

No. 3.

1929.

## Geodætisk Institut

Proviantgaarden, Copenhagen, Denmark.

### Bulletin

of the seismological station

# SCORESBY-SUND

$\varphi = 70^{\circ}29' N.$   $\lambda = 21^{\circ}57' W.$   $h = 69$  m.

Lithologic foundation: Gneiss.

No. 3. Jan.—June 1929.

Instruments:

Galitzin pendulums with galvanometric registration.

Constants:

Component	$l$	$T_1$	$A_1$		$T$	$k$
N	cm	sec	cm		sec	
				12.0	12.4	100
E	12.0	11.9	100		$12^{1/2}$	90
				until $2/3$	10	65
				$2/3$ — $27/6$	$11^{1/2}$	70
Z	14.1	10.1	100	from $27/6$	12	85

The values of  $T$  and  $k$  are approximate mean-values; the damping has been nearly aperiodic.

$Z$  has not been very stable; the period has varied from about  $2^s$  to  $6^s$ .

Time-corrections have been determined daily by means of Nauen scientific time-signals and time is, in general, known to the second.

Scoresby-Sund.

No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks	
			P		S						
			m	s	m	s	h	m	h	m	°
	1929 Jan.										
1	4	17				55	55				
2	6	0				5	10				
3	8	8							29		
4	8	9							33		
5*	13*	0	i 13	3	i 21	4	15.5	i 25	0		58
6	13	16						36			
7	13	19						24			
8	14	3							.1		
9	14	18						.4			
10*	16*	8				22.3	29.5	.8			
11*	17*	11	56.6		64	11					55
12	19	3							57		
13	20	15				.3					
14	21	6						.2			
15	21	10	40.2		i 48	12	44.9				58
16	22	15							.4		
17*	24*	20	47	58	56.9		50.8	62.4			67
18	25	2						.1			
19	26	3						.1			
20	26	15						.0			
21	28	22						.7			
22	30	17				21.7		.8			
23	31	18				.5		.7			
	Febr.										
24*	1*	17	i 23	52	31	32					
25*	2*	0	11.9		21	9	21	37	.5		70
26	3	3						.5			
27	3	18						.7			
28	4	7							.2		
29	4	11						.0			
30	5	4						.3			
31	6	7				7	24				
32	8	2				31		.7			
33	10	4						.3			
34*	10*	15	50.6		59.6		53.4	60.0			
35	10	17						.7			
36	13	22						.9			
37	15	8						.6			
38	17	21							.4		
39*	22*	20	52	6	60	22	61	37	61	58	60
40*	26*	9	i 9	59	17.4			.4			53
41	27	20							1		
	March										
42	1	7			47.0		42.6	50.5	55		
43	1	9					12.2		20		
44	1	16						.3			
45	1	19						.5			
46	1	21						.6			

Scoresby-Sund.

No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks		
			P		S						h m s	
			m	s	m	s	h	m	h	m	°	
	1929											
	March											
47	3	3							.4			
48	3	9										
49	3	16							59			
50	3	18							.7			
51	5	16							.6			
52*	7*	1	i 44	25	52	17					57	Aleutian Islands. Bonin Islands region. New Zealand region.
53	9	2	24.4				34.7		35.0	.9		
54*	9*	11					10.4		15.2	.9		
55	10	0							.9			
56*	10*	14					51	53	57	40		Marianne Islands.
57	10	23					4			.3		
58	11	13							.9			
59	12	3							.0			
60	13	11									19	
61	14	23							.0			
62	15	13							.9			
63	15	18					11.6			15		
64	16	6							.9			Faint.
65	18	2									12	
66	18	23					41.6		1.0			
67	19	10							.0			
68*	19*	21	5	4					.9			Central America.
69	20	21					39.6		.9			
70*	21*	2	48	20	58	1	62				74	Central America.
71	23	20					34		.9			
72	26	5									30	
73	27	22								27		
74	28	3							.8			
75	28	20					.7		1.2			
76	30	16							.9			
77	31	3							.8			
78	31	6							.3			Faint preceding movement.
79	31	20			38	8			.9			
	April											
80	2	4							.1			
81	5	9							.2			
82	6	0							.0			
83	6	1								56		
84	6	4					15.6			21		
85	6	5									13	
86	7	19	43.5		52	48			1.1		70	Faint preceding movement.
87	8	10			i 39	17	40	16				
88	9	3							.3			
89	9	4					21		.9			
90	9	6							.0			
91	10	6							.0			
92	10	10							.0			
93	10	18							.5			
94	13	7							.9			

Scoresby-Sund.

