

# SEISMOLOGICAL BULLETIN 1914.

## BATAVIA OBSERVATORY, JAVA.

### PREFACE.

The astatic Seismograph of WIECHERT of 1000 K.G. has been registering regularly since December 6<sup>th</sup> 1908. The results are published from the beginning of 1909 (the Messina earthquake included) in a monthly bulletin.

The instrument is mounted on a heavy brick pillar in a room with thick walls (about 70 centimeters) which is protected against the sun's heat by open galleries around it. The components are placed in E.-W. and N.-S. direction respectively.

The pins are lifted electrically every hour for a period of 10 seconds by the Javanese observer on duty. A lifting of two seconds every minute is given by an electrical clock of PEYER FAVARGER by means of the second-dial passing every minute through a drop of mercury.

For each month are applied the mean constants for that month.  $T_0$  and  $\epsilon$ , the oscillation period and the coefficient of damping, are determined every week.  $V$ , the magnification for very short waves, is determined occasionally only. It is found by direct measurement by giving the pendulum a displacement by means of the horizontal adjusting screws, of which the value can be determined easily from the pitch ( $a$ ) and the angle of displacement of the screws and the height of the screws ( $b$ ) and of the centre of gravity ( $c$ ) above the Cardanic suspension apparatus.

It was found:

- (a) = 1.407 millimeters.
- (b) = 1225           "
- (c) = 895           "

The constants used in last year are given below.

1912.	E.-W. component.			N.-S. component.		
	V.	$T_0$ .	$\epsilon$ .	V.	$T_0$ .	$\epsilon$ .
January . . . . .	214	7.2	4.2	187	9.0	5.3
February . . . . .	"	7.2	4.3	"	8.7	4.9
March . . . . .	"	7.1	4.5	"	8.5	5.1
April . . . . .	"	6.9	3.6	"	8.4	6.2
May . . . . .	"	6.9	3.8	"	8.3	4.6
June . . . . .	"	7.2	4.4	"	8.0	4.1
July . . . . .	"	7.0	3.9	"	8.0	4.1
August . . . . .	"	9.6	3.3	"	9.6	6.1
September . . . . .	"	10.0	2.6	"	14.0	6.8
October . . . . .	217	9.8	4.7	186	13.8	3.4
November . . . . .	"	12.0	5.0	"	11.8	4.7
December . . . . .	"	11.8	3.2	"	11.6	4.0



The notation employed is that of the Göttingen Geophysical Institute.  
The following abbreviations are employed:

### CHARACTER OF THE EARTHQUAKE.

- I = perceptible; II = moderately strong; III = strong.  
 d (terrae motus domesticus) = local.  
 v ( " " vicinus) = near (less than 1000 K.M.).  
 r ( " " remotus) = distant (1000 to 5000 K.M.).  
 u ( " " ultimus) = very distant (over 5000 K.M.).

### PHASES.

- P (undae primae) = 1<sup>st</sup> preliminary tremors.  
 S ( " secundae) = 2<sup>nd</sup> " "  
 L ( " longae) = principal phase, long waves.  
 M ( " maximae) = maximum amplitude.  
 C (coda) = prominent waves among the after tremors.  
 F (finis) = end of perceptible movement.  
 PR<sub>1</sub>, PR<sub>2</sub>, ..... SR<sub>1</sub>, SR<sub>2</sub>, ..... = 1<sup>st</sup>, 2<sup>nd</sup> ..... reflected waves of P and S.  
 PS = Waves changed by reflection from longitudinal to transversal oscillation.

### WAVE-ELEMENTS, UNITS.

- T = Complete Period in seconds.  
 A = Amplitude, measured from median position in microns.  
 A<sub>E</sub> = E.-W. component of A.  
 A<sub>N</sub> = N.-S. " " "  
 i (impetus) = abrupt commencement, clearly defined.  
 e (emersio) = gradual " , not clearly defined.

Year	N.-S. component		E.-W. component		Total
	T	A	T	A	
1870	187	187	187	187	187
1871	187	187	187	187	187
1872	187	187	187	187	187
1873	187	187	187	187	187
1874	187	187	187	187	187
1875	187	187	187	187	187
1876	187	187	187	187	187
1877	187	187	187	187	187
1878	187	187	187	187	187
1879	187	187	187	187	187
1880	187	187	187	187	187
1881	187	187	187	187	187
1882	187	187	187	187	187
1883	187	187	187	187	187
1884	187	187	187	187	187
1885	187	187	187	187	187
1886	187	187	187	187	187
1887	187	187	187	187	187
1888	187	187	187	187	187
1889	187	187	187	187	187
1890	187	187	187	187	187
1891	187	187	187	187	187
1892	187	187	187	187	187
1893	187	187	187	187	187
1894	187	187	187	187	187
1895	187	187	187	187	187
1896	187	187	187	187	187
1897	187	187	187	187	187
1898	187	187	187	187	187
1899	187	187	187	187	187
1900	187	187	187	187	187



