

No. 31.

1934.

Geodætisk Institut
 Proviantgaarden, Copenhagen, Denmark.

Bulletin
 of the seismological station

KØBENHAVN

$\varphi = 55^{\circ}41' N.$ $\lambda = 12^{\circ}27' E.$ $h = 13$ m.

Lithologic foundation: chalk.

No. 31. July—Sept. 1934.

Instruments:

Galitzin pendulums with galvanometric registration.

Constants:

Component	l	T_1	A_1		μ^2	T	k
	cm	sec	cm			sec	
N	12.5	12.61	100		- 0.1	12.1	103
E	12.5	12.65	100		0.1	12.3	101
Z	14.5	10.02	100	$\frac{1}{7} - \frac{10}{8}$	0.3	11	100
				$\frac{10}{8} - \frac{80}{9}$	0.0	11	100

Wiechert 1000 kg. horizontal seismograph.

Wiechert 1300 kg. vertical seismograph.

Constants:

Component	T	ν	ρ	V
	sec		mm	
N	9.8	4.5	0.6	215
E	9.8	4.5	0.8	195
Z	5.8	4.5	0.1	160

Milne-Shaw seismograph, E component, with the approximate constants $T = 12^s$ $\nu = 20$ $V = 300$.

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No.	Date	Hour	Forerunners				L	Un- defined	△	Remarks
			P	S						
	1934 July		<i>m s</i>	<i>m s</i>	<i>h m s</i>	<i>m s</i>	<i>h m</i>	<i>h m</i>	°	
1	1	20					.9			
2	3	4					.5			Phases in forerunners not clearly [marked.]
3	4	2			4		.6			
4	6	19					.4			
5	6	23	0 51	10 40	10 45	15.6	.4		77	California.
6	8	14					.7			
7	10	1	14.0	23 40			.6		76	
8	10	21			34.6		1.4			
9	12	1					.9			Seismic? Pacific Ocean. <i>P</i> uncertain owing to microseismic disturbance.
10	12	10		13 30	6 39		.5			
11	12	13			20			22		
12	12	14			43.0		1.4			
13	13	11					.3			Faint.
14	14	5			48.4			51		
15	15	8					.6			
16	16	8			35 22	42.5	1.0			
17	16	18			6.1					
18*	18*	1	<i>i</i> 49 7	59 41	52.5	65.4				Panama. Aftershock.
19	18	4	13 22	23.9						
20	18	6	48 15							
21	18	11			57.8			1.1		
22	18	13			26 16					
23	18	13			56			1.1		
24	18	16	22 34		33 12			.8		
25*	18*	17	<i>i</i> 12 24	23 2	15.9	28.7				Panama. New Hebrides region. Salomon Islands region. New Guinea region.
26*	18*	19	56.5		59 53	61 56				
27*	19*	0			26 4	28 26				
28	19	1			45.0	46.3	1.3			
29	19	6			4.6	7.1				<i>e</i> 8 ^m 0.
30	19	7			56 12	58 44				<i>e</i> 59 ^m 43 ^s ; 60 ^m 11 ^s .
31	19	12			22.1			1.3		
32	19	15						.6		
33	19	23			20					
34	20	2	22 15	32.0				.8		76 Aleutian Islands region.
35	20	4			12					
36	20	13			40.0			1.3		
37	20	17			7 36	10 0				<i>e</i> 11 ^m 5 ^s .
38	20	18			31.9	33.0				
39	20	19			8.1	11.4				
40	21	5						20		
41*	21*	6			37 30	40.3				New Hebrides region.
42*	21*	10	<i>i</i> 51 50		55 12	68.4				Panama.
43	21	13			32	42.7				
44	21	18			56			1.8		
45	21	20			33			1.3		
46	22	3			17 5	19 28	1.0			<i>e</i> 20 ^m 34 ^s .
47	22	13			.6					
48	22	14						.8		

