

No. 34.

1935.

## 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. 34. April—June 1935.

**Instruments:**

Galitzin pendulums with galvanometric registration.

**Constants:**

Component	$l$	$A_1$	$T_1$	$\mu^2$	$T$	$k$
	cm	cm	sec		sec	
<i>N</i>	12.5	100	12.61	-0.12	12.4	103.
<i>E</i>	12.5	100	12.65	-0.04	12.5	103
<i>Z</i>	14.5	100	10.02		$10^{1/2}$	103

Wiechert 1000 kg. horizontal seismograph.

Wiechert 1300 kg. vertical seismograph.

**Constants:**

Component	$T$	$\nu$	$\rho$	$V$
	sec		mm	
<i>N</i>	9.6	4.1	0.7	220
<i>E</i>	9.6	4.0	0.7	195
<i>Z</i>	5.3	4.2	0.2	170

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

Wood-Anderson torsion seismometer, *E* component,  $T = 2^s.7$ .

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No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks
			P	S						
			m s	m s	h m s	m s	h m	h m	°	
1	1935 April 1	3					.9			
2	2	17					.7			
3	3	7			11.6		.6			
4	3	11	i 19 42	25 53	20 52	29.2			41	
5	3	12					.4			
6	3	22					.3			
7	4	18			12.2		.6			
8	5	15						3		
9	7	10					.7			
10	9	20	5 19	9 47	10 15					
11	9	23					.9			
12	11	1			39.5		1.0			
13*	11*	23	21 29	26 52					33	
14	12	0	18 9	23 30					33	
15	12	1	13 26	18 47					33	
16	12	12	51 15	56 42						
17	12	20					15			
18	12	22	38 40	44 7						
19	13	2	36.0	41 26						
20	14	6						.1		
21	15	11			35.9	37.8	.9			
22	15	22					.0			
23	15	23					.4			
24	18	22			28.6		.6			
25	19	4					.9			
26	19	8					.8			
27*	19*	15	i 28 41	33 2*	i 28 51					
28	19	16	i 23 58							
29	19	18	3 3*	7 24	7 34		9		25	
30	19	20	i 36 57	41 15	41 24		43		24	
31	19	23					.7			
32	20	5	16 15	20 37	20 47				25	
33	20	10					.0			
34	20	11					.9			
35	20	21					.1			
36	20	22	14 7	24 13	25.2	28.9	.6		80	
37	21	7			50.5	51 24	1.2			
38	21	19						57		
39	22	5					.8			
40	22	13			29.3		.6			
41	23	16	i 56 20	i 65 0	59.1	65.8	1.3		65	
42	24	16	4 2*	13.6			.5		75	
43	24	19	4 23	14 59	14 44		.6			
44	27	19			15.7			20		
45	29	19			37.1		40			