# SEISMOLOGICAL BULLETIN.

## JANUARY 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

N <sup>o</sup> .	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half).		Remarks.
										A <sub>E</sub> .	A <sub>X</sub> .	
1	4	Jan.	I,	P	h	m	s	6	500 ?	4.9	5.2	S a little uncertain. In Malabar: P = 15 37 24 S = 13 37 51 M = 15 38 50 F = 13 41
				S	13	57	20					
				M <sub>1</sub>	13	37	58					
				M <sub>2</sub>	15	38						
				F	15	41						
2	8	"	I,	P	20	23	11	5.5	160 ?	5.7	4.7	
				S?	20	23	50					
				M	20	24						
				F	20	30						
3	12	"	I	i	9	56	22	6		12.2	26.2	Probably i = i s.
				M	9	45						
				e L	9	54						
				M <sub>L</sub>	9	59						
				F	10	50						
4	15	"	I,	P	5	9	56	6	500	4.9	5.2	
				S	5	10	30					
				M	5	11						
				F	5	15						
5	13	"	I,	e P	5	18	6	6	225 ?	6.5	14.0	
				S	5	18	35					
				M	5	18	39					
				F	5	28						
6	14	"	I	e	4	42		6	13	4.5	4.7	
				M	4	47						
				M <sub>L</sub>	4	50						
				F	5	5						
7	15	"	II,	i P	7	46	0	6	500	74.2	88.9	In Malabar: P - S = 44 sec.
				i S	7	46	35					
				M	7	46	44					
				F	8	10	—					
8	15	"	I	E	19	20		6	20	6.5	6.1	
				M	19	35						
				e L	19	40						
				M <sub>L</sub>	19	51						
				F	20	28						



N <sup>o</sup> .	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
9	18	Jan.	I,	P	h	m	s	5.5	1000	29.1	38.5	Felt in Padang, Painan, Poelo Bodjo, Woeara La- boek and Loeboek Ki- langan, Padangsche Be- nedenlanden, Sumatra.
				S	10	45	37					
				M	10	45	19					
				F	10	46	19					
10	20	"	I <sub>a</sub>	i P	12	11	48	6	8800	26.0	25.5	
				i S	12	22	12					
				M	12	22						
				e L	12	35						
				M L	12	50						
F	15	15										
11	23	"	I <sub>v</sub>	i P	0	7	50	6	740	36.9	31.5	In Malabar: i P = 0 7 21 i S = 0 8 41 M = 0 9 10 F = 0 15
				i S	0	8	50					
				M	0	9	—					
				F	0	23						
12	25	"	I	e	19	19						
				M	19	24						
				F	19	32						
13	25	"	I,	P	16	40	20	6	410?	8.5	7.0	
				S?	16	41	8					
				M	16	45						
				F	16	50						
14	26	"	I	e	22	30	24					
				e L	22	43						
				M <sub>L</sub>	22	49						
				F	25	18						
15	30	"	I <sub>a</sub>	E	5	56	6		8.5	21.1		
				M	3	60						
				e L	4	16						
				M L <sub>1</sub>	4	19						
				M L <sub>2</sub>	4	38						
				M L <sub>3</sub>	4	51						
				M L <sub>4</sub>	5	10						
				M L <sub>5</sub>	5	22						
F	6	18										
16	31	"	III,	i P	15	15	5	6	320	284	306	Malabar P—S = 42 sec.  Felt in Goenoeng Walet, Preanger Regentships.
				i S	15	15	41					
				M	15	15						
				F	15	27						



# SEISMOLOGICAL BULLETIN.

## FEBRUARY 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
17	1	Febr.	I <sub>v</sub>	P	2	45				μ	μ	
				F	2	50						
18	5	"	I	e	11	51						
				M	11	56	3.5			4.5	5.5	
				F	12	5						
19	4	"	I	e	18	58						
				F	19	10						
20	6	"	I	e	11	52						
				M	11	60	6			6.0	6.6	
				e L	12	11						
				M <sub>L</sub>	12	15	20			7.5	7.9	
				F	12	25						
21	6	"	I	i	14	21	1					
				M	14	21	5	6		12.0	11.4	
				F	14	27						
22	7	"	I	e	6	58						
				S	6	59	38					
				M	6	60		6		2.8		End overtaken by following earthquake.
23	7	"	I	M	7	10		6		9.6	12.3	
				F	7	23						
24	8	"	I <sub>v</sub>	P	2	58	24		140 ?			P and S uncertain
				S	2	58	41					In Malabar:
				M	3	1		6		10.0	9.0	P-S = 10 sec.
				F	3	5						
25	8	"	I	e	15	46						
				e L	15	52						
				M	15	55	6			4.4	5.2	
				M <sub>L</sub>	15	57						
				F	16	11						
26	11	"	II <sub>v</sub>	i P	15	38	58		180			Time a little uncertain by
				S	15	39	19					failure of time mark.
				M	15	39	50	6		112	98	
				F	15	53						



No.	Date 1913.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
27	13	Febr.	I <sub>v</sub>	P	h	m	s		140	μ	μ	Very small.
				S	17	26	48					
				M	17	27	5					
				F	17	28						
28	15	"	III <sub>v</sub>	i P	19	1	25		180			
				i S	19	1	45					
				M	19	5		6	228	578		
				F	19	28						
29	15	"	I <sub>v</sub>	P	21	41	52		180			
				S	21	41	51					
				M	21	45		6	4.4	5.2		
				F	21	49						
30	15	"	I <sub>n</sub>	P	1	26	49		7000			
				S	1	55	22					
				M	1	56		6	24.5	15.1		
				F	1	58						
51	20	"	I <sub>r</sub>	e	4	51						Northeastern Mindanao, Philippines.
				M	4	56		6	10.4	7.1		
				F	4	40						
52	20	"	I <sub>r</sub>	e	9	45						Northeastern Mindanao, Philippines.
				M	9	48		6	4.4	7.1		
				F	9	56						
55	22	"	I <sub>v</sub>	e P	20	50	22					
				S	20	51	41					
				M	20	52		6	3.2	2.8		
				F	20	59						
54	25	"	I <sub>r</sub>	e P	4	5	59					Felt in Donggala, Celebes.
				S	4	7	11					
				M	4	9		6	35.7	42.6		
				F	4	28						
55	24	"	I <sub>r</sub>	e	11	55						Western Mindanao, Philippines.
				M	12	0		6	5.6	4.5		
				F	12	15						
56	26	"	I <sub>r</sub>	P	5	40	45		1700?			
				S ?	5	45	55					
				M	5	46		7	7.4	6.7		
				F	5	57						
57	26	"	I <sub>r</sub>	e	5	18	2					
				M	5	41	22	8	38.6	16.9		
				e L	5	45						
				M <sub>L</sub>	5	57		28	39.0	13.2		
				F	7	5						
58	26	"	I	e	7	24						
				F	7	28						
59	27	"	I	e	5	25						
				M	5	27						
				F	5	30						