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			P	S						
			<i>m s</i>	<i>m s</i>	<i>h m s</i>	<i>m s</i>	<i>h m</i>	<i>h m</i>	°	
49	1934 July 22	19					.4			
50*	22*	20	<i>i</i> 4 39	10 52					41	
51	23	18	31 45	40 3	41.7		49		61	
52	24	3			10.8		.6			
53	24	15					.5			
54	25	1						56		
55	25	12					.0			
56	25	15					1.7			
57	27	2			48 49	49 25	1.1			
58	27	13					.7			
59	28	2	14.6	21 16	16.4		.5		45	
60	28	16					20			
61	28	18					.5			
62*	28*	21	48 2	57 8	50 41		1.1		69	
63	30	2					28			
64	30	3					17			
65	30	3			58		1.7			
66	31	6	11 23	21.8			.7		84	
67	31	11	11.5	21.6	22.0					
68	31	12	1 47	12 2			.5			
69	31	15						33		
70	Aug. 1	12					.4			
71	1	23					52			
72	2	7	23 30	31 55	33 19		.7		62	
73	3	10					15			
74	3	19			53.1		1.2			
75	4	13			27 56		1.0			
76	6	12	19 59		30 27	30 40	.9			
77	6	16					.8			
78	6	17						25		
79*	7*	3			59 22	61 50	1.7			
80	7	11	58 39	65 34	60.5	69.0	1.2		48	
81	8	22					.6			
82	9	6					.6			
83	9	14					.4			
84	9	19					1.6			
85	10	3					.9			
86	10	23					27			
87	11	8		40 42			1.0			
88	11	12			23 29	27.9	1.0			
89	11	15					.6			
90	12	14			21					
91*	13*	0	2 52		6 49	13 42				
92	13	11			5.5		.8			
93	14	9			11.8	12.4	.9			
94	15	5						14		
95	15	11	16 54		27 21	28.7	.8			

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			P		S					
			<i>m s</i>	<i>m s</i>	<i>h m s</i>	<i>m s</i>	<i>h m</i>	<i>h m</i>	°	
96	1934 Aug. 16	14			54	64				
97	18	3			0.5		.3			
98	19	23					45			
99	21	19	39 15	49 45	50.5		1.2		85	Sumatra.
100	22	7						23		
101	22	8					.1			
102	22	8					.6			
103	22	11					.1			
104	22	19					.6			
105	23	23					.3			
106	23	23			49.7	53.1				<i>e_Z</i> 52 ^m .3.
107	24	0			8 2°	11 33				<i>e_Z</i> 10 ^m .6.
108	24	9					.7			
109	25	5					52			
110	25	19					49			
111	26	1			55 2°		74			
112	26	10					.0			Preceding movement disturbed.
113	28	12					.2			Faint.
114	29	4					.3			*
115	30	22					.7			
116	31	1					.0			
117*	31*	5	9 50	15 27	11 6	18.0			35	Baffin Bay.
118	31	15	5 38	11 51	7 18	14.5			41	Afghanistan. <i>PP</i> much larger than <i>P</i> . [<i>e_P</i> 12 ^m 24 ^s .
119	31	18					.1			
120	Sept. 1	7			15 11	20 28	1.0			<i>e</i> 42 ^m .0.
121	1	9					.4			Disturbed.
122	1	11			49.6		1.1		52	Beginning quite small, uncertain.
123	1	12								
124	2	10					.0			
125	2	12					.1			
126	3	3					.2			
127	3	10					.7			
128	4	1			30 41		32			Eastern Alps.
129	4	16			54 7	57.9	1.7			Loyalty Islands region. No <i>G, Z</i> record.
130	5	2			37.3		.8			
131	5	10					.7			
132	6	0							57	Faint.
133	6	2			30.0	34.1				40 ^m 28 ^s . Mindanao.
134	6	19					.6			
135	7	3	44 6	47.9			50		21	Algeria.
136	7	20			33.3		35			
137	7	23			33.6		37			
138	8	6			54.6	62.5	1.1			Tien Shan Mts.
139	8	11			34		1.5			
140	8	20					21			
141	9	5					.4			
142	11	1			24.2		30			

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			P	S						
	1934 Sept.		<i>m s</i>	<i>m s</i>	<i>h m s</i>	<i>m s</i>	<i>h m</i>	<i>h m</i>	°	
143	11	7					3			
144	11	9					.3			Disturbed.
145	11	14					30			
146	12	14			.9		67			
147	12	16					.3			
148	12	18					.4			
149	13	3					.8			
150	13	11					.0			Faint.
151	13	15					.0			
152	13	23					.7			Faint.
153	14	4					.9			
154	14	10					.1			
155	14	15					.9			
156	15	0			19.2		1.1			
157	15	7	9.8		13.1	20.1	.6			Mexico. <i>P</i> quite small, somewhat [uncertain.
158	15	13					.9			
159	16	13					58			Some preceding movement.
160	16	19					.9			
161	17	14					.4			
162	17	19					16			
163	18	7						31		
164	18	19					9			
165	20	20					.1			
166*	21°	12	i51 33		i52 5	61 50				Sumatra. Faint.
167	21	18						40		
168	22	7						54		
169	22	12					.4			
170	23	1					.8			
171	23	8			18.8		1.3			Disturbed by change of sheets.
172	23	22					.4			
173	24	10			49 23					
174	25	19			34.5	36.3	1.2			Readings uncertain owing to irregu- [lar microseismic disturbance.
175	25	23					.9			
176	26	1			15		.4			
177	26	7	37 53	46 26	47 28		56		64	Atlantic Ocean.
178	27	23					.2			

