SEISMOLOGICAL BULLETIN 1918.

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 galeries 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_o and ε, the oscillation period and the coefficient of damping, are determined every week. V, the magnification for very short waves, is determined occasionely 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.

1917.	E-W component.			N-S component.		
	V.	T_o.	ε.	V.	T_o.	ε.
January	218	7.0	4.5	195	7.2	5.0
February	„	„	5.2	„	„	5.4
March	„	7.1	5.7	„	7.0	„
April	„	7.4	6.2	„	„	5.2
May	„	„	5.0	„	„	5.6
June	„	„	5.4	„	„	5.2
July	„	„	5.2	„	7.1	5.1
August	„	„	6.0	„	7.4	5.9
September	„	6.9	„	„	6.8	„
October	„	6.6	4.7	„	6 6	5.5
November	„	6.7	4.4	„	„	5.4
December	„	6.8	4.7	„	„	„

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.
PR_1, PR_2, ... SR_1, SR_2, ... = 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.

SEISMOLOGICAL BULLETIN.

JANUARY 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Longitude 7h 7m 19s.
Wiechert Horizontal Pendulum, 1000 kilograms.
The symbols are according to Wiechert.

No.	Date 1918.		Character.	Phase.	Time (Greenwich). h m s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	Amplitude (half) A_N μ	Remarks.
1	2	Jan.	I,	P	18 49 40		220			Malabar:
				S	18 50 5					iP = 18 49 23
				M	18 51	6.0		12.1	8.1	iS = 28 49 23
				F	18 56					△ = 95 K.M.
2	2	»	I	e	19 24					
				F	19 28					
3	4	»	I	e	15 57					
				F	16 26					
4	9	»	I,	P	11 15 21		320?			P a little uncertain.
				S	11 15 57					
				M	11 17	7.0		15.0	19.6	
				F	11 27					
5	12	»	I	e	18 52 24					
				F	19 17					
6	15	»	I,	iP	5 3 31		140			Malabar:
				iS=M	5 3 47	2.0		34.9	66.7	P — S = 4 sec.
				F	5 11					△ = 43 K.M.
7	16	»	I	e	2 35 9					Felt on Soembawa, Soemba and Lombok.
				M	2 39	5.5		27.8	17.4	
				F	2 59					
8	18	»	I	P	11 38 59					
				M	12 43	4.0		25.1	23.1	
				F	12 5					
9	21	»	I	e	19 51 17					
				M	19 57	4.5		28.2	28.4	
				F	20 12					
10	22	»	I	e	1 33					
				F	1 57					
11	28	»	I	e	14 48					
				F	14 57					
12	28	»	I	e	22 32					
				F	22 41					

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
					h	m	s			A_E	A_N	
										μ	μ	
13	30	Jan.	II,	i P	20	45	4		340			Direction E S E - W N W.
				i S	20	45	42					
				M	20	47		4.9		211.—	236.—	
				F	21	12						
14	30	»	I	i P	21	27	56					Felt at Telok-Betong and Way Lima, Sumatra.
				M	21	35		5.6		101.—	189.—	
				F	22	22						
15	31	»	I_V	P	4	26	3		70			Felt at Naringgoel, Tjianten and Buitenzorg res. Batavia.
				S	4	26	11					
				M	4	27		2.0		38.8	25.8	
				F	4	30						

SEISMOLOGICAL BULLETIN.

FEBRUARY 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Longitude 7h 7m 19s.

WIECHERT Horizontal Pendulum, 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A_E	A_N	
					h	m	s			μ	μ	
16	2	Febr.	I_v	P	20	20	19		160?			Very small, therefore P uncertain.
				S=M	20	20	37	2.0		8.7	15.1	Malabar:
				F	20	24						P — S = 5 sec.
												△ = 50
17	3	»	I_v	P	11	12	52		240			Malabar:
				S	11	13	19					P — S = 14 sec.
				M	11	15		2.9		8.6	11.7	△ = 135
				F	11	20						
18	4	»	I	e	18	18						Some small long waves.
				F	18	28						
19	5	»	I	e	3	34	53					
				M	3	36		5.0		7.6	6.5	
				F	3	42						
20	7	»	II_r	iP	5	25	28		1970			
				S	5	28	48					
				M	5	29	48	5.5		259.—	249.—	
				F	6	17						
21	8	»	I_v	iP	0	40	16		160			Malabar: P — S = 23.5 sec.
				iS	0	40	34					△ = 225
				M	0	40	48	2.0		23.5	15.1	Felt at Pitjoeng-Poeger, Preanger and at Tjemara, Bantam.
				F	0	47						
22	8	»	I_v	iP	15	14	51		155			Malabar:
				iS = M	15	15	8	2.2		73.0	24.6	iP — iS = 21 sec.
				F	15	24						△ = 190
23	9	»	I	e	21	1						
				F	21	10						
24	12	»	I	e	3	3	23					Felt at Tandjoeng Poera, Sumatra's Oostkust and in Tapanoeli.
				M	3	8		5.0		36.6	34.9	
				F	3	27						
25	12	»	I	e	11	44						
				M	11	51		6.0		5.6	5.4	
				F	12	0						