# SEISMOLOGICAL BULLETIN.

## MARCH 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quattair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

N <sup>o</sup> .	Date 1914.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
					h	m	s			μ	μ	
40	4	March.	I <sub>r</sub>	e F	13 14	25 8						
41	4	"	I <sub>r</sub>	e e L F	15 16 16	31 12 43						
42	4	"	I <sub>r</sub>	e e L F	18 18 19	42 31 23						
45	6	"	I <sub>u</sub>	P S M e L M <sub>L</sub> F	19 19 19 19 20 20	17 26 27 52 1 18	22 52 13	6 14	8200	13.2 7.4	9.4 8.4	P and S a little uncertain.
44	6	"	I	e M F	20 20 21	48 54 23	30	6		28.5	26.2	Felt in Lho Nga and Blang Kidjeren, Atjeh.
45	8	"	I	e M F	11 11 11	25 29 43	54	6		25.5	19.2	
46	9	"	I <sub>v</sub>	e M F	11 11 11	6 8 11	57					Very small.
47	14	"	I <sub>u</sub>	S ? M e L M <sub>L</sub> F	20 20 20 20 21	9 11 28 40 1	35	6 12		18.4 12.3	37.9 16.0	P fails.
48	16	"	I	i M F	22 22 23	48 55 20	57	6		56.1	44.9	
49	17	"	I <sub>r</sub>	e P S ? M F	17 17 17 17	0 3 3 19	3 46	6	2300 ?	16.0	11.7	



No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.		
										A <sub>E</sub> .	A <sub>N</sub> .			
					h	m	s			μ	μ			
50	18	March.	I <sub>u</sub>	e	4	31								
				S?	4	41	50							
				M	4	42	8	7		11.8	11.1			
				e L	5	10		14		10.8	11.2			
				M <sub>L</sub>	5	13								
F	5	38												
51	18	"	I <sub>u</sub>	e P	6	29	33							
				e S	6	39	1							
				M	6	39	33	6		8.8	7.0			
				e L	7	7		12						
				M <sub>L</sub>	7	18								
F	7	38												
52	20	"	I	e	14	10								
				M	14	13		5		29.3	22.5		Felt in Soekaboemi and Goenoeng Walet, Pre- anger Regentships.	
				F	14	24								
53	22	"	I <sub>v</sub>	P	18	19	4							
				M	18	24		6		4.4	4.7			
				F	18	31								
54	24	"	I	e	0	17								
				F	0	25							Felt in Padang.	
55	24	"	I <sub>v</sub>	P	10	35	2							
				M	10	37		5		12.0	12.9			
				F	10	45								
56	25	"	I <sub>v</sub>	e P	1	12	51		210					
				S	1	12	35						In Malabar $\Delta = 120$ .	
				M	1	14								
				F	1	18								
57	26	"	I	e	20	49								
				F	20	56								
58	27	"	I <sub>u</sub>	S?	1	17	25							
				M	1	18	48	6		4.4	3.7			
				e L	1	38		12		5.1	4.9			
				M <sub>L</sub>	1	52								
				F	2	5								
59	28	"	II <sub>u</sub>	i P	10	51	24		8850?					
				S?	11	1	28							
				M	11	4		6		197	117			
				F	11	46								
60	30	"	I <sub>u</sub>	P	1	0	53		14500?					
				S?	1	15	37							
				e L	1	18								
				M L <sub>1</sub>	1	35		18		15.8	22.1			
				M L <sub>2</sub>	2	10		24		14.9	43.7			
				F	5	16								
61	31	"	I <sub>r</sub>	P	5	58	54		600					
				S	4	0	0						Felt in Benkoelen.	
				M	4	1		5.5		15.4	14.2			
				F	4	10								



# SEISMOLOGICAL BULLETIN.

## APRIL 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
62	3	April.	I	e P	h	m	s	6		9.7	10.4	
				S ?	5	25	15					
				M	5	34						
				F	5	35						
63	8	»	I <sub>r</sub>	e P	12	14	50	6	1400	8.5	10.8	
				S	12	17	27					
				M	12	18						
				F	12	28						
64	9	»	I	e	5	45		6	10.1		Felt in Rondeng, Atjeh.	
				M	3	55						
				e L	4	6						
				M <sub>L</sub>	4	12						
65	9	»	I	e	5	16		6	27.9	24.8		
				M	5	21						
				F	5	48						
66	9	»	I <sub>u</sub>	i P	9	31	46	6	7000	10.1	10.8	
				S	9	40	21					
				M	9	41						
				F	9	45						
67	11	»	II <sub>u</sub>	e	16	40		6	35.5	24.4		
				M <sub>1</sub>	16	45						
				e L	16	51						
				M <sub>L1</sub>	17	0	34					
				M <sub>L2</sub>	17	25	12					
				F	18	45						
68	14	»	I <sub>v</sub>	i P	12	34	48	6	580	21.0	20.8	In Malabar: P-S = 35 sec. and Δ = 320.
				i S = M.	12	35	31					
				F	12	44	44					
69	15	»	I	e	4	12		24	17.0	22.2		
				M <sub>L</sub>	4	28						
				F	4	46						
70	15	»	I	e	19	55		6	3.9	4.1		
				M	20	2						
				F	20	8						



