



1928

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DANMARK

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BULLETIN  
OF THE SEISMOLOGICAL STATION

# SCORESBY-SUND

NO. 1

JAN.—AUG. 1928

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The seismological station Scoresby-Sund in Eastern Greenland was erected during the winter 1927—28 by the Geodetic Institute of Copenhagen by funds granted by the Carlsberg foundation.

The station is equipped with 3 components Galitzin pendulums. The horizontal components have been working since Jan. 12th 1928, the vertical component has been working regularly since July 13th but, previous to this, it has occasionally been recording.

The work at the buildings which were build for the pendulums and for the recording apparatus was not entirely completed until the middle of May. Therefore recording has often been interrupted for several hours in the day and, if not actually interrupted, disturbed by the work. Also draught, occasioned by swift changes of temperature, seems to have caused some disturbance. Thus the records are not complete, and the readings here published do not perfectly represent the yielding power of the station under more favourable circumstances.

The time-marking clock has also suffered from frequent disturbances and abrupt changes of temperature, and though it has been controlled daily by Nauen scientific time signals, the uncertainty in time determinations may exceed a second.

Records from the station are only received once a year. The present bulletin contains the readings of all the records which were received in September 1928.

A detailed description of the station and its equipment will soon be published.

# Scoresby-Sund.

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

Lithologic foundation: Granite.

### Instruments:

Galitzin pendulums with photo-galvanometric registration, 3 components.

Constants (mean values):

Component	$l$	$T_1$	$A_1$	$\mu^2$	$T$	$k$
N	12.0	12.44	100	0	12.5	29; from $27/a$ 42
E	12.0	11.92	100	0	11.9	39
Z	14.1	10.12	100	0	9.5	34

### Seismometric readings: Notation

$P$  — normal first preliminary tremors, longitudinal waves.

$PP...$  — longitudinal waves reflected at the earth's surface.

$S$  — normal second preliminary tremors, transverse waves.

$SS...$  — transverse waves reflected at the earth's surface.

$PS; PPS; ...$  — waves reflected at the earth's surface which travel partly as longitudinal, partly as transverse waves.

$P'$  — longitudinal waves that have traversed the earth's central core.

$S_c P_c S$  — waves which traverse the mantle as transverse waves but are refracted through the core with longitudinal oscillation.

$P_c P_c S$  — waves which pass the mantle on one side of the core as longitudinal waves, on the other side as transverse waves and are refracted through the core with longitudinal oscillation.

$S_c P_c P_c S$  — waves which traverse the mantle as transverse waves, are refracted through the core with longitudinal vibration and are reflected on its inner boundary.

$L$  — long, or surface, waves; main phase.

$L'$  — surface waves travelling along the major arc to the station.

$M(M_1, M_2, ...)$  — waves of greatest amplitude in the surface waves.

$m(m_1, m_2, ...)$  — waves of greatest amplitude in other phases.

$C$  — regular waves at the end of main phase.

$F$  — end of discernible movement.

$i$  — sharply defined beginning of a phase.

$e$  — gradual beginning of a phase.

$\epsilon$  — beginning of a phase which is but faintly discernible.

$A_N, A_E, A_Z$  — half amplitude of earth motion measured from the position of equilibrium in microns (1 micron,  $\mu = 1/10^3$  mm) positive towards north, east or zenith.

$\Delta$  — arcual distance from the station to the epicenter.

## Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)	Period	Amplitude			Remarks	
							$A_N$	$A_E$	$A_Z$		
1	1928 Jan. 29		N	E	Z	h m s	sec	$\mu$	$\mu$	$\mu$	
2	" 30										
3	" 30										
4	Febr. 3										
5	" 7										
6	" 13										
7	" 21										
8	" 26										
9	" 26										

Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks											
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>												
		N	E	Z	h	m	s	sec	μ	μ	μ												
10	1928 March 7	P	e	e		11	2	21				△ = c. 36°. Felt in South of Italy											
													PP	e	e		3	44					
													S				8.0						
													SS	e			10.6						
															e		11.2						
													L				14						
													M <sub>1</sub>				15.7		26; 28		-4	-6	
													M <sub>2</sub>				18.7		18		-8		
													M <sub>3</sub>				20.7		16			7	
F				11.7																			
11	" 7		e	e		23	3.8																
																	10.1						
													L				23.3						
													M <sub>1</sub>				23	21.3	15		-8		
M <sub>2</sub>				21.9		18			6														
F				24.1																			
12	" 8				18	38																	
L				44																			
F				19.1																			
13	" 9	P	e	e	18	19	21																
													PP				23	1					
													S <sub>c</sub> P <sub>c</sub> S	e	e		30	4					
													S		e		31	4					
													PS				32	25					
													PPS				33.7						
													SS				37.8						
													SSS				41.7						
														e			45.4						
														e			50						
													L	e			53						
													"	e			55						
M <sub>1</sub>		e		19	5.1																		
M <sub>2</sub>				5.4																			
M <sub>3</sub>				7.4																			
M <sub>4</sub>				9.6																			
L'				20	17																		
C																							
F				22.1																			
14	" 13	PP	e	e	18	51.5																	
													S <sub>c</sub> P <sub>c</sub> S	e	e		57.0						
													S		e		59.0						
													PS	e			19	1.0					
													SS		e		7.3						
															e		18						
L				27																			
F				20.4																			

