

SEISMOLOGICAL BULLETIN 1915.

BATAVIA OBSERVATORY, JAVA.

PREFACE.

The astatic Seismograph of WIECHERT of 1000 K.G. has been registering regularly since December 6th 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 ϵ , 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.

1914.	E.-W. component.			N.-S. component.		
	V.	T_0 .	ϵ .	V.	T_0 .	ϵ .
January	217	11.8	5.1	186	11.8	4.8
February	"	11.3	5.2	"	10.9	5.6
March.	"	10.6	5.5	"	9.9	6.0
April.	"	10.6	4.8	"	10.6	4.8
May.	"	11.2	4.9	"	11.2	4.3
June.	"	8.1	4.3	"	8.3	4.0
July.	"	8.0	4.0	"	8.4	3.9
August.	"	7.4	3.3	"	7.5	3.3
September	"	7.2	3.4	"	7.2	3.5
October.	"	7.3	4.9	"	7.2	5.9
November	"	7.3	4.9	"	7.3	6.1
December.	"	7.2	4.8	"	7.1	6.1

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) = 1st preliminary tremors.

S (" secundae) = 2nd " "

L (" longae) = principal phase, long waves.

M (" maximae) = maximum amplitude.

C (coda) = prominent waves among the after tremors.

F (finis) = end of perceptible movement.

PR₁, PR₂, SR₁, SR₂, = 1st, 2nd 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_E = E.-W. component of A.

A_N = N.-S. " " "

i (impetus) = abrupt commencement, clearly defined.

e (emersio) = gradual " , not clearly defined.

Year	N.-S. component		E.-W. component		Remarks
	A	T	A	T	
1911	11.8	1.88	1.5	1.8	January
1912	10.0	"	2.2	1.3	February
1913	9.0	"	2.5	1.0	March
1914	10.0	"	1.8	"	April
1915	11.2	"	1.9	1.2	May
1916	8.8	"	1.6	1.1	June
1917	8.4	"	1.0	1.0	July
1918	7.5	"	1.3	1.4	August
1919	7.2	"	1.4	1.2	September
1920	7.2	"	1.0	1.3	October
1921	7.3	"	1.0	1.3	November
1922	7.1	"	1.8	1.3	December

SEISMOLOGICAL BULLETIN.

JANUARY 1915.

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 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.		
										A _E .	A _N .			
1	3	Jan.	I	e	h	m	s			μ	μ			
					F	0	18			0	25			
2	3	»	I	e	25	47		6.5		9.8	11.5			
					M	0							6	
					F	0							59	
3	5	»	II _u	i	P	14	45	7	6400	136.6	76.6			
					S	14	51						2	
					M	14	53							
					e	L	14						59	6
					M _L	15	4							
					F	15	54							
4	5	»	II _v	i	P	25	55	20	2800	123.6	136.4			
					S	25	57						47	
					M	25	42							
					e	L	25						54	6
					M _L	25	59							
					F	1	4							
5	7	»	I _v	i	P	8	42	30	180	42.6	28.7			
					S	8	42						50	
					M	8	45							
					F	8	55							
6	10	»	I _v	i	P	20	12	40	170	18.5	14.5			
					S	20	12						59	
					M	20	15							
					F	20	24							
7	12	»	I	e	17	6								
					F	17						24		
8	12	»	I _v	P	18	25	12	590	28.0	50.5		In Malabar: i P—i S = 47 sec. Δ = 540.		
					S	18							25	55
					M	18							30	
					F	18							59	