N <sup>o</sup> .	Date 1913.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
71	18	April.	I <sub>v</sub>	P	h	m	s	55	420	19.8	19.4	In Malabar: P-S = 61 sec. Δ = 550.
				S	2	26	25					
				M	2	27	13					
				F	2	28						
72	19	"	II	i P	19	57	36	6	210	171.	181.—	
				i S	19	38	1					
				M	19	40						
				F	19	58						
73	20	"	I <sub>r</sub>	e	13	50	52	6		18.6	12.5	
				S?	13	56	20					
				M	14	4						
				e L	14	16						
				M L <sub>1</sub>	14	33						
				M L <sub>2</sub>	14	33						
				M L <sub>3</sub>	15	8						
F	15	48										
74	20	"	I <sub>v</sub>	P	23	6	57	6	350	62.3	76.8	
				S	23	7	36					
				M	23	11						
				F	23	55						
75	23	"	I	e P	13	5						
				M	13	6						
				F	13	12						
76	23	"	I <sub>u</sub>	P	16	31	2	6	6800	6.2	8.1	
				S	16	39	19					
				M	16	40						
				F	17	13						
77	27	"	II <sub>v</sub>	i P	2	7		9	620	138	227	S a little uncertain. Felt in Toeren, Res. Pasoe- roean, Java.
				S	2	8						
				M	2	10						
				F	3	33						
78	27	"	I <sub>v</sub>	i P	14	23	34	6	190	17.8	23.0	
				i S	14	23	55					
				M	14	25						
				F	14	36						
79	28	"	I	e	11	44						
				M	11	51						
				F	12	3						



# SEISMOLOGICAL BULLETIN.

## MAY 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1914.		Char-acter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi-centrum.	Amplitude (half)		Remarks.	
										A <sub>E</sub> .	A <sub>N</sub> .		
80	1	May.	I <sub>a</sub>	e P	5	40	46	6	6000?	μ	μ		
				S ?	5	48							
				M	5	52				11.9	13.6		
				e L	5	55				22	23.2		31.3
				M <sub>L</sub>	5	59							
F	6	58											
81	8	"	I	e	12	2		1550					
				F	12	10							
82	9	"	I <sub>r</sub>	P	0	45	10	6	1550				
				S	0	47	34						
				M <sub>1</sub>	0	48				12.3	7.2		
				M <sub>2</sub>	0	55				6	15.1		15.4
				F	1	18							
83	14	"	III <sub>a</sub>	i P	20	50	29	160			Immediately after S the pens are thrown away. Malabar: i P = 20 50 11 i S = 20 50 16 Δ = 40. Felt in whole West-Java.		
				i S	20	50	47						
84	18	"	I	e	23	51		24		20.6	15.1	Felt in Rante Pao, Celebes.	
				M <sub>L</sub>	0	7							
				F	0	18							
85	19	"	I	e	4	52							
				F	5	25							
86	20	"	I	e	16	51							
				F	16	42							
87	21	"	I	e	4	56							
				M	5	0							
				F	5	11							
88	21	"	I	e	8	51							
				F	9	15							



No.	Date 1913.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
89	21	May.	I <sub>v</sub>	P	h	m	s	180	μ	μ	Malabar P-S = 20 sec. Δ = 180.	
	22			S	23	58	48					< 1
90	22	"	I <sub>v</sub>	e P	8	34	37	6	12.3	7.2		
				S	5	36	19					
91	25	"	I <sub>v</sub>	i P	21	52	7	180	57.5	44.5	In Malabar: i P = 21 52 2 i S = 21 52 18 M = 21 52 40 P = 22 4 Δ = 140.	
				i S	21	52	27					
92	26	"	I	e	10	38		4400	> 411.	> 336.	Felt in Lebak Parai, Ban- tam, Java.	
				F	10	49						
93	26	"	III <sub>r</sub>	i P	14	29	0	8	> 411.	> 336.	At 14 35 the pendulum was put out of order by the strong movement. Direction E-W. Strong earthquake at Japenei- land N. of Nieuw Guinea. Also felt in Ambon Neira.	
				S?	14	34						
94	27	"	I	e	2	17		6	> 411.	> 336.	Direction E-W. Strong earthquake at Japenei- land N. of Nieuw Guinea. Also felt in Ambon Neira.	
				M	2	22						
95	28	"	I	F	2	36		6	> 411.	> 336.	Felt in Posso and Donggala, Celebes.	
				e	1	52						
96	28	"	I	M	1	58		6	6.3	5.0		
				F	2	23						
97	29	"	III <sub>r</sub>	e	8	40		6	6.3	5.0		
				M	8	46						
97	29	"	III <sub>r</sub>	P	4	49	58	1700?	> 337.	> 339.	Felt in Poelo-Tello, Padang and Padang-Pandjang, W. coast of Sumatra. Before M the pendulum is put out of order.	
				S?	4	52	43					
97	29	"	III <sub>r</sub>	M	4	?		6	> 337.	> 339.	Before M the pendulum is put out of order.	
				P	4	49	58					