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Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks											
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>												
		N	E	Z	h	m	s	sec	μ	μ	μ												
15	1928 March 16	P'	e	e	5	20	20					△ = c. 135°.											
													PP	e	e	e	22	34					
													P <sub>c</sub> P <sub>c</sub> S	i	e	i	23	44					
													S <sub>c</sub> P <sub>c</sub> S	e			27	23					
															e	e	28.6						
													S <sub>c</sub> P <sub>c</sub> P <sub>c</sub> S	e	e	e	29.4						
															e		32	18					
																	50						
													S <sub>c</sub> P <sub>c</sub> S P	e	e	e	32.9						
																e	36.5						
													SS				40.0						
													SSS				44.9						
															e	e	55						
															e	e	59						
L				6	2																		
M <sub>1</sub>				10.6		25				102													
M <sub>2</sub>				12.2		23		318															
M <sub>3</sub>				16.2		21		255															
M <sub>4</sub>				17.3		19				129													
L'				57																			
M <sub>1</sub> '				7	1.9		18		75														
M <sub>2</sub> '				15.2		17			71														
M <sub>3</sub> '				16.3		19				42													
F				11.0																			
16	" 22	P	e	e	4	28	14					△ = 68°.8. Felt in Mexico.											
													"	e	i		19						
													PP	e	e		31.1						
													PPP	e	e		32	31					
														e			34	46					
															e	e	35.9						
													S	e	e	e	37	24					
													"	i	e	e	31						
														e			39	31					
													SS	e	e		42.1						
														e			43.4						
													SSS	e	e	e	44.2						
	e	e	e	46.5																			
			e	48.7																			
L				51																			
M <sub>1</sub>				5	0.7		18		708		On the N component the light is too faint in the maxima.												
M <sub>2</sub>				3.4		16		470															
L'				6.8																			
F				8.5																			
17	" 26	L			5	55	3																
													F				6.4						
				6.8																			

## Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks	
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
		N	E	Z	h	m	s	sec	μ	μ	μ		
18	1928 March 27				5	34							
		(L)	e	ε		37							
		L		e		43							
		F				6.3							
19	" 27		e	ε	8	43.4						Destructive in NE Italy.	
				e		47							
				e		48							
		M <sub>1</sub>				52.4		14			12		
		M <sub>2</sub>				52.7		14		-19			
		F				9.5							
20	" 27				19.5								
		L			20	6							
		M <sub>1</sub>				14.6		25			-12		
		M <sub>2</sub>				22.4		19		-6			
		F				20.9							
21	" 27	L			21	10						There is a faint preceding movement.	
		M <sub>1</sub>				15.5		22		6			
		M <sub>2</sub>				16.5		20			5		
		F				21.8							
22	" 29	P	e	ε	5	17	18					Δ = 69°.	
			e	ε		18	49						
		S	i	i		26	32						
		m				26.6		15; 13			-34		-69
				e		29	20						
		L*) F				6.7							
23	" 31	P			0	37	39					Δ = 41°. Destructive near Smyrna.	
		PP				39	13						
		S				43	51						
		SS	e			46	46						
		"		e		47.1							
		SSS		e		47	35						
				e		48	26						
		L				51							
		M <sub>1</sub>				53.9		18			-50		
		M <sub>2</sub> F				55.6		14		-65			
24	April 7	L			21	10							
		F				21.6							
25	" 9	L			18	32						No records from 17 <sup>h</sup> 26 <sup>m</sup> to 18 <sup>h</sup> 32 <sup>m</sup> . Felt in Peru.	
		F				(20.0)							

## Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks		
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>			
		N	E	Z	h	m	s	sec	μ	μ	μ			
26	1928 April 13-14	P		e	23	27	25					Δ = 70°. South of Mexico.		
		"		ε		27.7								
		S				36	42							
				ε		42.6								
		L		e		53								
		"		e		57								
		M <sub>1</sub>				58.6		19			-16			
		M <sub>2</sub>				0	0.2		18				-12	
		F				0.8								
		27	" 14	P	e	e	9	7	10					
PP						8	26							
PPP						40								
				e	e	55								
				e	e	9.3								
				e	e	9	46							
				e		11.0								
S						13	6							
SS						15.3								
L						18.5								
28	" 15	M <sub>1</sub>				26.9		13			107			
		M <sub>2</sub>				28.8		13		99				
		C						c. 11						
		F				11.2								
						22	28							
		F				22.7								
		29	" 16	L			9	0						
				F				9.7						
		30	" 17	P	e	ε	3	36	17					Δ = 66°. Felt in Mexico.
						e		37						
PPP				e		40	35							
S				e		45	10							
"				e		14								
				i	i	23								
PS						46	10							
				e		57								
				ε		49								
SSS				e		52.9								
31	" 18	L			4	3.9		23		64				
		M <sub>1</sub>				10.7		18			59			
		M <sub>2</sub>				5.5								
		F				4	18							
						22.2			18		7			
				4.9										