No.	Date 1915.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.	
										A _E .	A _N .		
9	15	Jan.	I	e	h	m	s	6		13.1	5.8		
					7	6	45						
					M	7	21						
					e L	7	51						
				M _L	7	53							
				F	8	30							
10	19	»	I	e	23	18		6		4.2	3.8		
					M	23	21						
					F	23	27						
11	20	»	I	e	4	11							
					F	4	19						
12	21	»	II _r	i P	15	8	56	6.5	2600	67.0	70.2		
					i S	15	13						7
					M	15	14						30
					F	15	37						
13	24	»	I _r	P	12	13	30		260?			In Malabar: △ = 360 End overtaken by following earthquake.	
					e S	12	13						59
					M	12	14						
14	24	»	I	S	12	15	0	6		5.4	4.5		
					M	12	15						51
					F	12	24						
15	27	»	I	e	1	34		6	9.6	6.2			
					F	1	36						
16	30	»	I	e	21	14	48	5	27.6	18.7		Felt in Toeren, res. Pasoe- roean, Poeger and Djem- ber, res. Besoeki, Blitar res. Kediri and Ngebel res. Madioen.	
					M	21	17						
					F	21	29						

SEISMOLOGICAL BULLETIN.

FEBRUARY 1915.

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 ^o .	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
17	1	Febr.	I	e	h	m	s			μ	μ	
				M	17	27	41	6				
				F	17	39	35					
					17	35						
18	6	"	II _v	i P	15	59	15		220			In Malabar:
				i S	15	59	35					P - S = 42 sec.
				M	16	1		6		108.1	121.6	$\Delta = 580.$
				F	19	16						
19	8	"	I	e	1	23						
				F	1	28						
20	10	"	I	e	14	18						
				F	14	27						
21	12	"	I	e	15	45						
				F	15	53						
22	13	"	I	e	21	14						
				F	21	25						
23	14	"	I _r	P	22	36	27		1980			Felt on the isle of Roti near
				i S	22	39	48	5.5		16.1	14.5	Timor.
				M	22	41	17					
				F	22	46						
24	20	"	I _r	i P	15	44	18		3400?			
				S?	15	49	29					
				M	15	50		6		14.7	8.5	
				F	15	57						
25	25	"	I _n	i P	20	46	52		7500			
				S	20	55	15					
				M	20	55		6		34.7	47.5	
				F	21	23						

SEISMOLOGICAL BULLETIN.

MARCH 1915.

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 ^o .	Date 1915.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
25	28	Febr.	I	e	h	m	s			μ	μ	End overtaken by following earthquake.
24	28	»	I _r	P	19	7	9	6.5	2700	25.1	25.8	
				S	19	11	20					
				M	19	11	33					
				L	19	22						
				F	19	32						
25	6	March.	I _v	P	20	14	16		150			In Malabar: P—S = 15 sec.
				i S	20	14	54					
				M	20	15		6		7.4	5.5	
				F	20	16						
26	8	»	I	e	15	40						
				F	15	44						
27	8	»	I	e	15	47						
				F	15	55						
28	10	»	I	P	0	51	1					Felt in Gorontalo, Celebes.
				M	0	58	3	6		70.1	77.2	
				F	1	18						
29	10	»	I	e	15	25						
				F	15	26						
30	11	»	I	P	0	16	39					Felt in Lebong Tandai, res. Benkoelen ² / ₄ Sumatra.
				M	0	19		6		29.2	28.5	
				F	0	35						
51	11	»	I	P	18	15	21					
				M	18	21						
				F	18	29						
52	12	»	I	e	2	24						
				F	2	30						
53	12	»	I _r	P	14	54	2		5500			
				S	14	58	36					
				M	14	59	57	5.5		55.0	71.5	
				eL	15	6						
				M _L	15	14		11				
				F	15	46						