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
					h	m	s			A_E	A_N	
										μ	μ	
26	13	Febr.	III_v	i P	2	32	43		410			At 2^h 33^m 50' pens thrown off.
				i S	2	33	28					
				M	2	33	49	6.0		334.—	384.—	Record restored at 5^h 56^m.
												Malabar: i P — S = 34 sec.
												Δ = 310
27	13	»	II	P	6	13	36					
				M	6	25		6.4		53 4	97.7	
				F	7	27						
28	13	»	I	e	22	1						
				M	22	7		6.0		24.9	17.2	
				F	22	27						
29	19	»	I	e	16	27						
				F	17	12						
30	21	»	I_v	P	4	14	24		175			Small.
				S	4	14	44					Malabar: i P — i S = 10 sec.
				M	4	16						Δ = 90
				F	4	20						
31	24	»	I	e P	15	34						
				M	15	36		5.0		32.6	23.3	
				F	15	47						
32	27	»	I	i	9	56	52					
				M	10	2		6.0		20.1	23.5	
				F	10	15						
33	27	»	I	e	15	21						
				F	15	30						

SEISMOLOGICAL BULLETIN.

MARCH 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Longitude 7^{h} 7^{m} 19^{s}.
WIECHERT Horizontal Pendulum, 1000 kilograms.
The symbols are according to WIECHERT.

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A_E	A_N	
					h	m	s			μ	μ	
34	3	March	I_v	P	14	15	46		260			Malabar: i P — i S = 15 sec.
				S	14	16	11					$\triangle$ = 130
				M	14	17		5.8		33.2	28.9	Felt at Cheribon.
				F	14	29						
35	10	»	I	e	14	28						
				F	14	42						
36	14	»	III_v	i P	9	21	59		260			Direction N-S.
				i S	9	22	28					E-W pen thrown off at
				M	9	23	59	5.0		329.—	388.—	9^{h} 23^{m}.
				F	9	47						Malabar: i P — i S = 20 sec.
												$\triangle$ = 180
												Direction S W — N E.
												Felt at several places in Batavia and Preanger.
37	16	»	I	e	13	55						
				F	14	30						
38	17	»	I	e	17	25						Felt at Tandjoeng Redeb and Tarakan, Borneo.
				F	17	43						
39	19	»	I	e	6	5						
				F	6	19						
40	22	»	I	e	7	53	9					
				F	8	1						
41	22	»	I	P	14	41	25					
				M	14	43		4.8		9.3	11.3	
				F	14	51						
42	24	»	I	P	5	19	12					
				F	5	27						
43	24	»	II_v	P	21	59	27					Malabar:
				S?	22	0	14					i P — i S = 30 sec.
				M	22	2		5.2		107.4	84.6	$\triangle$ = 275
				F	22	24						
44	26	»	I_v	e P	8	13	53		430			Malabar: i P — i S = 30 sec.
				S	8	14	40					$\triangle$ = 275
				M	8	16		6.0		18.1	17.8	
				F	8	31						

No.	Date 1918.		Character.	Phase.	Time (Greenwich).	Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
								A_E	A_N	
					h m s			μ	μ	
45	27	March	I	eP	12 15 11		360?			P uncertain.
				S	12 15 51					
				M	12 19	6.0		15.9	11.9	
				F	12 25					
46	31	»	I	e	10 7					
				F	10 10					

SEISMOLOGICAL BULLETIN.

APRIL 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Longitude 7^h 7^m 19^s.
WIECHERT Horizontal Pendulum, 1000 kilograms.
The symbols are according to WIECHERT.