# SEISMOLOGICAL BULLETIN.

## JUNE 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
98	2	June.	III <sub>v</sub>	i P	h	m	s	6	260	μ	μ	In Malabar. i P—i S = 15 sec. Δ = 130 Felt in the residencies Pre-anger, Banjoemas, Cheribon, Pekalongan and Kedoe.
				i S	17	19	48					
				M	17	20	16					
				F	17	22	55					
99	3	"	I	e	6	43						
				F	6	51						
100	4	"	I	e	13	58			10.0	23.7		
				M	13	45						
				F	15	57						
101	4	"	I	e	16	29						
				M	16	53						
				F	16	59						
102	5	"	I <sub>v</sub>	P	20	13	0	6	370	μ	μ	
				S	20	15	42					
				M	20	17						
				F	20	54						
103	6	"	II <sub>v</sub>	i P	4	10	25	6	340	μ	μ	
				i S	4	11	2					
				M	4	12						
				F	4	58						
104	7	"	I	e	20	54			6.7	5.7	Felt in Banggai, Toli-Toli and Gorontalo, Celebes.	
				M	20	58						
				F	20	48						
105	8	"	II <sub>v</sub>	i P	6	42	5	5	170	μ	μ	
				i S	6	42	24					
				M	6	44						
				F	6	57						
106	13	"	I <sub>v</sub>	P	19	59	2	4	220	μ	μ	
				i S	19	59	58					
				M	19	40						
				S	19	45						
107	13	"	I	e	23	46					Very small.	
				F	23	51						



N <sup>o</sup> .	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
108	14	June.	I <sub>v</sub>	e P M F	h m s 20 18 58 20 21 20 37		6.5		10.9	10.0	Felt in Buitenzorg.	
109	16	"	I <sub>v</sub>	e P S M F	4 2 41 4 3 55 4 5 4 16		7	670	7.8	11.5		
110	18	"	I <sub>v</sub>	P S M F	23 18 50 23 19 15 23 23 23 58		6.5	370	18.9	25.5		
111	20	"	II <sub>n</sub>	i P M e L M <sub>L</sub> F	7 30 22 7 41 7 46 8 1 9 20		6 24		62.1 151.5	65.5 11.61		
112	20	"	I	e M F	10 34 10 45 11 8		7		12.8	13.9		
113	20	"	I <sub>n</sub>	P S M	23 46 1 23 54 51 23 55		6	7200	8.9	14.8		
	21	"		e L M <sub>L</sub> F	0 8 0 10 0 44		18		18.0	35.1		
114	21	"	I	e F	8 15 8 55							
115	25	"	I <sub>v</sub>	P S M F	10 55 41 10 55 56 10 56 10 59		6	150	5.0	6.5	Malabar: i P = 10 55 29 i S = 10 55 40 △ = 95 Felt in Tjibadak, Preanger.	
116	25	"	III <sub>a</sub>	i P	19 8 40			580			Pen E. W. thrown away at 19 8 44, N. S. at 19 9 51. Epic. 4° 2 S. 102° 0 E. Destructive earthquake at Benkoelen; Malabar i P = 19 8 51 S = 19 10 0 △ = 700.	
117	26	"	I	e F	5 22 5 45							
118	29	"	I <sub>v</sub>	P M e L M <sub>L</sub>	5 0 29 5 6 5 15 5 59		6 14		19.9 25.9	20.0 24.8	End overtaken by following earthquake.	

N <sup>o</sup> .	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
119	26	June.	I <sub>n</sub>	P S? M M <sub>L</sub> F	h m s 6 5 0 6 11 58 6 13 6 55 6 55		6	7100 ?	8.2	10.2		
120	26	"	I	e F	12 49 13 9							
121	26	"	I <sub>v</sub>	P i S = M. F	14 10 48 14 11 15 14 14						P a little uncertain.	
122	29	"	I <sub>v</sub>	P S M F	23 16 1 23 16 20 23 17 23 25		5.5		11.0	14.7	P and S uncertain.	
123	30	"	I <sub>v</sub>	P S M F	22 36 57 22 37 49 22 45 23 27		6		39.0	45.0	S very uncertain.	



# SEISMOLOGICAL BULLETIN.

## JULY 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
124	2	July.	I <sub>v</sub>	i P i S = M F	h 17 17 17	m 4 5 27	s 52 9 7	4	160	54.8	56.0	In Malabar P—S = 15 sec. △ = 140. Felt in Tjipetir, Preanger, Java.
125	3	"	I	e F	7 8	54 7						
126	3	"	I	e F	20 20	6 42						
127	4	"	I <sub>u</sub>	e P S M F	11 11 11 11	19 30 31 51	49 30	6	10 500	9.0	8.5	
128	4	"	I <sub>r</sub>	i P S M F	17 18 18 18	55 1 5 38	48 45 1	6	4200	53.9	42.5	
129	4	"	II <sub>v</sub>	i P i S M F	25 25 25 0	45 44 49 55	59 22	7	370	170.1	121.7	
150	5	"	I <sub>r</sub>	e M <sub>1</sub> M <sub>2</sub> eL F	1 22 22 22 22	57 5 5 10 49	56	6.5 6		32.1 43.2	41.0	
151	6	"	I <sub>v</sub>	i P M F	6 6 7	44 46 21	16	5		19.7	18.1	
152	8	"	I <sub>v</sub>	P S? M F	25 25 25 0	56 57 58 8	55	6	270?	6.6	6.5	In Malabar P—S = 10 sec. △ = 95.
153	11	"	I <sub>v</sub>	i P i S M F	4 4 4 4	59 40 42 56	58 47 39	5	450	75 0	51.2	In Malabar i P—i S = 62 sec. △ = 570. Felt in Manna, Tandjong