No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
					h	m	s			μ	μ	
54	15	March.	I	e	8	17						
				F	8	24						
55	15	"	I	e	18	25						
				M	18	52						
				F	18	55						
56	14	"	I	e	12	9						
				F	12	14						
57	13	"	I _v	e	4	55						
				M	4	41						
				F	4	47						
58	17	"	I _v	P	18	52	0	500			In Malabar: P - S = 12 sec.	
				S	18	52	32					
				M	18	55						
				F	18	57						
59	17	"	I _u	iP	18	54	50	6000				
				S	19	2	42					
				M	19	5		6	28.4	28.6		
				F	19	17						
40	17	"	I	e	19	24						
				F	19	28						
41	18	"	I	e	2	21						
				M	2	24						
				F	2	56						
42	18	"	I	e	21	11						
				M ₁	21	21						
				F	21	27						
45	19	"	I _v	P	16	40	15	200				
				S	16	40	56					
				F	16	44						
44	25	"	I _v	P	18	55	55	470			Felt in Palembang, Sumatra.	
				S	18	56	49					
				M	18	57		6	15.9	16.5		
				F	18	59						
45	24	"	I _v	iP	22	6	17	150				
				S	22	6	54					
				M	22	9		6	218.3	265.3		
				F	22	26						
46	25	"	I	e	10	10						
				F	10	14						
47	26	"	I	e	5	42						
				F	5	55						
48	27	"	I _v	P	4	1	57	500				
				iS	4	2	50					
				M	4	2	52	6	9.7	24.5		
				F	4	7						

No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
					h	m	s			μ	μ	
49	27	March.	I	i	8	55	7					
				F	8	57						
50	28	"	I _v	P	4	56	9	470?			S somewhat uncertain.	
				S	4	57	1					
				F	5	0						
51	28	"	I	e	7	15	45				End overtaken by following earthquake.	
52	28	"	I _v	P?	7	15	56	400?			In Malabar: P - S = 52 sec.	
				S?	7	16	42	6	74.1	102.0	Felt in Lebong Tandai, res. Benkoelen Sumatra.	
				M	7	18						
				F	7	54						
53	29	"	I	e	17	24	52					
				M	17	27						
				F	17	57						
54	50	"	I _v	P	9	27	56	650				
				S	9	29	7					
				M	9	50		6	29.8	53.8		
				F	9	51						
55	50	"	I	P	25	4	24				In Malabar: P - S = 56 sec.	
				M	25	6		5	56.7	24.2	Felt in several places of Madioen, Java.	
				F	25	15						

SEISMOLOGICAL BULLETIN.

APRIL 1915.

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.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
56	3	April	I _r	P	h	m	s	6	1900?	82.9	99.4	
				S?	13	46	18					
				M	15	49	29					
				F	13	51						
57	3	"	I	e	20	55						
				F	21	0						
58	6	"	I _v	e P	20	52	15		570			Felt in Gondang Lipoero res. Djokjakarta.
				S	20	55	16					
				M	20	54						
				F	20	57						
59	7	"	I	e	14	51						
				F	15	2						
60	7	"	I	e	16	14						
				F	16	24						
61	9	"	I _r	P	2	27	54	4.5	1450?	37.8	58.8	Felt on the isle Kangean E. of Madoera.
				S?	2	30	26					
				M	2	32						
				F	2	55						
62	9	"	I	e	15	25						
				M	15	26						
				F	15	28						
63	12	"	I	e	15	12					Small.	
				F	15	15					Felt in Ambon.	
64	15	"	I	e	4	21					Small.	
				F	4	29					Felt in Donggala, Celebes.	
65	16	"	I	e	4	22					Small.	
				F	4	30					Felt in Gorontalo, Celebes.	
66	16	"	II _v	i P	14	2	54	6.5	440	251.5	501.1	Direction S E — NW. Felt in the Government: Sumatra's W. coast and Benkoelen
				S	14	5	22					
				M	14	7						
				F	14	50						