No.	Date 1918.	Character.	Phase.	Time (Greenwich). h m s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	Amplitude (half) A_N μ	Remarks.
47	1 April	I_v	P	22 56 28		200			Very small.
			S	22 56 50					
			M	22 58					
			F	23 2					
48	3 »	I_v	iP	15 8 35		150?			Malabar: eP — S = 16 sec.
			S?	15 8 52					△ = 140
			M	15 11	5.0		53.7	48.8	
			F	15 23					
49	6 »	I	e	4 28					Felt at Pakoean Ratoe, Sumatra.
			M	4 34					
			F	4 43					
50	10 »	II	P	2 12 27					
			i	2 19 17					
			M	2 19 30	6.0		172.9	175.3	
			F	2 46					
51	12 »	I_v	iP	9 40 54		160			Malabar: iP — iS = 24 sec.
			iS	9 41 12					△ = 220
			M	9 42 1	4.8		39 4	43.6	
			F	9 49					
52	13 »	I	iP	0 56 6					
			M	1 7	6.4		27.4	36.6	
			F	1 53					
53	13 »	II_v	P	1 59 12		190			Malabar: iP — iS = 12 sec.
			S	1 59 33					△ = 110
			M	2 2	5.8		143.8	185.5	
			F	2 22					
54	13 »	I	e	11 55					
			F	11 45					
55	23 »	I	P	15 50 57					
			M	15 58	6.0		12.0	16.4	
			F	16 0					
56	25 »	II_v	iP	18 45 14		200			Direction N-S.
			iS	18 45 37					Malabar: iP — S = 8 sec.
			M	18 47	5.6		331.0	192.7	△ = 65
			F	18 59					S a little uncertain by minute mark.

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
					h	m	s			A_E	A_N	
										μ	μ	
57	25	April	I	e	22	50						
				M	22	55		5.5		15.5	20.3	
				F	23	10						
58	29	»	I_V	P	9	22	14					
				S	9	22	58					
				M	9	24	1	5.8		5.7	9.0	
				F	9	28						

SEISMOLOGICAL BULLETIN.

MAY 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Longitude 7h 7m 19s.
WIECHERT Horizontal Pendulum, 1000 kilograms.
The symbols are according to WIECHERT.

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A_E	A_N	
					h	m	s			μ	μ	
59	4	May	I	e	6	12						
				M	6	20		5.5		5.7	6.6	
				F	6	48						
60	6	»	I	e	8	49						
				F	8	59						
61	8	»	II,	iP	16	30	51		195			Malabar: P — S = 40 sec.
				iS	16	31	12					△ = 360
				M	16	33		6.0		193.5	203.—	
				F	16	47						
				No record from May 10, 14h 44m till May 11, 2h 34m.								
					h	m	s			μ	μ	
62	13	May	I	e	3	49						
				F	3	59						
				No record from May 14, 0h 18m till 3h 48m.								
										μ	μ	
63	19	May	I	e	0	38						
				F	0	49						
64	19	»	I,	iP	13	0	38		160			Malabar: iP — iS = 14 se
				iS	13	0	58					△ = 135
				M	13	3		4.2		18.4	18.3	Felt at Lebak Parai, B
				F	13	7						tam.
65	20	»	I	e	14	55	46					
				M	15	4		6.0		13.8	12.3	
				e_L	15	48						
				M_{L1}	16	4						
				M_{L2}	16	32						
				F	16	58						
66	20	»	I	P	18	10	50					
				S	18	12	10					
				M	18	13	13	6.6		56.2	42.3	
				F	18	51						

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A_E	A_N	
					h	m	s			μ	μ	
57	25	April	I	e	22	50						
				M	22	55		5.5		15.5	20.3	
				F	23	10						
58	29	»	I_V	P	9	22	14					
				S	9	22	58					
				M	9	24	1	5.8		5.7	9.0	
				F	9	28						

SEISMOLOGICAL BULLETIN

JUNE 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Longitude 7h 7m 19s.
WIECHERT Horizontal Pendulum, 1000 kilograms.
The symbols are according to WIECHERT.

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
					h	m	s			A_E	A_N	
										μ	μ	
72	3	June	I	e	1	9						
				F	1	23						
73	4	»	I	e	4	11						
				M	4	21		6.0		6.1	6.7	
				F	4	40						
74	4	»	I	e	17	23						
				F	18	18						
75	6	»	I	e	18	23						
				F	18	43						
76	8	»	I	P	20	18	42		2520?			
				S?	20	22	49					
				M	20	24		6.4		24.9	26.1	
				F	20	53						
77	10	»	I	e	15	45						
				M	15	53		5.5		10.5	14.7	
				F	16	8						
78	12	»	I_v	P	23	28	47		105			Malabar: i P — i S = 13 sec.
				i S=M	23	28	58					△ = 120
				F	23	33						
79	13	»	I_v	P	16	34	6		230			
				S	16	34	31					
				M	16	37		4.3		10.2	11.2	
				F	18	42						
80	16	»	I	e	5	20						
				M	5	29		6.2		10.9	8 2	
				F	5	48						
81	16	»	I_v	i P	15	49	41		335			Direction E-W.
				S	15	50	18					Malabar: i P — i S = 33 sec.
				M	15	52		5.3		75.3	65.6	△ = 300
				F	16	2						
82	21	»	I	e	15	33						
				M	15	39		4.5		19.7	17.0	
				F	15	48						
83	26	»	I	e	5	10						
				F	5	20						
84	29	»	I	e	4	31						
				M	4	35		6.4		63.9	91.	
				F	5	8						