No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
					h	m	s			μ	μ	
134	14	July.	I <sub>v</sub>	P	0	50	55		450			
				S	0	51	26					
				M	0	54		5.5		21.7	51.5	
				F	1	20						
135	14	"	III <sub>v</sub>	i P	5	11	51		450			
				i S	5	12	19					
				M	5	18		6		> 362.9	> 407.3	Pendulum touches adjusting screws.
				F	5	49						In Malabar P—S = 58 sec. △ = 510.
136	16	"	I <sub>v</sub>	i P	8	47	24		220?			
				S ?	8	47	48					
				M	8	50		5		54.2	21.9	
				F	9	0						
137	17	"	I	e	7	21						
				M	7	51		8		11.2	8.6	
				F	7	44						
138	18	"	II <sub>v</sub>	i P	21	57	20		160			
				i S	21	57	38					
				M	22	0		5.5		159.8	151.8	
				F	22	16						
139	19	"	I <sub>v</sub>	P	14	57	54		240?			Very small, S uncertain.
				S	14	58	22					
				M	14	58	51	6		4.5	5.7	
				F	15	4						
140	20	"	I <sub>v</sub>	P	25	47	1		450			In Malabar P—S = 56 sec.
				S = M	25	47	51	5.5		7.5	10.9	△ = 500.
				F	25	56						
141	21	"	I <sub>v</sub>	i P	18	47	22		160			
				i S	18	47	40					
				M	18	49	16	6		45.9	50.9	
				F	19	1						
142	22	"	I <sub>v</sub>	P	4	16	57		220			
				S	4	17	21					
				M	4	28		6		41.5	58.5	
				F	4	52						
143	25	"	I	e	21	57						
				M	22	4		7		14.9	14.1	
				F	22	54						
144	29	"	I <sub>v</sub>	P	16	7	46		210			In Malabar P—S = 10 sec.
				i S	16	8	10					△ = 80.
				M	16	9	15	5		10.6	6.0	Felt in Tjikorai, Preanger, Java.
				F	16	15						



# SEISMOLOGICAL BULLETIN.

## AUGUST 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

N <sup>o</sup> .	Date 1914.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
145	1	Aug.	I	e F	h 10 10	m 32 57	s			$\mu$	$\mu$	
146	2	"	I <sub>v</sub>	i P i S M <sub>s</sub> M <sub>E</sub> F	21 21 21 21	45 46 46 48	52 11 14	< 1 6	170	36.4	45.8	Felt in Lebak-Parai, Ban- tam, Java.
147	4	"	I <sub>v</sub>	P i S = M. F	6 6 6	20 20 27	27 44	< 1	160	12.5	14.4	Felt in Lebak-Parai, Ban- tam, Java.
148	4	"	II <sub>u</sub>	e P S? e L M F	22 23 23 23 0	50 2 7 14 59	55 6	13	15000 ?	298.2	561.4	
149	6	"	II <sub>v</sub>	i P S M F	4 4 4 4	13 14 19 59	58 25 7	6	225	135.1	125.0	
150	8	"	I <sub>v</sub>	i P i S M F	2 2 2 2	30 30 32 49	1 21	6	180	72.4	79.0	
151	9	"	I	e M F	22 22 22	49 52 59		6		6.9	7.7	
152	10	"	I	e F	0 1	55 1						
153	12	"	I	e M F	21 21 21	9 13 54		6		16.0	19.4	
154	14	"	I	e M F	20 20 20	5 9 24		6		5.0	3.7	

From 20 Aug. 4<sup>h</sup> 10  
till 24 " 1<sup>h</sup> 50<sup>m</sup>  
no registration by repair





# SEISMOLOGICAL BULLETIN.

## SEPTEMBER 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartaire.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
155	1	Sept.	I <sub>v</sub>	e	h	m	s	6		μ	μ	Felt in Gondosoeli, Madi oen, and in several pla- ces of Pasoeroean, Java.
					14	3	28			4.7	3.7	
					M	14	6					
156	2	"	I <sub>r</sub>	i P	20	23	12	5.5	2700	39.4	34.4	
				S	20	27	31					
				M	20	29						
				F	20	49						
157	5	"	I <sub>v</sub>	e	1	18	29	6		5.3	7.4	Felt in Singkel, Tapanoeli, Sumatra.
				S	1	19	10					
				M	1	21						
				F	1	33						
158	5	"	I <sub>v</sub>	e	5	19	6					
				M	5	21						
				F	5	27						
159	5	"	I <sub>r</sub>	i P	25	21	55	6	2700	17.2	22.5	
				i S	25	26	15					
				M	25	28						
				F	25	44						
160	6	"	I	e	5	6	6		17.2	17.1	Probably felt in Menado, Celebes.	
				M	5	17						
				F	5	35						
161	6	"	I	e	22	4	7		6.2	5.8		
				M	22	14						
				F	22	29						
162	9	"	I	e	15	3						
				F	15	7						
163	12	"	I	e	10	9	6		7.2	6.7		
				M	10	15						
				F	10	21						
164	13	"	I	e	17	22	6		91	10.8		
				M	17	29						
				F	17	52						
165	14	"	I	e	25	53	6		19.1	14.8		
				M	23	55						
				F	0	50						
165	15	"										