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Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks	
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
		N	E	Z	h	m	s	sec	μ	μ	μ		
32	April 18	P	e	e	19	30	4					$\Delta = 38^\circ$ . Destructive in Bulgaria.  There is an uncertainty of c. 3 sec. in the time determination.	
		PP	e	i	31	20							
			e		32	52							
		S			35	53							
		SS			37.8								
		L			40								
		M <sub>1</sub>			45.8		15		228				
		M <sub>2</sub>			46.9		14			226			
		C					c. 15						
		(L')			22	10							
		(L'')			22.7								
F			23.3										
33	" 18	P			23	22.1					Repetition of the preceding shock.		
		SS			30								
		L			37								
		F			23.9								
34	" 22		e	e	5	13	8						
			e	e	14	22							
			e	e	15	19							
		L			21								
		F			5.7								
35	" 22	L			20	34					Bulgaria.		
		M <sub>1</sub>			40.1		16	29					
		M <sub>2</sub>			40.4		15		15				
		F			21.3								
36	" 27	P			20	48	1				$\Delta = c. 92^\circ$ . Peru.		
		PP			51	36							
		$\frac{S_c P_c S}{S_c P_c P_c S}$			58.6								
		$\frac{S_c P_c P_c S}{PS}$			58	55							
					59.9								
					21	13.9							
		L			17								
		M			23.3		24	31					
		F			22.2								
					22.2								
37	May 1		e	e	0	40.3							
			e	e	46								
		L			1	12							
		M			20.2		17	3					
		F			1.8								
38	" 1	P			19	2	30				$\Delta = 41^\circ$ .		
		PP			4	13							
		S			8	42							
		SS			11.7								
		SSS			13.9								

Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>	
		N	E	Z	h	m	s	sec	μ	μ	μ	
38	May 1	L			16							
		M <sub>1</sub>			19.4		17			-24		
		M <sub>2</sub>			21.1		18			-26		
		F			20.7							
39	" 2	P			22	2	11					$\Delta = 41^\circ$ . Destructive in Anatolia.
		PP			3	46						
		S			8	23						
					9.0							
		SS	e	e	11.9							
		L			14							
		M <sub>1</sub>			19.4		18			-25		
		M <sub>2</sub>			19.5		18			25		
40	" 8	P	i	e	4	55	16					$\Delta = 53^\circ$ .
		PP			57.1							
		PPP			58	8						
		S			5	2	42					
		SS			6.1							
		SSS			7.9							
		L			10							
		M			10.5		13			7		
		F			6.1							
					6.1							
41	" 12		e		20	42						
				e	48	35						
				e	48.7							
				e	49.6							
		L			56							
		M <sub>1</sub>			58.2		20			4		
42	" 14	M <sub>2</sub>			21	3.6		13		-2		
		F			21.8							
					21.8							
43	" 14-15	L			3	54						
		F			4.4							
		P			22	27	20					
		S	e		37	48						
				i	50							
		m			38		14; 11			-58		
		PPS			39.3					33		
					41.7							
		SS	e		44							
			e	e	51							
44	" 14-15	L			55							
		M <sub>1</sub>			57.1		31			264		
		M <sub>2</sub>			58.5		28			190		
		M <sub>3</sub>			23	5.4	19			-75		
		M <sub>4</sub>			5.7		18			81		
		L'			0	39						
F <sup>*)</sup>												

\*) F in following.

## Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)	Period	Amplitude			Remarks
							A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>	
		N	E	Z	h m s	sec	μ	μ	μ	
44	1928 May 15	P S L M <sub>1</sub> M <sub>2</sub> F			2 48.8	21	7	5		Repetition of preceding shock.
					59 8					
					3 16					
					21.6					
					25.2					
					4.8					
45	" 15	L F	ε	ε	6 6					
					10.2					
					14.9					
					46					
					7.6					
46	" 16	P PPP S L " F			5 23.2				Δ = c. 59°.	
					26.9					
					31.3					
					42					
					44					
					6.2					
47	" 16	P S PS SS L F	ε	ε	8 9				Δ = c. 85°. La Paz gives Δ = 1760 km.	
					19 43					
					20.9					
					25.7					
					35					
					9.3					
48	" 17	L F			11 36					
					12.4					
49	" 18	L M F*)	ε	ε	2 32	19; 20	-4	3		*) in following.
					36					
					45					
					55.5					
50	" 18	L F			3 45					
					4.3					
51	" 19	L*)	ε	e	3 51.9					*) faint.
					4 4					
52	" 19	L M F			4 50	18	1			
					5 0.1					
					5.8					
53	" 19	L F			10 8					
					11.3					

## Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)	Period	Amplitude			Remarks
							A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>	
		N	E	Z	h m s	sec	μ	μ	μ	
54	1928 May 20	P PP S PPS SS L	i	ε	16 40 38					Δ = 71°. Felt near Tokyo.
					43.3					
					50 3					
					51.3					
					54.3					
					17 8					
55	" 21	L M F			2 53	8		1		
					59.8					
					3.3					
56	" 24	L M F			6 0	20	4			
					8					
					18.6					
57	" 24	L M <sub>1</sub> M <sub>2</sub> F			19 58	17	1	4		
					20 0.3					
					4.5					
58	" 26	L F			20.4	11				
					6 17					
					6.5					
59	" 26	F	ε	ε	8 53.1					
					54.7					
					9.4					
60	" 27	P PP S PS SS " SSS L " M <sub>1</sub> M <sub>2</sub> M <sub>3</sub> M <sub>4</sub> F	i	e	10 1 32					Δ = 69°. Sea of Japan.
					4 9					
					6.4					
					7.3					
					10 40					
					11.2					
					15.3					
					15 22					
					18.7					
					21					
					22					
					27.3					
27.8										
30.3										
32.8										
61	" 28	L M <sub>1</sub> M <sub>2</sub> F			(15.0)					
					7 13					
					18					
					39					
					48.4					
					51.4					
61	" 28	L M <sub>1</sub> M <sub>2</sub> F			7 13	23	11	5		
					18					
					39					
61	" 28	L M <sub>1</sub> M <sub>2</sub> F			7 13	20	11	5		
					18					
					39					
61	" 28	L M <sub>1</sub> M <sub>2</sub> F			7 13	20	11	5		
					18					
					39					

## Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks			
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>				
		N	E	Z	h	m	s	sec	μ	μ	μ				
62	1928 May 28	PP	ε	ε	Z	15	49	31				Aftershock to no. 60.			
													52.5		
													55 57		
													56.4		
													16 0		
													8		
													14.2	23	5
													19.2	18	-7
			17.3												
63	" 31	L	ε	ε	Z	7	46	14							
													8 2		
													9.5	19	4
													16.3	16	2
			8.7												
64	" 31	P	ε	ε	Z	14	1.3								
													11 32		
													17		
													32		
													37		
			15.0												
65	" 31	L	ε	ε	Z	21	19								
													23		
													26		
													31		
													48		
													50		
													53.5	27	5
													22.3		
66	" 31	L	ε	ε	Z	23	46.9								
													0 3.4		
													0.5		
													0 41.7	18	7
													44	17	-4
			2.0												
67	June 1	(P)	ε	ε	Z	12	33.8								
													44		
													59		
			13.4												
68	" 1	P	ε	ε	Z	13	23 30		+	+		Δ = 69°.			
													26.1		
													27.4		
													32 40		
													37.4		
													40.7		

## Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks			
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>				
		N	E	Z	h	m	s	sec	μ	μ	μ				
68	1928 June 1	L	ε	ε	Z	13	47								
													51.3	20	-12
													56.1	17	-24
													14 0.5	18	21
													16.5		
69	" 1	L	ε	ε	Z	22	26.5								
													45		
70	" 3	F	ε	ε	Z	3	58								
													4.3		
71	" 3	L	ε	ε	Z	7	10								
													17		
													27		
72	" 3	S	ε	ε	Z	8	45								
													52 34		
													9 7		
													9		
													19.6	18	12
			25.2	15	14										
			10.8												
73	" 3	L	ε	ε	Z	22	24								
													23 2		
													7.3		
74	" 4	L	ε	ε	Z	2	46								
													3.2		
75	" 7	F	ε	ε	Z	6	42 26								
													48		
76	" 8	L	ε	ε	Z	15	0								
													11		
													16		
													15.5		
													15 46.2	21	10
			49.1	19	5										
			17.3												
77	" 9	L	ε	ε	Z	3	14								
													3.7		



Scoresby-Sund.

No.	Date	Phase	Time (G. M. T.)	Period	Amplitude			Remarks
					A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>	
78	1928 June 15		<i>h m s</i>	<i>sec</i>	<i>μ</i>	<i>μ</i>	<i>μ</i>	$\Delta = c. 95^\circ$ . No <i>N</i> record.
		<i>P</i>	6 25.9					
		<i>PP</i>	29 41					
		<i>S<sub>c</sub>P<sub>c</sub>S</i>	36 28					
		<i>PS</i>	38					
			42					
			51					
		<i>L</i>	58					
		<i>M<sub>1</sub></i>	7 2.7	26		-42		
		<i>M<sub>2</sub></i>	10.7	20		70		
	9.5							
79	" 15	<i>L</i>	19 10				No records from 17 <sup>h</sup> 30 <sup>m</sup> to 19 <sup>h</sup> 10 <sup>m</sup> .	
		<i>F</i>	19.7					
80	" 17	<i>P</i>	3 30 42		+	-	$\Delta = 71^\circ$ . Mexico.	
		<i>m<sub>1</sub></i>	30.9	13		107		
		<i>m<sub>2</sub></i>	31.0	13		-128		
		<i>PP</i>	33 28					
		<i>PPP</i>	35 1					
		<i>m<sub>3</sub></i>	35.1	12		52		
			35 21					
			36 16					
			38 21					
		<i>S</i>	40 3					
		<i>PS</i>	40.8					
			42 7					
		<i>m<sub>4</sub></i>	42.2	13		136		
		<i>m<sub>5</sub></i>	42.3	14		-139		
		<i>SS</i>	45 1					
		"	24					
		<i>SSS</i>	47 51					
			49.8					
	51.3							
<i>L</i>	53				The light is too faint in the maxima.			
"	55							
	9.1							
81	" 17		7.0				Overlapped by preceding disturbance. <i>F</i> can not be determined.	
			7 18.9					
82	" 17	<i>P</i>	22 32.3				$\Delta = c. 70^\circ$ .	
		<i>S</i>	41.6					
		<i>SS</i>	48					
		<i>L</i>	58					
		"	23 0					
		<i>M<sub>1</sub></i>	3.5	22		-6		
		<i>M<sub>2</sub></i>	4.5	20		-4		
<i>F</i> <sup>*)</sup>					*) in following.			