No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
67	19	April	I _v	e P S M F	h 9 9 9 9	m 56 56 38 41	s 32 57	200	μ	μ	In Malabar: P — S = 15 sec.	
68	19	"	I _v	e P S M F	10 10 10 10	51 51 52 56	19 35	150			In Malabar: P — S = 12 sec. Felt in Goenoeng Walet, Preanger, Java.	
69	20	"	I	e M F	12 12 12	7 8 10						
70	22	"	I	e M F	16 16 16	6 8 12						
71	22	"	I _v	e P S? M F	18 18 19 19	56 59 4 38	6 32	2000?			6 30.9 30.1	
72	25	"	I _v	e M F	15 16 16	48 5 26						
75	24	"	I _v	e P e S F	17 17 17	20 26 35		4000?				
74	25	"	I _u	i P S M F	0 0 0 0	8 17 18 50	18 1	7500			5 10.6 12.5	Direction SE — NW.
75	26	"	I _v	e P S M F	7 7 7 7	8 12 15 23	48 52	2500			6 8.0 15.1	
76	27	"	I	e F	11 11	36 50						
77	28	"	I _v	e M M _L F	3 3 3 3	28 45 47 57						
78	29	"	I _v	P S? M F	22 22 22 22	18 19 20 29	31 44	650?			5 24.7 16.5	
79	30	"	I _v	e M _L F	1 2 2	54 17 50	5					

SEISMOLOGICAL BULLETIN.

MAY 1915.

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 _E .	A _N .	
80	30 1	April May	I _r	P	h	m	s	6	1260	μ	μ	
				S	25	59	24			13.7	5.6	
				M	0	1	39					
				F	0	13						
81	1	"	II ⁿ	i P	5	11	13	6.5	7750	169.1	242.5	Direction S E — NW.
				i S	5	20	16					
				M	5	21						
				e L	5	32						
				ML ¹	5	53						
				ML ²	6	1						
82	1	"	I ⁿ	P	8	55	4	6	7750	7.1	5.6	
				S	9	4	7					
				M	9	5						
				ML	9	55						
83	1	"	I ⁿ	P	10	41	48		7750			
				S	10	50	52					
				M	10	51						
				F	10	2						
84	3	"	I	e	3	25						
				M	3	54						
				F	4	0						
85	3	"	I _r	P	4	8	8	6.5	2400	52.7	40.6	
				S	4	12	0					
				M	4	13						
				F	5	18						
86	3	"	I	e	12	16						
				M	12	21						
				F	12	39						
87	3	"	I	e	21	54						
				M	21	59						
				F	22	14						

No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.	
										A _E .	A _N .		
88	4	May	I _r	P	h	m	s		180	μ	μ		
					15	34	10						
					iS	15	34			30			
					M	15	36						
89	5	"	I _r	eP	11	14	18	6	4500?	25.1	25.8		
					S?	11	20						24
					M	11	23						
					F	12	13						
90	5	"	I	e	15	20							
					M	15							37
					F	16							16
91	5	"	I _r	iP	22	20	9	6	250	121.4	159.1	Direction ESE — WNW.	
					iS	22	20						58
					M	22	22						
					F	22	38						
92	8	"	I	e	5	18							
					F	5							33
93	8	"	I	eL	14	18							
					F _L	14							29
94	12	"	I	e	10	51	44	24	21	18			
					ML ₁	11							25
					ML ₂	11							34
					ML ₃	11							37
					ML ₄	11							58
					F	12							8
95	14	"	I _a	eP	6	52	21	6	7000			Small.	
					S	7	1						4
					M	7	2						
					F	7	17						
96	14	"	I _r	eP	15	39	29		880				
					S	15	40						55
					M	15	42						
					F	15	46						
97	15	"	I _r	eP	9	41	12		250			In Malabar: P — S = 19 sec.	
					S	9	41						41
					M	9	43						
					F	9	47						
98	16	"	I	e	14	0							
					F	14							16
99	21	"	I _a	eP	4	30	55	6	8200	4.7	8.5		
					S	4	40						35
					M	4	41						
					F	5	10						