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NOTES

- No. 18. July 18. 1^h. Panama, $\Delta = \text{ca. } 85^\circ$. Focus below normal. iP_Z , condensation, followed by large oscillations; e_N 50^m.2. PP 52^m.5; PPP_Z 54^m.4. Some increase of movement on E 58^m.8. e_N 59^m.3. S 59^m.41^s, clearly marked on E , followed by large oscillations; e_N 59^m.51^s. On E , a second groupe of large oscillations, maximum 61^m.0, no definite beginning. SS 65^m.4, large. L not very large; regular, of long duration.
- No. 25. July 18. 17^h. Panama, $\Delta = \text{ca. } 85^\circ$. Focus below normal. iP 12^m.24^s, condensation; 12^m.34^s, larger. PP 15^m.9. S 23^m.2^s, large on E ; e_E 23^m.22^s, larger. e_N 23^m.7. e_E 24^m.2, large; e_E 25^m.7. SS 28^m.7. L not very large; regular, of long duration.
- No. 26. July 18. 19^h. New Hebrides region; $\Delta = \text{ca. } 135^\circ$. Strong record. P small, on Z only, somewhat uncertain, being superposed on L of preceding shock. P' 59^m.53^s, on Z clearly marked and followed by several rather large oscillations; small on N and E . PP 61^m.56^s large, increase of movement 62^m.5. $P_e P_e S$ 63^m.2^s, large; 63^m.4 very large oscillations; e 64^m.3. (PPS) 74^m.9 large. SS 80^m.0; e_E 81^m.0. SSS 85^m.0. The beginning of L uncertain, about 20^h.6. M rather large, regular. L of long duration.
- No. 27. July 19. 0^h. Salomon Islands region, $\Delta = \text{ca. } 135^\circ$. P' 26^m.4^s clearly marked on Z , quite small on N and E . PP 28^m.26^s. $P_e P_e S$ 29^m.32^s, rather large oscillations on N and E . Later phases not clearly marked.
- No. 41. July 21. 6^h. New Hebrides region, $\Delta = \text{ca. } 135^\circ$. P'_Z 37^m.30^s preceded by quite small movement. PP 40^m.3, large on Z ; $P_e P_e S$ 41^m.4, large on N and E . e 42^m.6; 46^m.0; 52^m.0; 53^m.2. SS 57^m.6, increase of movement 58^m.0. Oscillations of very long period in first part of L .
- No. 42. July 21. 10^h. Panama, $\Delta = \text{ca. } 85^\circ$. iP , condensation. PP 55^m.12^s. $e(S)$ 62^m.4, e_E 62^m.36^s, large. e 63^m.5, large. SS 68^m.4.
- No. 50. July 22. 20^h. Afghanistan. Deep focus. Azimuth of epicentre nearly E . Several clearly marked phases on E and Z . iP 4^m.39^s, condensation, small. i 5^m.35^s, small; 6^m.0^s, in time mark, larger. 6^m.5 oscillations of longer period. $e_{E,Z}$ 7^m.33^s; large oscillations begin about 7^m.42^s; e_N 7^m.54^s. iS 10^m.52^s, large on E ; $e_{N,E}$ 12^m.3; e 14^m.2, large. L small.
- No. 62. July 28. 21^h. Alaska. P , condensation; first movement 48^m.2^s quite small, iP 48^m.4^s, large oscillations; e 48^m.3. PP 50^m.41^s; PPP 52^m.6. S 57^m.8^s; PS 57^m.23^s, larger. $e(S_e S)$ 58^m.2.
- No. 79. August 7. 3^h. Pacific Ocean, $\Delta = \text{ca. } 135^\circ$. P' 59^m.22^s, clearly marked on Z . PP 61^m.50^s. $P_e P_e S$ 62^m.54^s, large on N and E . (PPS) 74^m.8. SS 79^m.9, not very prominent; SSS 84^m.5, well-marked on N .
- No. 91. August 13. 0^h. Mindanao, $\Delta = \text{ca. } 95^\circ$. P_Z 2^m.52^s, small. Later phases most clearly marked on E . PP 6^m.49^s. PPP 8^m.9. $S_e P_e S$ 13^m.42^s. PS 15^m.45^s. SS about 20^m, not well marked.
- No. 117. August 31. 5^h. Baffin Bay. P 9^m.50^s, dilatation; possibly a faint beginning 1 or 2 secs. earlier. PP 11^m.6^s, e_Z 12^m.28^s. S 15^m.27^s, large and clearly marked on N . e_E 15^m.9. SS_E 18^m.0. L shortly afterwards.
- No. 166. Sept. 21. 12^h. Felt on North Sumatra. $\Delta = \text{ca. } 85^\circ$. Focus rather deep. iP , dilatation. i_E ($S_e P_e S$) 61^m.50^s; e_N (S_N) 62^m.2^s (in time-mark); e_N 62^m.40^s. L small.