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
										A_E	A_N	
					h	m	s			μ	μ	
85	30	June	I.	iP	4	2	8		240			
				iS	4	2	36					
				M	4	4		5.2		64.0	82.6	
				F	4	18						
86	30	»	I	eP	5	36	47					
				S	5	37	22					
				M	5	39		5.2		19.6	25.5	
				F	5	48						

SEISMOLOGICAL BULLETIN.

JULY 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Longitude 7h 7m 19s.
WIECHERT Horizontal Pendulum, 1000 kilograms.
The symbols are according to WIECHERT.

No.	Date 1918.		Character.	Phase.	Time (Greenwich).			Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E	Amplitude (half) A_N	Remarks.
					h	m	s			μ	μ	
87	1	July	II,	P	6	3	51		2810			
				S	6	8	20					
				M	6	11		6.2		77.9	99.3	
				F	7	14						
88	2	»	I,	e	3	41						
				M	3	44		5.8		5.7	7.0	
				F	3	53						
89	3	»	II,	i P	6	59	11		890			Direction E-W
				i S	7	0	48					
				M	7	10		6.5		139.6	165.7	
				F	9	8						
90	8	»	III	P	10	28	54					
				M	10	38		6.0		325.0	267.3	
				F	12	8						
91	9	»	I	e	2	1						
				M	2	6		6.0		7.4	18.1	
				F	2	16						
92	9	»	I	e	3	10						
				F	3	20						
	16	»	I,	P	2	15	41		150			Malabar: i P — i S = 13 sec.
93				S	2	15	58					△ = 120
				M	2	18		4.0		14.5	24.0	Felt at Pitjoeng-Poeger, Preanger.
				F	2	23						
94	16	»	I	e	20	26						
				F	20	34						
95	20	»	I,	i P	11	5	14		290			Malabar: P — S = 23 sec.
				i S	11	5	46					△ = 300
				M	11	7		5.6		86.8	124.9	Felt at Pitjoeng-Poeger, Preanger.
				F	11	23						
96	21	»	I	e	6	18						
				M	6	38		6.0		14.1	20.3	
				F	7	18						
97	21	»	I	e	9	53						
				F	10	10						
98	24	»	I,	i P	5	8	2		190			Direction E S E-N N W.
				i S	5	8	22					
				M	5	10		5.6		116.4	114.2	
				F	5	25						

No.	Date 1918.	Character.	Phase.	Time (Greenwich).	Period in seconds.	Distance of epicentrum.	Amplitude (half)		Remarks.
							A_E	A_N	
				h m s			μ	μ	
99	29 July	I	e	11 26					
			F	11 41					
100	29 »	I	e	16 57					
			M	17 7	6.0		29.7	30.9	
			F	17 55					

SEISMOLOGICAL BULLETIN.

AUGUSTUS 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.

E. Langitude 7^{h} 7^{m} 19^{s}.

WIECHERT Horizontal Pendulum. 1000 kilograms.

The symbols are according to WIECHERT.

No.	Date 1918.		Character.	Phase	Time (Greenwich) h	m	s	Period in seconds.	Distance of epi-centrum.	Amplitude (half) A_E	A_N	Remarks.
										μ	μ	
101	1	Aug.	I	e	6	1						
				F	6	8						
102	5	»	I	e	1	49						
				F	2	58						
103	8	»	I	e	9	57						
				M	10	8		6.0		12.8	16.5	
				F	10	38						
104	11	»	I	e	25	53						
	12	»		F	0	8						Malabar i P — S = 37 sec. △ 330
105	12	»	II_a	i P	4	58	49		240			Felt at Batavia, Bantam and S-E Sumatra
				i S	4	59	16					
				M	5	0	18	5.0		336.—	362.—	
				F	5	21						
106	15	»	III_r	P	12	22	53		1020			At 12^{hr} 26^{m} the E-W boom gets out of order.
				S	12	24	45					
				M	12	27		5.5		>389.—	>383.—	End masked by No. 107.
107	15	»	II_r	i P	13	5	29		2440			Felt in res. of Menado, N. Celebes.
				i S	13	9	29					
				M	13	9	49	6.0		?	314.5	
				e L	13	15						
				ML_1	13	21		12.0		?	73.6	End masked by No. 108.
				ML_2	13	12		24.0				
108	15	»	I	e P	15	31						
				M	15	35		6.3		?	34.6	
				F	16	16						
109	15	»	II_r	i P	17	35	7		2440			
				S	17	39	7					
				M	17	42		6.3		?	383.—	
				F	18	21						
110	15	»	I	e	18	26						
				M	18	33		5.0		?	5.1	
				F	18	46						
111	15	»	I	e	20	11						
				F	20	27						