No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks					
			P		S										
			m	s	h	m	s	m	s	h	m	h	m	°	
	1929														
	April														
95	13	21										.6			
96	16	15								.0					
97	17	3								.6					
98	19	21								17					
99	20	1								.4					
100	21	12								53					Recording interrupted until 12 <sup>h</sup> 53 <sup>m</sup> .
101	22	8								.7					
102	23	1										8			
103	27	12				2				.3					
104	27	21				38				1.1					
105	28	5								.7					
106	29	18								.9					
107	30	19				13				.6					
	May														
108	1	0								.3					
109	1	7				55.8		63.3		1.4					
110*	1*	15	46	40	54	2				48.7			50		Persia.
111	1	22								26.8					
112	2	14	36	37	45.2					.9			60		Kurile Islands.
113	3	9								.2					
114	3	16				36.6				.8					
115	4	4								.3					
116	4	6								.9					
117	6	5				28	23	37.7		1.0					New Guinea.
118	7	9								.8					
119	7	16				.9				1.4					New Guinea.
120	10	13								.0					
121	11	19								.6					
122	12	9				46.2				1.2					
123	12	20								13					
124	13	7								.0					
125	13	10								.1					
126	13	13				43.7									Persia. Preceding movement
127	17	0								.6					disturbed.
128	18	1								.5					
129*	18*	6	46	0	52	22		47.6	55.1				43		Asia Minor.
130*	20*	5	2	40	10.7			6.3					56		Aleutian Islands.
131	21	2								.9					
132	21	16	47.3		57.6					1.2					Japan.
133	22	20				.5				1.3					
134	24	19								.3					
135	25	4								.4					
136	25	12	12	10	22	21		12	46	23.4			74		Peru.
137	26	9						1.8		.7					
138	26	20								.0					
139*	26*	22	48.7		55	47		50	52	59.7					Pacific Ocean.
140	27	5						46		.9					
141	28	0	7	23	16.8					.6			68		
142	28	5								.8					Faint preceding movement.

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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	°	
143	1929 May 28	18					.5			
144	29	5					.3			
145	30	9	58.0		62 30	72.1	1.5			Argentine.
146	31	0		29 59			.7			Faint preceding movement.
147	June 1	9						30		
148	1	18	10.8	20.9			.6			
149*	2*	21	i 49 40	i 58 48	61 8				68	
150*	3*	20	38 44		40.7	49.7				Turkestan.
151	4	7			25					
152	4	15	29 5		33 19	39 4				Philippine Islands.
153	5	9					.4			
154	6	11	1 38	11.1	12.0				72	Atlantic Ocean.
155	6	14			.7					
156	6	16			10		.5			
157	7	1					.2			Faint.
158	8	18					.7			
159	9	1						.5		
160	9	7						18		
161	9	8			18.8	26.6				
162*	9*	9	18 30	27 2	28 27			35		63 Kurile Islands.
163	9	23			35		.7			
164	10	0			41		1.0			
165*	10*	23	i 5 44	i 7 42					10	Arctic Sea. Pacific Ocean.
166*	12*	12			2.3	4.8				
167	12	15					.1			
168*	13*	0	i 22 50	31 29	32.7				64	Kurile Islands. Mindanao region.
169*	13*	9	38 16		42.4	49 10	1.1			
170	13	20			.1		.7			
171	13	23	14		18.1		.9			
172	14	6					.7			
173	14	23			.6		1.2			
174	15	2					.7			
175	15	9			.3		.8			
176	15	17					.1			
177*	15*	19			53	59 40	1.5			Mindanao region.
178	15	21			.5		1.1			
179	16	15						.7		
180	16	22					.6			
181*	16*	23			7.1	i 7 32				New Zealand.
182	17	10	30.3		40 46	41 37	.2			Mindanao region. P uncertain.
183	17	14					.3			
184	18	2					.0			
185	19	4					.8			
186	19	7	44.4		55 7	55.9				Pacific Ocean.
187	19	13					.5			
188	20	0					.0			
189	20	18			.7		1.2			
190	20	20			34 49	35.6	1.0			Mindanao region.

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No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks			
			P		S								
			m	s	h	m	s	m	s	h	m		
	1929 June												
191	21	5			5.1		5.8	.7					Mindanao region.
192	22	16						.7					Recording interrupted until 16 <sup>h</sup> 29 <sup>m</sup> .
193	22	18			59.1								New Zealand.
194	22	22								37			
195	23	4						.1					
196	23	7						.3					
197	23	22			11 29		12.3	.8					Mindanao region.
198	24	18			49			1.1					
199	25	5						.0					
200	25	7						.0					
201	26	6	39 19	47.3	42.8			1.0			58		Aleutian Islands.
202	26	17	0 46	10.2				.4			72		Japan.
203	26	17						.9					
204*	27*	13	2 55		6 11		8 6	.7					South Sandwich Islands.
205	27	22						.5					
206*	27*	22	40.4	i 41 25				.6					
207	28	1			.2			.6					
208	28	2						.3					
209	30	2	58 28		62.4		69.9						Mindanao region.
210	30	5			.5			1.2					