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No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks
			P	S						
	1935 May		<i>m s</i>	<i>m s</i>	<i>m s</i>	<i>h m s</i>	<i>h m</i>	<i>h m</i>	°	
46	1	4					43			
47	1	10	30 10	34 39	31 6	34 47	37		26	Caucasia.
48	2	8					27			
49	2	10					.6			Small preceding movement.
50	2	22					.2			Faint.
51	3	5					.4			
52	4	0						.5		
53	4	2					.7			
54	4	23	14 41	24 46			.7		80	Formosa.
55	5	3					.8			
56	5	19					.1			
57	6	18					.4			
58	6	20					.4			
59	7	6			19.6		.7			Preceding movement disturbed.
60	9	5					.5			
61	10	17					.7			
62	11	19			24.1			26		
63	12	0					.6			
64	12	5			34.9	38.1	.7			
65	12	20					.8			Small preceding movement.
66	13	20	5 10	14 40	7.9	15 20	.5		74	SS 19 <sup>m</sup> .3; SSS 22 <sup>m</sup> .8. Siam.
67	14	0			2 44		1.1			
68*	14*	23			41.7	43 1*	1.2			South-Atlantic Ocean.
69	15	2	10 7	17 1*	12 2*		.5		48	Baluchistan.
70	16	17		38.5			.8			Afghanistan. Masked by microseisms.
71	16	21			25.1		.9			Some preceding movement. Masked
72	18	17			44		.9			[by microseisms.
73	18	21			54.8		1.7			
74	20	5			35	45.8	1.2			Celebes.
75	20	18			27.5		.6			
76	21	4	32 26	40.5					59	China.
77	21	7			11 43	17.6	.8			e 21 <sup>m</sup> .3; SS 28 <sup>m</sup> . Australia. Phases
78	21	12			57	84	2.0			[not clearly marked.
79	21	16					.2			
80	22	9					.0			
81	22	10					.5			
82	23	2					.9			Faint.
83	23	18	8 21	15 50			.4		53	P not clearly marked, the reading uncertain. Atlantic Ocean.
84*	24*	5	49 45		60.5	60 51				Pacific Ocean.
85	24	23					.4			
86	25	0	21 11		31.6	33.5	.9			PP 24 <sup>m</sup> .9; SS 38 <sup>m</sup> .8. Philippines.
87	25	9					.4			
88	25	22					.3			
89	26	22	17.1		27 38	28.2	.9			P uncertain, possibly earlier than
90	27	3			31.6	42.2				[read. PP 20 <sup>m</sup> .9. Philippines.
91	27	4					.5			L of preceding shock?
92	27	6					.3			
93	28	15					.1			

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No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks
			P	S						
			m s	m s	m s	h m s	h m	h m	°	
	1935 May									
94	28	17					.6			Small preceding movement.
95	29	20			5.1		.4			Formosa.
96*	30*	21	41 20	48.1	48.6		55		46	Baluchistan.
97	31	2	12 11	19.0			.5		47	»
98	31	8	29 28	38 17					66	No Z record. Sea of Japan.
99	31	13		28 43			32			Iran.
100	31	17			22.6	27.5				e 30 <sup>m</sup> .7.
	June									
101	1	4	38 37	45 25	48.9		57		47	Baluchistan.
102	1	12					.9			
103	1	14	53.2		57 14	64.3	1.5			Borneo. P quite small, uncertain.
104	2	9	i 24 52	31 39	26 40	34.9			46	Baluchistan.
105	2	10	i 2 39				.5			
106	2	15						3		Seismic?
107	2	17					.6			Faint.
108	4	19					.4			»
109	5	11					54			Italy.
110	8	23					.5			
111	9	7					.4			
112	10	7					.6			
113	11	22			19.5	19 53	.7			
114	14	21					.8			
115	16	7					.4			
116	18	17					.3			
117	18	18					.6			
118	18	22			44.8	51 29	1.3			Small movement on Z from about 41 <sup>m</sup> . e 51 <sup>m</sup> 59 <sup>s</sup> . Pacific Ocean.
119	19	22			36.2		1.3			Salomon Islands.
120	20	1					23			
121	22	16			7.0	13 26	.6			e 16 <sup>m</sup> 19 <sup>s</sup> ; 22 <sup>m</sup> . Celebes.
122	23	7					35			
123	23	16					.4			
124*	24*	23			i 42 22	44 58	1.3			New Hebrides.
125	25	12					.6			
126	25	12	45 9	54.5	49.4		69		72	Kurile Islands. S somewhat Faint. [uncertain.]
127	26	0					.6	10		
128	27	3								
129	27	17			22 3		24			Germany.
130	28	2			20.6	25.9	.9			e 30 <sup>m</sup> .3. Off Chile. No G. E and Z records.
131	28	9						14		
132	28	19			20		.6			No G. Z record. Disturbed. Japan.
133	28	21						.2		
134	29	7	i 1 48		12 27	13.7	.5			PP 5 <sup>m</sup> 17 <sup>s</sup> . SS 19 <sup>m</sup> . Pacific off Mexico.
135	29	10						.2		Small preceding movement.
136	30	0					.7			
137	30	8	17.3				.6			Iran.