No.	Date 1918.		Character	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
112	15	Aug.	I	e	20	37						
				M	20	43		5.8		?	10.6	
				F	20	58						
113	16	»	I	eP	3	30	25					E-W boom restored at $1^h\ 30^m$
				M	3	37		6.4		70.8	67.2	
				F	4	10						
114	16	»	I	e	4	51						
				F	5	5						
115	16	»	I	e	7	26						
				M	7	32		6.0		19.1	11.6	
				F	8	1						
116	16	»	I	P	8	40	33					
				M	8	45		5.1		21.9	25.5	
				F	9	23						
117	16	»	I	i	9	30						
				M	9	35		5.1		19.4	14.9	
				F	10	16						
118	16	»	I	i	10	41	1					
				M	10	46		6.3		21.4	26.8	
				F	11	26						
119	16	»	I	e	16	58						
				M	17	3		6.0		13.6	19.6	
				F	17	28						
120	18	»	I	e	3	55						
				M	4	3		6.0		8.4	7.6	
				F	4	11						
121	18	»	I	e	6	9						
				M	6	15		6.0		24.6	29.5	
				F	6	43						
122	19	»	I	e	17	32						
				M	17	39		5.0		32.5	29.8	
				F	17	51						
123	20	»	I	e	0	3						
				M	0	8		5.8		18.8	14.1	
				F	0	23						
124	20	»	I	e	13	1						
				F	13	12						
125	21	»	I	e	0	23						
				F	0	36						
126	21	»	I,	iP	20	51	24		175			Malabar: iP — iS = 17 sec. △ = 150
				iS	20	51	44					
				M	20	51	51	4.0		94.8	102.9	Direction SW — NE.
				F	21	5						Felt in Bantam and Preanger.

No.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
127	25	Aug.	I	e	7	46	30					
				M	7	51		6.0		14.5	16.5	
				F	7	48						
128	25	»	I	e	0	33						
				M	0	38		5.5		13.6	12.5	
				F	1	8						
129	27	»	I	e	20	7						
				F	20	14						
130	31	»	I	e	1	46						
				F	1	56						
131	31	»	II,	iP	21	54	58		590			Direction SE — NW.
				iS	21	56	3					Felt in Soerakarta, Banjoemas, Kedoe, Madioen, Pasoeroean.
				M	21	57	38	5.0		335.6	319.2	Malabar iP — iS = 37,5 sec. △ = 340
				F	22	29						

SEISMOLOGICAL BULLETIN.

SEPTEMBER 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.

Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.

E. Longitude 7h 7m 19s.

WIECHERT Horizontal Pendulum. 1000 kilograms.

The symbols are according to WIECHERT.

N°.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
132	1	Sept.	I	e	20	6						
				F	20	16						
133	2	»	I_v	P	14	22	41		820			
				S	14	23	9					
				M	14	30		6.0		6.2	5.8	
				F	14	58						
134	3	»	I	e	15	12						
				F	15	25						
135	4	»	I_v	P	3	13	6		540			Malabar: i P — i S = 29 sec.
				S	3	14	6					△ = 280
				M	3	15		5.5		95.2	106.4	Felt in res. Banjoemas Centr. Java.
				F	3	34						
136	4	»	I	e	17	22						
				F	17	36						
137	5	»	I	eP	7	10	28					
				M	7	15		6.2		60.6	85.8	
				F	7	43						
138	7	»	I	e	7	19						
				M	7	24		5.8				
				F	7	32						
139	7	»	II_u	P	17	27	0		6370			
				PR_1	17	29	48					
				PR_2	17	31	26					
				S	17	34	56					
				M	17	38		5.4		92.5	114.6	
				eL	17	43						
				ML_1	17	58		23.6		582.0	422.6	
				ML_2	18	22		16.0		535.3	286.4	
				ML_3	21	1		18.0		25.1	21.4	
				ML_4	21	28		16.0		9.0	13.8	
				F	21	48						
140	8	»	I	e	22	51	46					
				M	22	56		5.9		20.3	34.0	
				F	23	3						