No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.	
										A _E .	A _N .		
100	21	May	I	e	h	m	s			μ	μ		
					12	25	4						
101	21	"	I	e	18	5							
					F	18							8
102	22	"	I	e	2	5							
					M	2							7
					F	2							12
103	22	"	I	e	11	11							
					F	11							18
104	25	"	I _r	P	19	45	19	6	700				
					S	19	44						37
					M	19	46						
					F	19	56						
105	26	"	I _r	eP	20	40	45	6	2500			Malabar: P — S = 4 min. 4 sec. Felt in Banda-Neira.	
					S	20	44						51
					M	20	45						
					F	21	1						
106	28	"	I _r	eP	15	50	7	5	1500				
					S	15	32						45
					M	15	35						
					F	15	46						
107	28	"	I	e	20	45					Small.		
					F	20						46	
108	30	"	I _r	eP?	9	50	14						
					S	9	51						10
					M	9	52						
					F	9	59						

SEISMOLOGICAL BULLETIN.

JUNE 1915.

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.

N ^o .	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
109	1	June	I	eL F	h 15 15	m 42 48	s			μ	μ	
110	2	"	I _v	eP iS M F	5 5 5 5	37 40 41 45	44 7	6	1350	7.2	7.2	
111	4	"	I _v	P? S M F	6 6 6 6	56 56 59 48	57 58	5	180?	11.9	11.5	
112	4	"	I	e M F	22 22 22	16 18 23						
113	6	"	I	P M F	19 19 20	45 55 0	21	5		5.7	4.8	
114	6	"	I	P M M _L F	21 22 22 23	49 12 55 55	19	8		108.5	48.0	Malabar: P — S = 3 min. 47 sec.
115	7	"	I _v	iP S F	1 1 1	22 22 25	26 53		240			
116	8	"	I	e M F	5 5 5	5 5 15						
117	11	"	I	e M F	6 6 6	50 40 44						
118	14	"	I	e M F	3 3 3	59 45 45						
119	14	"	I	e M F	3 3 3	48 50 53						

N ^o .	Date 1915.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
					h	m	s			μ	μ	
120	17	June	I	P M F	23 23 23	38 45 57	55	6		7.5	5.5	
121	18	"	I _v	P S F	5 5 5	55 55 58	40		120			Felt in Lebak Parai, Ban- tam.
122	21	"	I _v	P S M F	1 1 1 2	55 55 54 5	5	5	250	29.8	29.2	
123	22	"	I	e M F	3 3 3	45 50 52						
124	22	"	I _v	eP iS M F	10 10 10 10	0 0 1 3	42 54		120			
125	22	"	I _v	P iS M F	18 18 18 18	4 4 4 8	22 35 35		120			Malabar: P — S = 14 sec. Felt in Goenoeng Walet, Preanger.
126	23	"	I _v	eP eS M F	21 21 21 21	32 35 38 48	1 45	6	2 200	27.0	30.9	
127	24	"	I _v	P iS M F	3 3 3 3	34 35 36 39	29 8		350			Malabar: P — S = 19 sec. Felt in Karangjar, Ke- doe and Banjoemas.
128	25	"	I _v	P? iS M F	14 14 14 14	5 5 6 8	11 32		190?			Felt in Djamboe, res. Ban- joemas.
129	27	"	I	e F	14 14	45 48						
150	29	"	I	e F	15 14	46 2						
151	30	"	I _v	eP S M F	16 16 16 16	18 19 20 21	11 10		350			

SEISMOLOGICAL BULLETIN.

JULY 1915.

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 ^o .	Date 1915.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
152	2	July	I	e	h	m	s			μ	μ	
				F	13	55						
				F	13	42						
153	5	"	I _v	P	1	51	18		270			Malabar:
				S	1	51	47					P — S = 34 sec.
				M	1	52						
				F	1	56						
154	4	"	I _r	P	1	54	4		2200?			
				S?	1	57	51					
				M	2	0		6		13.9	13.5	
				F	2	8						
155	8	"	I _v	P	16	48	22		400?			P a little uncertain by
				S	16	49	8					hourmark.
				M	16	49	41					
				F	16	52						
156	8	"	I _n	e P	22	29			5500			
				e S	22	36						
				M	22	37						
				F	22	45						
157	9	"	I	P	15	45	41					
				F	15	46						
158	11	"	I	P	16	41	47					Malabar:
				M	16	45	55	5		1.05	8.5	P — S = 45 sec.
				F	16	57						
159	12	"	I _v	P	5	41	26		450			Malabar:
				S	5	42	16					P — S = 55 sec.
				M	5	45		5		18.8	15.2	
				F	5	57						
140	14	"	I _v	P	4	49	24		750			
				S	4	50	47					
				M	4	51		6		11.1	7.0	
				F	4	59						
141	19	"	I	P	2	13	5					
				M	2	14		5		7.7	5.2	
				F	2	15						

