ} 34' 41''$  N.  $\lambda=120^{\circ} 58' 33''$  E.  $h=2.40$  ms. Alluvium.

Instrument: Wiechert's astatic Pendulum (1,000 Kgs.)

	$T_0$	$\epsilon$	$\frac{\epsilon}{T_0^2}$
$A_N$	6.94	2.212	0.048
$A_E$	6.90	1.787	0.043

No.	Date	Char-acter	Phase	Greenwich mean time		Per-iod.	Amplitude		Dis-tance.	Remarks.
				h. m. s.	s.		$A_N$	$A_E$		
							$\mu$	$\mu$	Kms.	
361	3	II <sub>r</sub>	eP	12	55	06			1740	
			eS		58	10				
			iL		59	00				
			M <sub>N</sub>		59	10	8	63		
			M <sub>E</sub>		59	10	7	82		
			F	13	27					
362	4	I	e	18	21	39				
			F		45					
363	7	I <sub>r</sub>	eP	17	05	42			1560	Felt at Zamboanga (W Mindanao).
			L		09	15				
			M <sub>E</sub>		09	50	10	3		
			M <sub>N</sub>		10	00	10	15		
			F	18	02					
364	7	I <sub>r</sub>	eP	18	21	15				
			L		26	42				
			F	19	04					
365	7	I <sub>u</sub>	e	23	20	17				Very distant earth-quake.
			F	1	18					
366	9	I <sub>r</sub>	eP	2	07	05			1290?	
			L		10	00				
			M <sub>E</sub>		10	15	9	15		
			M <sub>N</sub>		10	45	8	26		
			F	3	08					
367	10	III <sub>v</sub>	eP	12	30	15			550	Felt in northern part of Luzon.
			L		31	15				
			M <sub>N</sub>		31	39	5	169		
			M <sub>E</sub> 1		32	04	5	130		
			M <sub>E</sub> 2		34	20	8	181		
			F	53						
368	11	III <sub>u</sub>	eP	4	52	42			17000?	Chilean earthquake.
			eL?	5	51	00				
			M <sub>E</sub> 1		52	40	22	46		
			M <sub>N</sub> 1		53	25	31	34		
			M <sub>E</sub> 2		55	24	29	47		
			M <sub>N</sub> 2		59	58	30	34		
			M <sub>E</sub> 3		6	01	00	27		
M <sub>N</sub> 3		9	01	42	30	14				
			F	9	50					

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			iod.	Amplitude		Dis-tance,	Remarks
				h.	m.	s.		A <sub>N</sub>	A <sub>E</sub>		
369	11	Iv	eP F	18	19	28 21				140	
370	11	I	e F	18	30	20 27					
371	16	Iv	eP L M L F	10	13	17 18 34 37 48	6 6	30	25	550	Visayan earthquake.
372	16	Iv	eP F	12	19	09 22				225	
373	17	Iu	e F	11	23	13 40					Very distant earth-quake.
374	17	Iv	eP F	21	55	02 58				270	
375	18	Ir	eP L? F	19	00	00 05 19				2310?	
376	19	Iv	eP F	7	39	38 57				800	
377	23	Iv	eP L F	2	23	00 48 41				435	
378	24	Iv	eP F F	5	43	42 02 11				730	From Omori's seis-mograph.
379	25	Iv	eP F F	16	54	55 59 02				490	From Vicentini's seismograph.
380	26	Iv	eP F	3	12	00 15				90	
381	26	Iv	eP F F	13	00	45 22 16				330	
382	29	Ir	eP F F	15	40	30 43 58				1020	Felt in the south-ern part of Mindanao.
383	29	Iv	eP F	17	51	57 54				120	
384	30	Iv	eP L F	17	42	09 21 47				120	Calapan (Mindoro).

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SEISMOLOGICAL BULLETIN OF THE ...

$\phi = 14^{\circ} 34' 41''$  N.  $\lambda = 120^{\circ} 53' 55''$  E.  $h = 2.40$  m. Alluvium.