Scoresby-Sund.

No.	Date	Phase	Time (G. M. T.)	Period	Amplitude			Remarks
					A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>	
83	1928 June 17-18		<i>h m s</i>	<i>sec</i>	<i>μ</i>	<i>μ</i>	<i>μ</i>	$\Delta = c. 70^\circ$ .
		<i>P</i>	23 36 6					
		<i>PPP</i>	40.4					
		<i>S</i>	45.4					
		<i>SS</i>	50					
		<i>L</i>	0 1					
		"	2					
		<i>M<sub>1</sub></i>	6.9	21		-13		
		<i>M<sub>2</sub></i>	8.0	20		7		
		<i>F</i>	1.0					
84	June 21	<i>PP</i>	11 1 9				$\Delta = c. 127^\circ$ .	
			2.6					
		<i>PPP</i>	4 18					
		<i>S<sub>c</sub>P<sub>c</sub>S</i>	6.2					
		<i>S<sub>c</sub>P<sub>c</sub>P<sub>c</sub>S</i>	8.6					
		<i>SS</i>	18 14					
		<i>SSS</i>	22.3					
		( <i>L</i> )	32					
		<i>L</i>	46					
		<i>M<sub>1</sub></i>	52.5	20		23		
		<i>M<sub>2</sub></i>	53.3	19		-14		
		<i>L'</i>	12 44					
<i>F</i>	14.2							
85	" 21	<i>L</i>	18 42				No records from 16 <sup>h</sup> 38 <sup>m</sup> to 18 <sup>h</sup> 42 <sup>m</sup> .	
		<i>L'</i>	19 12					
		<i>M<sub>1</sub>'</i>	17.4	22		4		
		<i>M<sub>2</sub>'</i>	19.1	21		7		
		<i>M<sub>3</sub>'</i>	29.2	18		7		
		<i>F</i>	20.8					
			20.8					
86	" 23	<i>L</i>	7 45					
		<i>F</i>	7.9					
87	" 24		c. 4 44				No time-marks.	
88	" 25		7 45					
			47					
			52					
		<i>L</i>	8 8					
	8.7							
89	" 29	( <i>S<sub>c</sub>P<sub>c</sub>S</i> )	20 4 27					
			8					
		<i>L</i>	36					
		<i>F</i>	20.9					

## Scoresby-Sund.

No.	Date	Phase	Time (G. M. T.)	Period	Amplitude			Remarks				
					A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>					
		N E Z	h m s	sec	μ	μ	μ					
90	1928 June 29-30	PP	23 10 18					Δ = c. 120°.				
									ε ε	15.8		
		S <sub>c</sub> P <sub>c</sub> S	18.4						ε			
										ε	20	
		PS	27.2						e e			
		SS	31.8									
		SSS	41						50	-192		
		L	42.4									
		M <sub>1</sub>	48.8								24	-32
		M <sub>2</sub>	53.7								22	30
M <sub>3</sub>	56.6	20	-43									
M <sub>4</sub>												
F	2.6											
91	July 1	(L)	9 49									
									ε	53		
		L	10 5.2						19	4		
		M <sub>1</sub>	6.7						19	4		
		M <sub>2</sub>	10.6									
F												
92	" 2	L	2 41									
									F	2.9		
93	" 2	L	10 11									
									ε	16		
94	" 6	L	1 7									
									ε ε	15.2		
95	" 7	P	3 45 8					Δ = c. 70°.				
									ε ε	23		
96	" 8	(L)	12 25									
									ε	26		
97	" 8	L	4 7	13	13	-4	3					
									ε	30		
98	" 8	M <sub>1</sub>	17.8									
									ε	20.4		
99	" 8	M <sub>2</sub>	20.4									
									ε	4.8		
100	" 8	F	4.8									
									ε	1.9		
101	" 8	L	9 56.9									
									ε	10 29		
102	" 8	M	10 29									
									ε	32.7		
103	" 8	F	11.2									
									ε	11.2		
104	" 8	P	9 41 22					Δ = 41°. Destructive at Smyrna and Torbali.				
									ε	42.9		
105	" 8	PP	42.9									
									ε	43 21		
106	" 8	PPP	43 21									
									ε	45.3		
107	" 8	S	47 33									
									ε	46		
108	" 8	SS	50.7									
									ε	52.1		
109	" 8	SSS	52.1									
									ε	54		
110	" 8	L	54									
									ε	57.4		
111	" 8	M <sub>1</sub>	57.4	22			4					
									ε	59.2		
112	" 8	M <sub>2</sub>	59.2	15			-5					
									ε	10.8		
113	" 8	F	10.8									
									ε			