No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
166	15	Sept.	I	e	2	57			μ	μ		
				F	3	9						
167	17	"	I <sub>v</sub>	e P	7	5	18	6	540	9.7	26.3	In Malabar: P - S = 35 sec. △ = 320.
				S	7	5	56					
				M	7	6						
				F	7	16						
168	17	"	I	e	12	55		6		6.9	7.4	
				M	12	57						
				F	13	8						
169	17	"	I <sub>r</sub>	P	15	51	55	6		40.7	46.4	Felt in Gorentalo, Celebes.
				M	15	56						
				F	16	1						
170	17	"	I	e	25	49						
	18	"		F	0	2						
171	20	"	I	e	8	35		6		7.2	8.5	
				M	8	41						
				F	8	51						
172	25	"	I <sub>r</sub>	i P	1	52	11	5		38.5	26.3	Felt in Posso, Banggai and Gorontalo, Celebes.
				M	1	58						
				F	2	17						
175	25	"	I <sub>v</sub>	i P	25	16	21	6		81.2	95.5	S uncertain.
				S	25	16	41					
				M	25	18						
				F	25	45						
174	24	"	I	e	1	7		6		11.3	14.1	
				M	1	9						
				F	1	18						
175	26	"	I	e	5	26		6		5.1	6.7	
				M	5	27						
				F	5	35						
176	25	"	I	e	6	18						
				F	6	25						
177	29	"	I	e	18	57		5		5.5	5.9	
				M	19	2						
				F	19	21						



# SEISMOLOGICAL BULLETIN.

## OCTOBER 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
178	1	Oct.	I <sub>r</sub>	e	h	m	s	6	4500 ?	μ	μ	
				S	6	50	52			12.9	9.3	
				M	6	56	53					
				F	6	59	9					
179	1	»	I <sub>r</sub>	e	10	6						
				M	10	8						
				F	10	15						
180	2	»	I <sub>r</sub>	P	5	0	2	6	1150	15.7	10.0	
				S	5	2	9					
				M	3	4						
				F	3	19						
181	3	»	I <sub>u</sub>	e	17	42	6		16.6	16.7		
				M	17	51						
				e L	18	59						
				M L <sub>1</sub>	18	45						30
				M L <sub>2</sub>	18	54						24
				M L <sub>3</sub>	19	6						18
182	3	»	I <sub>u</sub>	P	22	19	56	6	9500	23.2	37.8	
				S	22	29	53					
				M	22	55						
				e L	22	45						
				M L <sub>1</sub>	22	55	24					
				M L <sub>2</sub>	22	58	20					
183	4	»	I <sub>r</sub>	P	2	54	55	5	140	11.8	11.9	
				S	2	54	50					
				M	2	56						
				F	3	0						
184	4	»	I <sub>r</sub>	i P	9	28	47	6		27.3	26.7	Felt in Kendari, Celebes.
				M	9	55						
				F	9	56						
185	6	»	I <sub>u</sub>	P	19	27	12	6	8100	14.4	11.5	
				S	19	56	25					
				M	19	58						
				e L	19	52						
				M L	19	58	20					
				F	20	23						



No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
186	9	Oct.	I <sub>v</sub>	P S M F	h m s 2 2 56 2 3 9 2 4 2 7			110	μ	μ	Very small.	
187	9	"	I	e M F	2 48 2 58 3 27	7			9.7	7.5		
188	9	"	I <sub>v</sub>	P S M F	6 55 53 6 56 4 6 57 6 42	6		280	6.5	8.2		
189	11	"	I <sub>v</sub>	P S M F	2 12 50 2 15 6 2 15 2 16			140			Very small.	
190	11	"	I <sub>v</sub>	P S M F	2 19 39 2 20 4 2 20 2 24			220			Very small.	
191	11	"	I	e P M F	16 21 48 16 50 16 50	6			17.6	24.5		
192	11	"	I	e M F	23 53 23 55 23 59							
193	14	"	I <sub>v</sub>	P S M F	6 59 18 6 59 53 6 40 6 45			130			In Malabar i P—i S=11 sec. △ = 100.	
194	14	"	I	e M F	14 4 14 11 14 50	6			6.0	5.2		
195	14	"	I <sub>v</sub>	e M F	16 49 16 52 16 59							
196	16	"	I	e F	22 22 22 55							
197	16	"	I	e M F	25 20 25 25 25 58	6			5.0	4.1		
198	21	"	I <sub>v</sub>	e P S? M e L M <sub>L</sub> F	15 45 4 15 52 36 15 56 16 5 16 6 16 25	7 20			8.5	6.1		

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
199	23	Oct.	I <sub>v</sub>	i P S M F	6 23 52 6 24 49 6 30 7 35			520			> 242.6 256.0	
200	26	"	I	e M F	15 1 15 7 15 19	6			10.8	11.4		
201	27	"	I <sub>v</sub>	P S M F	4 9 13 4 10 55 4 14 4 40	6		920	10.1	8.0		
202	27	"	I <sub>v</sub>	i P i S M F	4 55 14 4 55 29 4 57 5 5	5		140	24.3	50.9	Felt in Rangkasbetoeng, and Pandeglang, Bantam and Goenoeng Walet, Preanger, Java.	
203	28	"	I <sub>v</sub>	P M e L M <sub>L</sub> F	0 28 5 0 58 0 50 0 58 1 19	5.5 22			8.2	8.8		
204	28	"	I	e M F	9 22 9 54 9 48	6			9.5	8.5		
205	30	"	I	e M F	9 6 9 9 9 12							
206	31	"	I <sub>v</sub>	e M F	15 37 15 59 15 45							