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NOTES

- No. 5. Jan. 13. 0<sup>h</sup>. Kurile Islands. Large earthquake. No *Z* record. First forerunners large on *N*; *iPPP*, 15<sup>m</sup>53<sup>s</sup>, followed by large oscillations. *S* exceptionally large on *E*, followed by large movement, possibly other phases. *i<sub>E</sub>* 27<sup>m</sup>45<sup>s</sup> followed by very large movement, largest maxima in the record. *L* of long duration.
- No. 10. Jan. 16. 8<sup>h</sup>. Philippine Islands. Additional readings: 30<sup>m</sup>22<sup>s</sup>; *SS* 36<sup>m</sup>.0.
- No. 11. Jan. 17. 11<sup>h</sup>. Venezuela. No *Z* record. *P* quite small. *S* clearly marked on *N*. From *S* the movement has the appearance of *L* waves.
- No. 17. Jan. 24. 20<sup>h</sup>. Central America. *P*, *PP* and *PPP*, 52<sup>m</sup>40<sup>s</sup>, clearly marked on *E*, quite small on *N*. *S* small, not clearly marked, read on *E*; following movement larger. *SS* and *SSS*, 65<sup>m</sup>, large groups of oscillations. The beginning of *L* uncertain; *M* large, regular. There may be an error of some seconds in time-determination, since the rate of the clock has changed abruptly.
- No. 24. Febr. 1. 17<sup>h</sup>. Zéravchan;  $\Delta = c. 54^\circ$ . Deep focus (depth *c.* 200 km.). Strong movement follows *P*. On *Z*, *pP* 24<sup>m</sup>46<sup>s</sup> and *sS* 25<sup>m</sup>8<sup>s</sup> clearly marked. *S*; *iS* 32<sup>m</sup>53<sup>s</sup>; 34<sup>m</sup>.9 clearly marked on *N*. 37<sup>m</sup>.0 begins a group of very large oscillations. *L* small, irregular.
- No. 25. Febr. 2. 0<sup>h</sup>. Atlantic Ocean. The beginning of *P* quite small, the reading uncertain; increasing movement without clearly marked phases. *S* read on *E*; no corresponding movement on *N*; 21<sup>m</sup>37<sup>s</sup> clearly marked on *N* and *E*. After *S* continued strong movement without clearly marked phases.
- No. 34. Febr. 10. 15<sup>h</sup>. Central America. Phases not clearly marked. *P* quite small, the beginning possibly earlier than read. *SS* 64<sup>m</sup>.2. The beginning of *L* uncertain; some regular *M* groups.
- No. 39. Febr. 22. 20<sup>h</sup>. Atlantic Ocean. The beginning of *P* not quite certain. *S* large and well defined; in following movement distinct onsets. 67<sup>m</sup>.5 large oscillations (*iL*?), immediately followed by a few *M* groups.
- No. 40. Febr. 26. 9<sup>h</sup>. Alaska. *iP<sub>Z</sub>* possibly preceded by small movement. *S* not clearly marked.
- No. 52. March 7. 1<sup>h</sup>. Aleutian Islands. Very strong record. *P* very large, followed by large movement. *S* very large, earliest on *N*, possibly 52<sup>m</sup>11<sup>s</sup>, but not quite certain owing to strong preceding movement; *S<sub>E</sub>* 52<sup>m</sup>21<sup>s</sup>. Following movement very strong. *M* very large.
- No. 54. March 9. 11<sup>h</sup>. New Zealand region. Increasing movement without clearly marked phases. *L* begins about 11<sup>h</sup>.9—12<sup>h</sup>.0. Some regular *M* groups about 20 min. later.
- No. 56. March 10. 14<sup>h</sup>. Marianne Islands. Faint movement on *Z* 47<sup>m</sup>.5, possibly *P*. *PP* 51<sup>m</sup>53<sup>s</sup>. Distinct pulses 57<sup>m</sup>40<sup>s</sup>; 58<sup>m</sup>7<sup>s</sup>. *L* faint, the beginning uncertain.
- No. 68. March 19. 21<sup>h</sup>. Central America. The beginnings of later phases not clearly marked.
- No. 70. March 21. 2<sup>h</sup>. Central America. No *Z* record; *N* disturbed. The beginning of *L* uncertain.
- No. 110. May 1. 15<sup>h</sup>. Persia. Strong record. *iP* 46<sup>m</sup>41<sup>s</sup>, followed by strong movement. *PPP* 49<sup>m</sup>.7. On *N*, *S* clearly defined, *i* 54<sup>m</sup>2<sup>s</sup>; on *E* some increase of movement 53<sup>m</sup>52<sup>s</sup>; large movement begins *i* 54<sup>m</sup>13<sup>s</sup>. *i<sub>N</sub>* 58<sup>m</sup>.5 followed by very large movement.
- No. 129. May 18. 6<sup>h</sup>. Asia Minor. No *Z* record. *P* quite small, most clearly marked on *E*. *PP* larger. *S* large, clearly marked on *N* and *E*. *SS* large on *N*, hardly marked on *E*. On *N* strong movement continues into *L*, the beginning of which is uncertain.
- No. 130. May 20. 5<sup>h</sup>. Aleutian Islands. *P* small but distinct on *Z*. *S* small, not well defined. The beginning of *L* uncertain.
- No. 139. May 26. 22<sup>h</sup>. Pacific Ocean near Alaska. The beginning of *P* quite small, not clearly marked, followed by larger movement; *e* 48<sup>m</sup>52<sup>s</sup>. *S* large, read on *N*, begins later on *E*. *SS* immediately followed by movement of large amplitude and periods of about 1 min. Later *M* very large.
- No. 149. June 2. 21<sup>h</sup>. Two earthquakes, Japan Sea and Pacific Ocean according to *URSS*. No *N* record. *iP* 49<sup>m</sup>40<sup>s</sup>, well defined on *Z*, and *iS* 58<sup>m</sup>48<sup>s</sup>, sharp and large on *E*, seem to belong to the first earthquake; 61<sup>m</sup>8<sup>s</sup> possibly *S* of the second.
- No. 150. June 3. 20<sup>h</sup>. Turkestan. No *E* record. *S* quite small, the beginning uncertain, about 45<sup>m</sup>.9.
- No. 162. June 9. 9<sup>h</sup>. Kurile Islands. *E* record only. *P* small, the beginning not quite certain. *L* early, clearly marked.
- No. 165. June 10. 23<sup>h</sup>. Arctic Sea. *P* (dilatation) unusually large, marked by 3 large oscillations of period of about 16 sec. *S* large; *iS* read on *N*; on *E* earlier increase of movement, later large movement continued in large *L* group, *iL* 8<sup>m</sup>28<sup>s</sup>. On *N*, *L* clearly separated from *S*; *iL<sub>N</sub>* 9<sup>m</sup>4<sup>s</sup>. Regular *M* groups, period 10—12 sec.
- No. 166. June 12. 12<sup>h</sup>. Pacific Ocean. Distinct later phases, but beginnings not clearly marked.
- No. 168. June 13. 0<sup>h</sup>. Kurile Islands. *e<sub>Z</sub>* 24<sup>m</sup>49<sup>s</sup> seems to be *P* of a second shock; the corresponding *S* not clearly marked. *i* 36<sup>m</sup>23<sup>s</sup>, *P* of a third, stronger shock; *S* 45<sup>m</sup>1<sup>s</sup>.
- No. 169. June 13. 9<sup>h</sup>. Mindanao region. The beginning of *P* small, the reading not quite certain. *PP* well marked.  $\overline{S_e P_e S}$  and later phases, 50<sup>m</sup>.3; 51<sup>m</sup>8<sup>s</sup>; 56<sup>m</sup>.4, well defined on *N*. *L* earliest on *E*.