No.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
141	9	Sept.	I	e	14	26						
				M	14	31		6.0		7.3	7.1	
				F	14	41						
142	11	»	II$_r$	i P	4	11	19		2555			Direction S W-N E.
				i S	4	15	25					
				M	4	16		5.8		72.1	172.0	
				F	4	48						
143	13	»	I	e	7	1						
				F	7	18						
144	13	»	I	..	7	56						
				F	8	13						
145	14	»	I	e	17	5						
				M	17	26		6.0		6.2	10.7	
				F	17	36						
146	17	»	I$_v$	P	19	29	1		140			Malabar: i P — i S = 11 sec. △ = 100
				S	19	29	27					Felt at Pitjoeng-Poeger, Preanger, Java.
				M	19	30						
				F	19	33						
147	19	»	I	P	2	16	53					Malabar: P — S = 31 sec.
				M	2	19		5.0		71 0	36.2	△ = 280.
				F	2	33						Direction N W-S E.
												Felt in East Java, Madoera and Bali.
148	19	»	I$_v$	P	19	53	26		440			Malabar: P — S = 31 sec.
				S	19	54	15					△ = 280
				M	19	56		5.1		108.4	81.3	
				F	20	22						
149	21	»	I$_v$	P	13	52	53					Felt at Palembang and Benkoelen, S. Sumatra.
				M	13	56		4.0		13.2	15.7	
				F	13	42						
150	22	»	II$_r$	i P	9	57	7		1280			Direction S W-N E.
				S?	9	59	25					Felt at Padang, Sumatra; small destructions.
				M	10	1		6.0		272.7	223.1	
				F	10	35						
151	29	»	I	e	12	19						
				M	12	32		6.0		11.	17.0	
				eL	12	33						
				ML	12	38		16.0				
				F	13	16						
152	30	»	I$_v$	i P	9	24	52		180			Malabar: i P — i S = 18 sec.
				i S	9	25	12					△ = 160
				M	9	25	20	3.6		62.8	54.4	Felt at Tjianten, res. Batavia.
				F	9	33						
153	30	»	I	e	13	57						
				F	14	4						
154	30	Sept	I$_v$	P	14	7	55		340			
				S	14	8	34					
				M	14	10		4.0		13.5	15.3	
				F	14	21						
155	30	»	I$_u$	P	18	2	17		7080?			
				S?	18	10	50					
				M	18	12		6.0		20.6	21.0	
				eL	18	26						
				ML	18	28		18.0		44.0	49.9	
156	30	»	I$_u$	e	18	46	10		6560?			
				S?	18	54	16					
				F	19	18						

SEISMOLOGICAL BULLETIN.

OCTOBER 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Langitude 7^h 7^m 19^s.
WIECHERT Horizontal Pendulum. 1000 kilograms.
The symbols are according to WIECHERT.

N°.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E	A_N	Remarks.
										μ	μ	
157	1	Oct.	I_v	P	0	58	56		165			
				S	0	59	9					
				M	1	1		5.5		47.3	48.5	
				F	1	15						
158	1	»	I_v	P	12	54	10		165			
				S	12	54	28					
				M	12	56		5.1		39.2	34.5	
				F	13	6						
159	2	»	I	e	0	25						
				M	0	35		5.4		14.8	13.2	
				F	0	48						
160	2	»	I	e	13	28						
				M	13	35		5.9		7.3	7.4	
				F	13	48						
161	5	»	I_v	P	10	25	51		250			
				S	10	26	19					
				M	10	28		4.0		16.9	19.6	
				F	10	40						
162	9	»	II_r	iP	9	20	50		1470?			Malabar iP — iS = 126 sec.
				S?	9	23	19					△ = 1180.
				M	9	24		5.4		151·2	147·3	Felt on E-Java, Bali, Lombok, Flores, Soemba.
				F	9	53						
163	11	»	I_u	e	14	34	58		12000?			
				M	14	47		6.0		14.7	19.9	
				eL	15	16						
				ML_1	15	32		40.0		149.5	149.3	
				ML_2	15	48		22.0		113·4	117·3	
				F	16	28						
164	13	»	I	e	12	50						
				F	13	8						
165	14	»	I_u	e	12	12			8000?			
				M	12	22		6.0		23.9	14.2	
				eL	12	40						
				ML	12	43		26.0				
				F	12	58						