## Scoresby-Sund.

No.	Date	Phase	Time (G. M. T.)	Period	Amplitude			Remarks		
					A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>			
		N E Z	h m s	sec	μ	μ	μ			
97	1928 July 9	PP	21 44.2					Δ = c. 120°.		
									ε	47.2
		PPP	49.3							
		ε ε	50.8							
		S <sub>c</sub> P <sub>c</sub> S	51.4							
		ε	51.8							
		S <sub>c</sub> P <sub>c</sub> P <sub>c</sub> S	53.4							
		ε	55.7							
		PS	22 14						17	14
		PPS	16							
(L)	27	20	-20							
L	29.9									
M <sub>1</sub>	36.6									
M <sub>2</sub>	24.3									
F										
98	" 10	P	2 13.9					Δ = c. 70°.		
									e	15.2
99	" 10	S	23.3							
									ε	40
100	" 10	L	45.2	21	-9		2			
									ε	50.1
101	" 10	M <sub>1</sub>	50.1	16						
									ε	3.4
102	" 10	M <sub>2</sub>	3.4							
									ε	3 13.2
103	" 10	F	13 44							
									ε	31
104	" 10	L	4 3							
									ε	12.2
105	" 10	M <sub>1</sub>	12.2	18	2					
									ε	12.5
106	" 10	M <sub>2</sub>	12.5	18						
									ε	58
107	" 10	L'	58							
									ε	5.3
108	" 10	F	5.3							
									ε	9 56.9
109	" 10	L	10 29							
									ε	10 29
110	" 10	M	32.7	23	8					
									ε	11.2
111	" 10	F	11.2							
									ε	9 41 22
112	" 10	P	9 41 22							
									ε	42.9
113	" 10	PP	42.9							
									ε	43 21
114	" 10	PPP	43 21							
									ε	45.3
115	" 10	S	47 33							
									ε	46
116	" 10	SS	50.7							
									ε	52.1
117	" 10	SSS	52.1							
									ε	54
118	" 10	L	54							
									ε	57.4
119	" 10	M <sub>1</sub>	57.4	22			4			
									ε	59.2
120	" 10	M <sub>2</sub>	59.2	15			-5			
									ε	10.8
121	" 10	F	10.8							
									ε	

Scoresby-Sund.

No.	Date	Phase	Time (G. M. T.)	Period	Amplitude			Remarks	
					A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
102	1928 July 18	P  S S <sub>c</sub> P <sub>c</sub> S m PS SS SSS (L) L M <sub>1</sub> M <sub>2</sub> M <sub>3</sub> M <sub>4</sub> C F	N E Z i i i e	h m s 19 17 38 18.9 28 4 12	sec	μ	μ	μ	Δ = 83°. Destructive in Peru.
			16	70					
			34		-100				
			27	111					
			18		45				
			17	-65					
			17-18						
103	" 19	F	2 9 17						
104	" 19-20	e e e e e e e e e e e e L M (L) F	23 57 53 57.9 59.6 0 8.2 10 12 17 21 40 42.1 1.6 2.0	21	-3				
105	" 21	e e e e e e e e e L F	2 59 3 2.2 5.3 8.6 20 32 41 4.4						
106	" 21	L F	7 11 7.6						
107	" 22	P S  SS SSS	N E Z e	7 39.5 49 0 47 53 56.4				Δ = c. 72°.	

Scoresby-Sund.

No.	Date	Phase	Time (G. M. T.)	Period	Amplitude			Remarks	
					A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>		
107	1928 July 22	L M <sub>1</sub> L M <sub>2</sub> F	N E Z e	h m s 8 5 8.3 10 13.2 9.1	sec	μ	μ	μ	
			21	2					
			17		3				
108	" 23	e e e e L M F	e e e e e	8 5 15.8 26 32 58 9 7.0 10.0	20	2			
109	" 23	L F	16.5 17.6						
110	" 25	L F	19 25 19.7						
111	" 26	L F	13 26 13.7						
112	" 26	e e e M F	e e e	19 37 38.7 45	7		-2		
113	" 27	L F	16 15 16.7						
114	" 28	PP S <sub>c</sub> P <sub>c</sub> S PS SS  L M F	20 9.0 15.6 18 3 24 42 44 49.4 21.4					Δ = c. 102°.	
115	" 30	e e e e e e L " M <sub>1</sub> M <sub>2</sub> F	e e e e e e	2 55.1 59.6 3 4 8 10 27.2 27.8 4.2	17 16		11 -10		
116	" 30	L F	7 48 57						

Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>	
		N	E	Z	h	m	s	sec	μ	μ	μ	
117	1928 Aug. 1				19	6						
		F				13						
118	" 1	L			19	50						This and the two following shocks were felt in Iceland.
		M <sub>1</sub>				52.9	8		-4			
		M <sub>2</sub>				53.0	7	4				
		F				20.2						
119	" 1	L			20	31.5						*) in following.
		M <sub>1</sub>				32.5	14		-4			
		M <sub>2</sub>				34.7	7		5			
		M <sub>3</sub> F*)				34.9	7	4				
120	" 1	L			20	49.5						
		M <sub>1</sub>				52.5	8			4		
		M <sub>2</sub>				52.7	7	-4				
		F				21.2						
121	" 2		ε		6	49						
			ε	ε		53.5						
			ε	ε		57						
		L			7	3						
		M <sub>1</sub>				8.5	18	4				
		M <sub>2</sub>				9.8	16		2			
		F				7.6						
122	" 3	L			7	32						
		F				7.9						
123	" 4				18	50*)						
		L			19	1						
		M <sub>1</sub>				10.0		-360		450		
		M <sub>2</sub>				12.4						
		M <sub>3</sub>				12.9						
		M <sub>4</sub>				15.5		310				
		M <sub>5</sub>				16.0			200			
		C F				23.4	16-20					
124	" 5	P			14	54.9						Δ = c. 87°.
		PP				58						
		S <sub>c</sub> P <sub>c</sub> S			15	5.4						
		PPS				7.0						
		SS				11						
						18						
		L				29						
		M <sub>1</sub> M <sub>2</sub> F				38.4 39.2 16.2	22 20		2 4			

Scoresby-Sund.