Instrument: Woodworth's astatic Pendulum (1,000 Kgs.)

	$T_0$	$\epsilon$	$\frac{r}{T_0^2}$
$A_{EP}$	6.94	2.212	0.043
$A_{EP}$	6.20	1.787	0.043

No.	Date	Char-acter	Phase	Greenwich mean time		Per-iod.	Amplitude		Dis-tance.	Remarks.
				h.	m.		s.	$A_{EP}$		
385	2	II	eP F	3	49	18				
386	3	I	e F	16	47	36				
387	4	Iv	eP iL eL eP F	3	55	40			100	Felt in the west- ern part of Luzon.
388	5	Iv	eP L F	12	50	11			240	Felt in the north- eastern part of Mindanao.
389	6	II	eP F	14	04	03				
390	7	IIr	e L eP eL F	16	54	49				
391	7	I	e F	22	29	45				
392	8	Iv	eP L eP eL F	2	06	46				
393	8	Iv	eP L F	22	29	51			230	Felt at Butuan (M Mindanao).
394	8	Iv	e F	22	39	55				
395	10	I	e F	2	51					
396	10	Iv	eP L F	9	56	44			570	

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MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time			Per-iod	Amplitude		Dis-tance	Remarks
				h.	m.	s.		$\mu$ <sub>N</sub>	$\mu$ <sub>E</sub>		
397	10	I <sub>r</sub>	eP L F	21	25	21 28 47					
398	10	I <sub>v</sub>	eP F	21	54	49 57			130		
399	10	I <sub>v</sub>	eP L F	23	05	48 06 30 16			380	Felt at Legaspi (SE Luzon).	
400	12	I <sub>v</sub>	eP F	17	01	47 12			500		
401	13	I <sub>v</sub>	eP F	0	55	14 59			170		
402	13	I <sub>v</sub>	eP F	5	08	51 21			630		
403	13	I <sub>r</sub>	e F	14	07	21 41					
404	14	I <sub>r</sub>	eP F	23	10	26 11 39					
	15		F	0	57						
405	16	I <sub>r</sub>	e L F	10	45	26 50 00 11 40					
406	17	I <sub>r</sub>	e F	1	00	00 38					
407	18	I <sub>v</sub>	eP F	12 13	54 07	40					
408	20	II <sub>v</sub>	eP L F	19	48	32 49 14 54			380	From Vicentini's seismograph.	
409	21	I <sub>r</sub>	eP L F	14	05	07 07 48 29			1260		
410	21	I <sub>r</sub>	eP L F	14	13	10 13 34 13			220		
411	22	I <sub>r</sub>	eP L F	17	21	42 22 31 30			240		
412	22	I <sub>r</sub>	eP	23	50	00 51 51			1020		
	23			0	18						
413	23	I	e	22	17	49					

Year 1932, No. 39.

Dec. 1st to 31st, 1932.

MANILA, P. I.

SEISMOLOGICAL BULLETIN OF THE OBSERVATORY.--Continued.

No.	Date	Char-acter	Phase	Greenwich mean time		Per-iod	Amplitude		Dis-tance	Remarks.
				h. m. s.	s.		$\mu$	$\mu$		
414	24	I <sub>r</sub>	eP L	0 16 04						
				21 08						
415	25	I <sub>v</sub>	eP F	2 24 52					110	
				27						
416	25	I	e F	3 45						
				4 38						
417	25	I <sub>r</sub>	eP L	11 37 00						
				56						
418	27	I <sub>v</sub>	eP L II III F	20 44 31					670	
				45 44						
				46 37	6		33			
				47 05	6	63				
				21 00						
419	31	II <sub>u</sub>	e S L II III F	7 27 46						
				34 43						
				42 00						
				45 14	17	14				
				45 15	16		12			
				9 13						
420	31	I <sub>r</sub>	eP L F	11 44 44						
				48 48						
				12 26						
421	31	I	e F	16 45						
				17 04						

1770 Melt in Guma (Mariana Islands).