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NOTES

- No. 13. April 11. 23<sup>h</sup>. Persia. *P* and *S* large; the beginning of *P* not very well defined. *L* not large, with much movement of rather short period superposed on movement of long period; the beginning not certain.
- No. 27. April 19. 15<sup>h</sup>. Mediterranean Sea. Deep focus. *iP* 28<sup>m</sup>41<sup>s</sup>, dilatation; *i* 28<sup>m</sup>51<sup>s</sup> much larger. *S* in minute break, followed by very large oscillations. *L* soon after *S*; *M* smaller than *S*.
- No. 68. May 14. 23<sup>h</sup> South-Atlantic Ocean.  $\Delta = \text{ca. } 120^\circ$ . *P'* 41<sup>m</sup>.7, small. *PP* 43<sup>m</sup>1<sup>s</sup>, clearly marked on *Z* and *N*;  $e_{N,Z}$  43<sup>m</sup>41<sup>s</sup> larger;  $e_E$  44<sup>m</sup>.2. *SKS* 48<sup>m</sup>28<sup>s</sup>, rather large on *N* and *E*;  $e_{N,E}$  49<sup>m</sup>19<sup>s</sup>. *SKKS* 49<sup>m</sup>54<sup>s</sup>.  $e_E$  50<sup>m</sup>.6, 52<sup>m</sup>.1. *PS* 52<sup>m</sup>47<sup>s</sup> large;  $e$  53<sup>m</sup>25<sup>s</sup> larger.  $e_Z$  53<sup>m</sup>.8 large. *SS* 59<sup>m</sup>.1; *SSS* 63<sup>m</sup>.6. *L* not large.
- No. 84. May 24. 5<sup>h</sup>. Pacific Ocean;  $\Delta = \text{ca. } 95^\circ$ . *P* small, but clearly marked on *Z*. *PP* 53<sup>m</sup>39<sup>s</sup>. *SKS* 60<sup>m</sup>.5. (*SKKS*) 60<sup>m</sup>51<sup>s</sup> large. *PS* 62<sup>m</sup>.2. *SS* 67<sup>m</sup>.5.
- No. 96. May 30. 21<sup>h</sup>. Baluchistan. Strong record. *iP*; first swing quite small, dilatation, immediately followed by larger movement. Strong oscillatory movement all through forerunners. *S* large, the beginning not clearly marked;  $e_E$  48<sup>m</sup>.6 very large.  $e_E$  50<sup>m</sup>.8;  $e_{N,E}$  52<sup>m</sup>.1. *L* waves of long period about 55<sup>m</sup>. Very large *M* begin on *N* about 61<sup>m</sup> and about 66<sup>m</sup> on *E*.
- No. 124. June 24. 23<sup>h</sup>. New Hebrides region;  $\Delta = \text{ca. } 140^\circ$ . Small beginning on *Z* 42<sup>m</sup>.2;  $iP'_Z$  42<sup>m</sup>22<sup>s</sup> large.  $e_Z$  42<sup>m</sup>57<sup>s</sup>. *PP* 44<sup>m</sup>58<sup>s</sup>,  $e_Z$  45<sup>m</sup>35<sup>s</sup>. *iPKS* 45<sup>m</sup>56<sup>s</sup> and *i* 46<sup>m</sup>32<sup>s</sup> large on *N* and *E*;  $e_Z$  46<sup>m</sup>55<sup>s</sup>. *PPP* 48<sup>m</sup>19<sup>s</sup>.  $e_{N,E}$  50<sup>m</sup>.3. (*SKKS*)<sub>*E*</sub> 51<sup>m</sup>40<sup>s</sup>.  $e_N$  54<sup>m</sup>22<sup>s</sup>. (*PPS*) 57<sup>m</sup>.0;  $e_N$  57<sup>m</sup>38<sup>s</sup>. *SS*<sub>*E*</sub> 62<sup>m</sup>.6,  $e_N$  62<sup>m</sup>.9.  $e_E$  64<sup>m</sup>.5;  $e_N$  65<sup>m</sup>.8;  $e_E$  66<sup>m</sup>.0. *SSS*<sub>*E*</sub> 67<sup>m</sup>38<sup>s</sup>,  $e_N$  67<sup>m</sup>.9,  $e_Z$  69<sup>m</sup>.7.