No.	Date	Phase			Time (G. M. T.)			Period	Amplitude			Remarks
									A <sub>N</sub>	A <sub>E</sub>	A <sub>Z</sub>	
		N	E	Z	h	m	s	sec	μ	μ	μ	
125	1928 Aug. 7				20	37						
		F				43						
126	" 8	L			3	21						
		F				3.7						
127	" 9	L			4	23						
		F				4.7						
128	" 10	P	e	e	15	43	13					Δ = 55°.
		S	e	e		50	50					
						52.4						
		SS				54.4						
		SSS				56						
		L				16.0						
		F				16.3						
129	" 12	P	e		8	23.1						Δ = c. 103°.
		"	e			23.6						
		P	e			26.9						
		PP	e			27	29					
			e			27.9						
		S <sub>c</sub> P <sub>c</sub> S	e	e		33	15					
		S <sub>c</sub> P <sub>c</sub> P <sub>c</sub> S	e	e		34.0						
		PS	e			36						
		SS				41.9						
		SSS				45.4						
			e			52						
		L				9.0						
		F				10.8						
130	" 13				3	51.1						
		L				4	6					
		M <sub>1</sub>				16.1	19			2		
		M <sub>2</sub> F				16.4 4.7	17		2			
131	" 15	P			15	47						
		S				52.9						
		L				59						
		F				16.3						

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: Granite.

No. 2. Aug.—Dec. 1928.

Instruments:

Galitzin pendulums with galvanometric registration.

Constants:

Component	$l$	$T_1$	$A_1$	$T$	$k$
	cm	sec	cm	sec	
<i>N</i>	12.0	12.4	100	11	70
<i>E</i>	12.0	11.9	100	10	65
<i>Z</i>	14.1	10.1	100		

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<sup>s</sup> to 4<sup>s</sup>.

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						
	1928 Aug.		m s	m s	h m s	m s	h m	h m	°	
1	15	18								L; beginning disturbed.
2	16	7					.8			
3	17	19						35		Seismic?
4	19	3					.0			
5	19	4					.6			
6	20	2			16.4					
7	22	7					.3			
8	22	20						24		
9*	23*	1			34 31					Sea of Okhotsk.
10	23	4			.1		.4			
11	23	6						.5		Alger.
12	24	9			52.9					
13*	24*	22			4.0	12.7				
14	25	0					.3			
15	25	2					.4			
16	26	5					.1			Faint.
17	26	6					.1			
18	28	2					.0			
19	28	8			.9		1.3			
20	28	10					.4			
21	29	2						19		
22	29	3					.7			
23	29	5			46					Not very distant.
24	29	8					.0			
25	29	10					.6			No records 29 <sup>d</sup> 16 <sup>h</sup> 33 <sup>m</sup> —19 <sup>h</sup> 30 <sup>m</sup> .
26	30	7					.3			
27	30	22					.6			
	Sept.									
28*	1*	6	19.7	28 17	35.2		.7		63	Northern India.
29	2	0	5 20	14.5	18.9				69	Central America.
30	6	6		48 59			1.1			
31	6	9						.9		
										No records 6 <sup>d</sup> 23 <sup>h</sup> —7 <sup>d</sup> 11 <sup>h</sup> .
32	11	1			6 23		.5			E record only.
33*	11*	12	47 3*	54 38	49.5	58.7	2		54	Pacific Ocean.
34	11	22						.1		
35	12	1			41.5					Distant; phases not clearly marked.
36	13	3			54.3		1.4			Faint preceding movement. No records 18 <sup>d</sup> 15 <sup>h</sup> —20 <sup>h</sup> . Bay of Aden.
37	18	20	4.1	13.5			.5			
38	19	3					.3			
39	19	8	27 54	38.1			.9		80	
40	21	13	39.8	50.0	43.4		1.1			Peru.
41	22	7					.1			
42	22	7			51 54	61 55	1.4			West of New Hebrides.
43	23	14					.4			
44	24	10					.2			
45	25	5			19 47					Japan.