No.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
166	14	Oct.	I_v	P	19	41	16		150			Malabar: iP—iS = 11 sec.
				S	19	41	33					△ = 95
				M	19	42						
				F	19	45						
167	15	»	I_v	eP	1	28	16		230			Malabar: iP—iS = 12 sec.
				S	1	28	44					△ = 110
				M	1	30		5.0		14.8	10.5	
				F	1	39						
168	16	»	I	P	19	33						Malabar iP—iS = 177 sec.
				M	19	39		5.3		61.8	36.2	△ = 1710
				F	20	18						Felt at Wal Werang, Solor-Isles.
169	22	»	I_r	P	8	12	40		2470			Felt at Tobelo, Halmaheira.
				S	8	16	43					
				M	8	18		6.0		18.4	13.2	
				F	8	35						
170	25	»	I_r	eP	19	8	32		2380			
				S	19	12	27					
				M	19	15		6.0		33.0	22.5	
				F	19	38						
171	26	»	I	e	17	3						
				M	17	8		6.0		9.2	10.6	
				F	17	18						
172	27	»	I_u	eP	15	36	41		5890			
				S	15	44	11					
				M	15	45		5.6		38.3	25.9	
				eL	15	56						
				F	16	23						
173	27	»	I	P	17	14	37					
				M	17	24		6.0		58.7	77.6	
				F	18	48						

SEISMOLOGICAL BULLETIN.

NOVEMBER 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Langitude 7^h 7^m 19ˢ.
WIECHERT Horizontal Pendulum, 1000 kilograms.
The symbols are according to WIECHERT.

No.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
174	2	Nov.	I_v	eP	0	23	26		135?			Very small record, hence P uncertain.
				S=M	0	23	41					
				F	0	26						
175	3	»	I_u	P	11	24	31		7200?			
				S?	11	33	7					
				M	11	35		5.7		7.1	10.3	
				eL	11	48						
				ML	11	51		14.0		19.7	16.5	
				F	12	13						
176	3	»	I	e	12	51						Felt at Banggaai-Archipelago, Celebes, and Ceram.
				F	13	5						
177	5	»	I_v	P	16	26	29		160			
				iS=M	16	26	49	2.0		26.3	17.5	
178	6	»	I	e	22	9	23					
				M	22	14		6.5		4.2	7.5	
				F	22	22						
179	8	»	II_u	P	4	48	44		7450			Malabar very small record.
				S	4	57	36					
				M	4	59		5.8		68.3	122.9	
				eL	5	7						
				ML	5	28		17 0		114.0	110.4	
				F	6	46						
180	8	»	I	e	5	12	24					Covered by No. 179.
				M	5	19		5 0		27.9	15.1	
				F	5	22						
181	8	»	I_v	iP	7	37	45		180			Malabar iP — iS = 15,6 sec.
				iS	7	38	5					△ = 140
				M	7	40	49	4.4		85.2	105·1	Felt at Lebak Parai, Bantam.
				F	7	50						
182	18	»	III_r	iP	18	46	40		2440			Animuth E 13° S.
				iS	18	50	39					Malabar: iP – S = 215 sec.
				M	18	52		6.0		>369.6	>374.9	△ = 2100
				ML	19	28		18.0		138.7	149.7	Felt at Timor, Neira, Aroe-Isles and Merauke.
				F	21	10						

No.	Date 1918.	Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
183	19 Nov.	I_v	i P	1	2	5		150			Malabar i P — S = 14,3 sec.
			i S	1	2	22					△ = 125
			M	1	3	2	2.0		12.1	14.6	
			F	1	9						
184	19 »	I_v	P	4	5	13		160			Malabar very small.
			S	4	5	31					
			M	4	6	28	4.8		5.3	8.4	
			F	4	11						
185	19 »	I	e	5	27						
			M	5	31		5.6		8.8	12.9	Malabar small.
			F	5	47						
186	19 »	I_v	e P	20	42	5		490			Malabar small.
			S	20	42	57					
			M	20	43		4.0		8.2	10.5	
			F	20	51						
187	21 »	I	e	1	39						
			M	1	45		5.8		7.9	9.2	
			F	1	56						
188	22 »	I_v	P	22	21	43		2300?			Malabar very small.
			S?	22	25	34					
			M	22	27	3	4.8		8.1	12.2	Felt at Ternate.
			F	22	40						
189	23 »	I	e	0	39						
			M	0	44		6.5		5.0	5.6	
			F	1	3						
190	23 »	II	i P	23	3	41					Azimuth E 11° 20′ S.
			M	23	9		5.9		107.3	108.1	Malabar i P — i S = 226 sec.
	24		F	0	10						△ = 2270
191	24 »	I	e	17	28						Felt at Neira, Ceram, Aroe-Isles and Merauke.
			M	17	34		5.8		5.0	4.4	
			F	17	42						
192	27 »	I	e	19	59						
			F	20	6						
193	28 »	I	e	2	24						
			F	2	34						
194	28 »	I	e	5	33						
			M	5	44		6.0		5.4	4.9	
			F	5	48						
195	28 »	I_v	e P	20	17	34		630?			Malabar very small.
			S?	20	18	43					
			M	20	21		4.4		13.1	14.9	
			F	20	42						
196	30 »	I	e	7	32						
			F	7	48						
197	30 »	I	e	11	40						
			F	11	51						

SEISMOLOGICAL BULLETIN.