# SEISMOLOGICAL BULLETIN.

## NOVEMBER 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
207	5	Nov.	I	P	h	m	s			μ	μ	
				M	5	40	29					
				F	5	50						
					6	0						
208	7	"	I,	P	6	41	49		500?			
				S?	6	42	57					
				M	6	44		6		35.8	25.6	
				F	7	10						
209	8	"	I,	P	1	22	17		550?			
				S?	1	25	12					
				M	1	24		6		18.7	11.4	
				F	1	31						
210	8	"	I	e	12	5						
				M	12	15						
				F	12	31						
211	8	"	I,	e	17	14						
				F	17	19						
212	9	"	I,	P	16	1	25		550			Felt in Djambi and Moea- ra Tambisi, Sumatra.
				S	16	2	25					
				M	16	5		6		12.5	13.5	
				F	16	15						
213	10	"	I,	e	6	44						
				M	6	55		6		9.7	9.9	
				e L	7	10						
				M <sub>L</sub>	7	17		18				
				F	7	44						
214	10	"	I,	P	17	54	29		540			In Malabar
				i S	17	54	56					P - S = 29 sec.
				M	17	56		5		28.4	29.0	△ = 270.
				F	17	46						
215	12	"	I,	P	6	37	44		2500			
				S	6	41	54					
				M	6	42		6		7.8	9.5	
				F	6	52						



No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
216	14	Nov.	II,	i P i S M F	h m s 9 25 22 9 25 40 9 27 8 9 48		6	160	251.6	317.9		
217	15	"	I,	P S M F	20 14 32 20 14 56 20 16 20 19			220			Very small.	
218	16	"	I,	e S=M F	11 28 1 11 28 19 11 51			160			Felt in Goenoeng Walet and Tjikorai, Preanger, Java	
219	18	"	I <sub>n</sub>	e M e L M <sub>L</sub> F	9 59 10 11 11 2 11 28 11 48		6 28		4.1	5.2	In Malabar iP — iS = 15 sec. △ = 120.	
220	19	"	I,	e M F	17 49 59 17 57 18 6		6		7.1	6.6		
221	19	"	I,	e M F	19 47 19 53 20 6						Felt in Lho Nga, Atjeh.	
222	21	"	I,	P S? M F	14 56 6 15 0 16 15 1 15 15		6	2600?	6.4	4.5		
225	22	"	I,	P S M	8 25 18 8 26 30 8 27		6	590	16.8	17.0	End overtaken by following earthquake.	
224	22	"	I,	P S M F	8 54 52 8 56 6 8 57 9 16		6	590	54.0	54.9		
225	24	"	I,	i P i S M F	12 1 30 12 7 48 12 8 28 13 53		6	4500	325.5	389.4		
226	26	"	I,	P S=M F	11 14 18 11 14 35 11 18			150				
227	28	"	I,	P S M F	1 55 58 1 54 26 1 55 1 45			450				

No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
228	28	Nov.	I,	P S M e L M <sub>L</sub> F	10 53 35 10 59 50 11 1 11 8 11 13 11 43		6 20	4500				
229	28	"	I	e M F	13 27 13 35 13 46							
250	29	"	I,	P M	5 5 55 5 7 55						End overtaken by following earthquake.	
251	29	"	I,	P i S M F	5 8 11 5 8 58 5 9 5 45		7	420	62.6	58.7		



# SEISMOLOGICAL BULLETIN.

## DECEMBER 1914.

### BATAVIA OBSERVATORY, JAVA.

Foundation: River Quair.

Mean Greenwich time. S. Latitude  $6^{\circ} 11' 0''$ . Height above sealevel 8 m.

E. Longitude  $7^{\text{h}} 7^{\text{m}} 19^{\text{s}}$ .

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

N <sup>o</sup> .	Date 1914.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A <sub>E</sub> .	A <sub>N</sub> .	
232	4	Dec.	I <sub>v</sub>	e P M F	h 8 8 8	m 30 32 36	s 45			μ	μ	
235	6	"	I <sub>v</sub>	P S = M F	5 5 5	22 22 26	14 59	220				Very small.
254	10	"	I <sub>v</sub>	i P M F	18 18 18	34 36 36	1	5		20.9	20.5	
255	12	"	I <sub>v</sub>	P S M F	3 3 3 3	36 36 37 51	4 28	220				
236	15	"	I	e M F	9 9 9	7 18 33		6		6.0	5.5	
237	16	"	I	e M F	1 2 2	57 3 16		6		6.7	9.6	
238	18	"	I <sub>v</sub>	P S M F	22 22 22 23	42 45 45 15	48 52	6	580	115.1	78.5	Felt in Manna, Lebong Tan- dai, res. Benkoelen and Pandang, Sumatra.
239	20	"	I <sub>v</sub>	e P S M e L M L <sub>1</sub> M L <sub>2</sub> F	14 14 14 14 14 15 15	10 50 32 45 50 5 23	59 51	9100?				
								6		15.5	16.8	
								50		70.1	47.0	
								18		24.1	22.7	
240	21	"	I	e M F	9 9 9	13 15 20		6		4.1	9.1	



No.	Date 1914.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.	
										A <sub>E</sub> .	A <sub>N</sub> .		
241	25	Dec.	I <sub>v</sub>	e P	h	m	s	5	150	μ	μ		
					19	55	28			6.0	5.1		
					S	19	55						45
					M	19	58						
F	20	4											
242	27	.	I <sub>v</sub>	e P	15	35	35	6	580				
					S	15	36			39	5.6		5.5
					M	15	38						
					F	15	42						
245	31	.	I <sub>v</sub>	e P	16	17	10		150			Very small	
					S	16	17			25			
					M	16	17			20			
					F	16	22						