No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
142	20	July	I	e	4	42			μ	μ		
				F	4	46						
143	21	"	I _v	P	4	10	5	750			Malabar:	
				iS	4	11			21.4	25.5	P - S = 69 sec.	
				M	4	15						
				F	4	20						
144	24	"	I _v	P	16	27	6	750				
				S	16	28			8.0	7.2		
				M	16	29						
				F	16	35						
145	24	"	I	e	19	22						
				M	19	24						
				F	19	29						
146	25	"	I	e	6	54	7		9.5	10.1		
				M	6	56						
				F	7	7						
147	31	"	I _v	P	20	41	5	260			Malabar:	
				S	20	42			40.5	24.4	P - S = 35 sec.	
				M	20	44					Felt in in Kota Agoeng,	
				F	20	53					Sumatra.	

SEISMOLOGICAL BULLETIN.

AUGUST 1915.

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.

N ^o .	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
148	1	Aug.	I	M F	h 2 2	m 2 10	s			μ	μ	
149	5	"	I	P M F	13 13 13	10 18 55	56	6.5		69.8	90.2	Malabar: P — S = 4 min. 41 sec.
150	6	"	I	i P M F	13 13 13	22 26 47	49	6		8.1	8.9	
151	6	"	I	e F	13 14	53 1						
152	7	"	I	e M F	15 15 15	18 29 59						
153	9	"	I	e F	12 12	45 52						
154	10	"	I	e M F	2 2 2	27 29 56						
155	10	"	I	e F	14 15	58 3						
156	11	"	I	e M F	9 9 9	24 57 44		6		9.8	11.3	
157	12	"	II _r	i P S M F	7 7 7 8	59 42 45 51	27 42		1800			S uncertain. Malabar: P — S = 2 min. 2 sec.
158	12	"	I	P M F	9 9 9	25 29 3	51	6		50.9	52.7	

No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
159	12	Aug	I _r	P	h	m	s		2100?	μ	μ	Malabar: P - S = 2 min. 55 sec.
				S?	15	38	1					
				M	13	41	39					
				F	13	45						
160	15	"	I _v	P	19	4	12	6	270	5.9	6.2	
				S	19	4	42					
				M	19	6						
				F	19	10						
161	15	"	I _r	P	22	35	6	6	360	13.7	17.6	
				S	22	35	48					
				M	22	38						
				F	22	51						
162	17	"	I	e	14	17						
				F	14	25						
163	17	"	I	e	20	45						
				F	20	50						
164	18	"	I _r	e P	12	28	34	5	2500	11.2	6.6	
				S	12	32	38					
				M	12	35						
				F	12	42						
165	21	"	I _v	P	17	2	4		360			
				S	17	2	47					
				F	17	6						
166	31	"	I _v	P	20	44	16	6.5	650	42.1	37.0	End overtaken by following earthquake.
				S	20	45	27					
				M	20	55						
167	31	"	I _r	P	21	12	3	6	1800	21.5	24.8	
				S	21	15	16					
				M	21	18						
				F	21	55						

SEISMOLOGICAL BULLETIN.

SEPTEMBER 1915.