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NOTES

- No. 177. June 15. 19<sup>h</sup>. Mindanao region. Additional readings: 60<sup>m</sup>28<sup>s</sup>; 77<sup>m</sup>.1.  
No. 181. June 16. 23<sup>h</sup>. New Zealand.  $\Delta = 150^\circ$ . Several well marked phases, especially on *N*. *PP* 10<sup>m</sup>55<sup>s</sup>; 14<sup>m</sup>6<sup>s</sup>; *i<sub>N</sub>* 15<sup>m</sup>33<sup>s</sup>, a strong phase, on *N* only; 20<sup>m</sup>.4; 25<sup>m</sup>.6; 27<sup>m</sup>.6; *SS* 30<sup>m</sup>.3; 31<sup>m</sup>.4. *M* large, regular.  
No. 204. June 27. 13<sup>h</sup>. South Sandwich Islands. *P* small; *P'* larger. Phases most clearly marked on *N*, but no time-marks; largest phases about 9<sup>m</sup>.6; 17<sup>m</sup>; 24<sup>m</sup>; 28<sup>m</sup>. On *E* 12<sup>m</sup>48<sup>s</sup>; 15<sup>m</sup>.0. Large, regular *M*.  
No. 206. June 27. 22<sup>h</sup>.  $\Delta = c. 500$  km. *P* begins quite faintly, increases without distinct pulse; continued oscillations of about 10 sec. period. *i<sub>N</sub>* 41<sup>m</sup>25<sup>s</sup>; *e<sub>E</sub>* 41<sup>m</sup>.5; movement increases into regular *M* group of period of about 10 sec.