DECEMBER 1918.

BATAVIA OBSERVATORY, JAVA.

Foundation: River Quartair.
Mean Greenwich time. S. Latitude 6° 11′ 0″. Height above sealevel 8 m.
E. Langitude 7h 7m 19s.
WIECHERT Horizontal Pendulum, 1000 kilograms.
The symbols are according to WIECHERT.

No.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
198	1	Dec.	I	e	2	44						
				M	2	57		6.4		9 4	7.9	
				F	3	34						
199	2	»	I	e	10	7	47					
				M	10	9		4.1		9.3	8.2	
				eL	11	3						
				ML_1	11	5		22.8		66.8	29 2	
				ML_2	11	10		20.0		57.9	44.4	
				ML_3	11	17		18.2		48 9	25.9	
				F	11	33						
200	3	»	I	e	17	52						
				M	17	56		5.6		5.3	7.2	
				F	18	21						
201	4	»	II$_v$	eP	12	7	46		600?			Malabar eP — iS? = 29 sec.
				iS?	12	8	51					△ = 260
				M	12	8		6.1		66.3	77.2	
				F								Covered by No. 202.
202	4	»	I	eL	12	36						Beginning covered by No.
				ML_1	12	53		26.0		191·3	75.9	201.
				ML_2	13	8		19.5		102·1	326.8	Malabar eL = 13h 10m.
				ML_3	13	37		15.6		68.7	44.2	End covered by 203.
				F	14	14						
203	4	»	I	e	14	12						Beginning covered by 202.
				M	14	17		6.4		5.6	5.7	
				F	14	53						
204	4	»	II$_v$	eP	21	3	3		380			Malabar eP — iS = 37 sec.
				iS	21	3	45					△ = 330
				M	21	6		5.9		193·2	171.7	
				F	21	22						
205	6	»	I	e	7	42						
				M	7	44		5.5		2.8	5.1	
				F	7	52						
206	7	»	I$_v$	eP	23	38	50		150			Malabar e — iS = 12.4
				iS=M	23	39	7					△ = 115
				F	23	45						

No.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
207	8	Dec.	I,	e P	23	38	48		170			Malabar e P — i S = 11 sec.
				i S=M	23	39	7					△ = 100
				F	23	44						Felt at Pitjoeng-Poeger, Preanger, Java.
208	9	»	I	e	19	6						
				M	19	18						
				F	19	29						
209	11	»	II,	i P	19	35	18		230			Malabar e P — S = 27 sec.
				i S=M	19	35	43					△ = 240.
				F	19	44						
210	14	»	I	e	18	49	2					
				M	18	59		5.1		24.0	14.3	
				F	19	32						
211	16	»	I	e	3	12						
				M	3	19		6.6		6.2	5.7	
				F	3	37						
212	18	»	I	e	21	34						
				M	21	41		6.3		8.9	13.1	
				F	21	53						
213	21	»	I	e	4	43						
				F	4	52						
214	21	»	I	e	15	55	50		210			
				i S=M	15	56	14					
				F	16	1						
215	21	»	I	e	17	31						
				i S=M	17	31	55					
				F	17	35						
216	21	»	I	e	20	34						
				F	20	40						
217	23	»	I	e	3	16	32					
				M	3	20	48	5.8		—	5.4	
				F	3	29						
218	23	»	I	e	9	57						
				F	10	16						
219	24	»	I	e	21	40						
				M	21	43						
				F	21	55						
220	25	»	I	e	1	14	47					
				M	1	23	20	5.8		4.3	3.9	
				F	1	34						
221	25	»	I,	P	10	29	7		380			Malabar P — S = 11 sec.
				S?	10	29	49					△ = 100.
				M	10	31	50	5.3		22.0	15.9	
				F								F Covered by No. 222.

No.	Date 1918.		Character.	Phase.	Time (Greenwich). h	m	s	Period in seconds.	Distance of epicentrum.	Amplitude (half) A_E μ	A_N μ	Remarks.
222	25	Dec.	I	M	10	40		2.7		29 3	28.5	P covered by No. 221.
				F	10	57						
223	28	»	I	e	8	8						
				M	8	13		6.2		12.5	9.4	
				F	8	22						
224	30	»	I	e	7	21						
				F	7	32						