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 ^o .	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.	
										A _E .	A _N .		
168	1	Sept.	I	P	h	m	s	6		μ	μ		
				M	1	9	15			8.6	7.0		
				eL	1	11	25			12			
				F	1	34	39						
169	5	"	I	P	22	51	59	6.5		50.5	45.5		
				M	22	56	27						
				eL	22	13							
				F	22	19							
170	5	"	I	iP	12	17	29	6		39.2	41.8	Direction S W—N E.	
				M	12	25							
				F	12	44							
171	6	"	I	e	15	22							
				F	15	25							
172	6	"	I	e	17	38	6		8.2	5.2			
				M	17	48							
				F	18	25							
173	7	"	I	P	1	41	52	6		46.6	37.0		
				M	1	54							
				eL	2	12	21				184.8		175.7
				M _L	3	4							
				F	4	38							
174	7	"	I	P	15	15	48	250					
				iS	15	16	19						
				F	15	21							
175	10	"	I	P	8	46	27						
				M	8	49							
				F	8	52							
176	10	"	I	e	14	22							
				F	14	30							
177	12	"	I	iP	0	5	11	6	1900			Direction E N E—W S W. Malabar: P—S = 3 min. 7 sec.	
				iS	0	6	19			75.7	121.2		
				M	0	6	28						
				F	0	56							

No.	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
					h	m	s			μ	μ	
178	12	Sept.	I	P	16	15	25					
				M	16	19						
				F	16	29						
179	12	"	I	e	21	4						
				F	21	12						
180	17	"	I	P	4	29						
				M	4	38						
				F	4	48						
181	19	"	I	e	14	51						
				M	14	53						
				F	15	0						
182	22	"	I _v	P	15	4	38		350			
				S	15	5	18					
				M	15	6						
				F	15	9						
183	25	"	I	e	8	26						
				M	8	37						
				F	8	46						

SEISMOLOGICAL BULLETIN.

OCTOBER 1915.

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 ^o .	Date 1915.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
					h	m	s			μ	μ	
184	1	Oct.	I	e	16	31						
				F	16	38						
185	1	"	I	e	19	54						Felt at Praja, Lombok.
				F	20	0						
186	2	"	I	e P	2	5	37	6		16.8	19.2	Malabar: P — S = 1 min. 45 sec.
				M	2	10						
				F	2	20						
187	5	"	I	e	7	13		18		55.8	65.2	
				e L	7	40						
				M _L	8	13						
				F	9	8						
188	5	"	I _u	i P	15	58	6		7200			Direction SE—N W.
				i S	14	6	45					
				M	14	7		6		51.7	74.0	
				F	14	39						
189	8	"	I _u	P	15	44	32		5000			
				S	15	51	12					
				M	15	52		6		15.7	12.6	
				F	16	3						
190	12	"	I _v	P	7	4	27					Malabar: P — S = 11 sec.
				M	7	7		6		65.4	50.5	
				F	7	38						
191	15	"	I _v	e	8	39						Malabar: P — S = 11 sec.
				F	8	42						
192	17	"	I	i	1	25	7					Direction SE--N W.
				F	1	29						
193	21	"	I _v	P	1	2	58		900			
				S	1	4	58					
				M	1	6		6		55.7	26.1	
				F	1	20						
194	23	"	I	e	11	55						
				F	12	6						
195	31	"	I	e	5	57						
					6	2						

SEISMOLOGICAL BULLETIN.

NOVEMBER 1915.

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.

N ^o .	Date 1915.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.	
										A _E .	A _N .		
196	1	Nov.	I _u	P	7	55	57	6.5	5800	μ	μ	Direction S E—N W.	
				S	7	41	17			15	45.6		52.5
				M	7	42					88.6		150.6
				e _L	7	54							
				M _L	8	8							
F	9	8											
197	1	"	I _u	P	9	9	52	6.5	5800				
				S	9	17	38			15	16.6		19.0
				M	9	19							
				M _L	9	44							
				F	9	59							
198	6	"	I	e	9	41							
				F	9	51							
199	8	"	I _v	G	11	8	47	6	510?				
				S?	11	9	46			16.5	13.9		
				M	11	11							
				F	11	17							
200	10	"	I _v	P	1	52	19		160			Malabar: P—S = 15 sec. Felt at several places in Preanger and Bantam.	
				S	1	52	55						
				F	1	57							
201	10	"	I _v	G	11	12	16		180			Malabar: P—S = 16 sec.	
				S	11	12	56						
				F	11	19							
202	13	"	I	e	11	0							
				M	11	6							
				F	11	12							
203	13	"	I	e	12	45							
				F	12	57							
204	15	"	I	e	15	45							
				F	15	49							
205	14	"	I	e	15	52							
				F	15	57							
206	16	"	I _v	G	11	40	21		160			Malabar: P—S = 16 sec.	
				S	11	40	58						
				F	11	45							

No.	Date 1915.		Character.	Phase	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
207	17	Nov.	I _v	P	9	57	55	5.5	160	75.5	60.2	Direction W S W--E N E.
				S	9	58	12					
				M	10	0						
				F	10	9						
208	18	"	I _u	P	4	12	4	6	6000	15.5	15.7	
				S	4	19	48					
				M	4	22						
				M _L	4	45						
209	18	"	I	P	20	25	12	6		19.1	21.8	Felt at Ponorogo, res. Madioen
				M	20	52						
				F	20	58						
210	24	"	I	e	14	51						
				F	14	58						
211	26	"	I	P	4	57	54					
				M	4	40						
				F	4	45						
212	27	"	I _v	e P	4	20	10	6	350?	28.0	51.4	Malabar: P - S = 10 sec.
				S?	4	20	46					
				M	4	25						
				F	4	55						
215	30	"	II _v	P	17	45	17	6	640	142.6	518.8	Direction E-W. Malabar P - S = 55 sec. Felt in the cy Madioen
				S	17	44	27					
				M	17	46						
				F	18	8						

SEISMOLOGICAL BULLETIN.

DECEMBER 1915.

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 ^o .	Date 1915.		Cha- racter.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
214	2	Dec.	I	e	h	m	s			μ	μ	Malabar: P—S = 40 sec.
				M	25	18						
				F	25	20						
215	5	"	I	e	1	29						
				F	1	35						
216	5	"	II _v	P	1	39	40	6	180	221.7	264.6	Direction E—W. Malabar P—S—58 sec.
				S	2	0	0					
				M	2	2						
				F	2	18						
217	5	"	I	eP	2	46	53	6		18.0	23.1	
				M	2	48						
				F	3	55						
218	5	"	I _v	eP	11	6	47		200?			
				S	11	7	10					
				F	11	11						
219	7	"	I	e	10	56						
				F	11	5						
220	11	"	I	e	4	13						
				F	4	25						
221	15	"	I	e	5	23						
				F	5	28						
222	16	"	I _v	P	10	49	5		180			
				S	10	49	24					
				F	10	57						
223	17	"	I	e	7	15						
				e _L	7	39						
				M _L	7	42						
				F	7	55						
224	17	"	I	e	8	41						
				F	8	55						

N ^o .	Date 1915		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epi- centrum.	Amplitude (half)		Remarks.
										A _E .	A _N .	
225	17	Dec.	I _v	P	h	m	s		550	μ	μ	
				S	16	51	55					
				M	16	52	53					
				F	16	54						
					17	5						
226	19	"	I _v	P	20	16	55		580?			
				S?	20	17	58					
				M	20	25		6		61.7	57.8	
				F	20	45						
227	22	"	I	e	11	35						
				F	11	48						
228	28	"	I	e	25	58						
	29	"		M	0	4						
				F	0	25						
229	31	"	I _v	P	25	5	52		560?			Direction ESE—WNW.
				S?	25	6	52					End overtaken by following
				M	25	7		5		31.7	59.7	earthquake.
250	31	"	I	S	25	14	51					
				M	25	15		6		92.2	91.5	
				F	25	46						