## Scoresby-Sund.

No.	Date	Hour	Forerunners				L	Un- defined	△	Remarks
			P	S						
	1928 Sept.		m s	m s	h m s	m s	h m	h m	°	
46	25	8	13 13	21.7			.6		63	Japan.
47*	27*	0	54.6	63 10	63 41	70.4	1.2		63	Lesser Antilles.
	Oct.									
48	3	1					.3			
49*	9*	3	12 20	21 32	15.0	16 50			69	Mexico.
50	12	0					.1			
51	12	7		48 44			1.0			
52	13	13					.8			
53	13	16					.1			Disturbed.
54	15	9					.5			
55	15	14	30 12	38.9	32 24	46.0	.9		64	N record only. S faint.
56	19	10			.7		1.5			No records 23 <sup>d</sup> 17 <sup>h</sup> 2 <sup>m</sup> —18 <sup>h</sup> 52 <sup>m</sup> .
57	25	12			54		1.1			
58	28	15					.2			
59	30	5					.0			
60	31	20					.7			
	Nov.									
61	1	4	23 23				.7			Mexico.
62*	6*	4			26 19	27.5	1.0			Loyalty Islands.
63	7	15			42.9		.9			
64	11	23					.8			
65	15	13						.6		
66*	20*	20	48 52		59.4	60 44	1.3		37	Chile.
67	27	9								
68	28	2					.1			
69	28	7					.8			
70*	28*	11			2.7	12.6	.6			Sunda Islands.
71	29	16					.9			
72	29	18			23.3		1.2			South of Tonga Islands.
73	30	0					.4			" " " "
	Dec.									
74*	1*	4	21.0		25 35	35 4	.9			Chile.
75	2	4			49.3	55.3	1.2			"
76	2	22					.56			Not very distant.
77	3	13					.0			
78	7	9						.7		Strong microseims.
79	9	0					.9			Salomon Islands.
80	9	5			35		1.0			" "
81	9	18			40		1.0			" "
82	10	5					.5			
83*	12*	20			41 43	42 37			54	NE of New Zealand.
84	14	0								
85	14	2					.9			
86*	19*	11			55.1	61.7			.4	Mindanao.
87	21	6								
88	22	14					.8			
89	26	21			55.4		1.2			
90*	28*	14			40	44.1	1.1			Mindanao.

## Scoresby-Sund.

## NOTES

- No. 9. Aug. 23. 1<sup>h</sup>. Sea of Okhotsk. *E* record only. 34<sup>m</sup>31<sup>s</sup> clearly marked, presumably *S*. The rest of the record faint.
- No. 13. Aug. 24. 22<sup>h</sup>. Several later phases, but not clearly marked.
- No. 28. Sept. 1. 6<sup>h</sup>. Northern India. *E* record only. *P* and *S* distinct phases, but beginning of *P* uncertain. *SSS* clearly marked.
- No. 33. Sept. 11. 12<sup>h</sup>. Pacific Ocean. *E* record only. *P* small, beginning uncertain, possibly in time-break. *S* clearly marked. 55<sup>m</sup>.9 another phase seems to begin. *SS* prominent. In *M* a period of about 12<sup>s</sup>.
- No. 47. Sept. 27. 0<sup>h</sup>. Lesser Antilles. *P* not clearly marked. On *E*, *S* and *PS* well defined. 64<sup>m</sup>28<sup>s</sup> a phase, most clearly marked on *N*, possibly  $\overline{S_c P_c S}$ . *SS*, 68<sup>m</sup>.0, small. *SSS* well marked on *N*. The beginning of *L* has long periods; *M* small.
- No. 49. Oct. 9. 3<sup>h</sup>. Mexico. Very strong record. *P* large, but owing to microseismic movement the beginning not quite certain;  $P_E$ ,  $P_Z$  12<sup>m</sup>20<sup>s</sup>,  $P_N$  12<sup>m</sup>28<sup>s</sup>. *PP* not strong, *PPP* larger and followed by continued strong movement. *S* not very clearly marked owing to strong preceding movement; followed by very large movement. *L* very large, the beginning uncertain.
- No. 62. Nov. 6. 4<sup>h</sup>. Loyalty Islands;  $\Delta = c. 130^\circ$ . On *Z* faint movement precedes *PP*, 26<sup>m</sup>19<sup>s</sup>.  $\overline{P_c P_c S}$ , 27<sup>m</sup>.5, clearly marked on *N*. Later forerunners largest on *N*; *PS*, 38<sup>m</sup>.0; other phases not clearly marked. *L* not large.
- No. 66. Nov. 20. 20<sup>h</sup>. North Chile;  $\Delta = c. 100^\circ$ . Masked by microseisms. *P* small, but distinct on *Z*. *PP*, 52<sup>m</sup>.8, not much larger. Previous to  $\overline{S_c P_c S}$ , 59<sup>m</sup>.4, some increase of movement.  $S_n$ , 60<sup>m</sup>44<sup>s</sup>, sharp on *N*. The beginning of *PS*, c. 61<sup>m</sup>.6, not certain; later increase of movement due to *PPS*. *SS* 66<sup>m</sup>.2. Regular *M* group about 21<sup>h</sup>.5.
- No. 70. Nov. 28. 11<sup>h</sup>. Sunda Islands. Quite strong forerunners, but disturbed by microseisms and not very clearly marked. *M* not large, but of long duration.
- No. 74. Dec. 1. 4<sup>h</sup>. Chile;  $\Delta = 112^\circ$ . *E* record only. *P* faint. 25<sup>m</sup>.2 increase of movement preceding *PP*, 25<sup>m</sup>35<sup>s</sup>, strong and clearly marked. *PPP*, 25<sup>m</sup>50<sup>s</sup>, and  $\overline{S_c P_c S}$ , 31<sup>m</sup>39<sup>s</sup>, well defined. Some other phases, less clearly marked, precede *PS* 35<sup>m</sup>4<sup>s</sup>, large and sharp. *SS* 40<sup>m</sup>.9. The beginning of *L* uncertain owing to large preceding movement. Large *M* group c. 5<sup>h</sup>.2.
- No. 83. Dec. 12. 20<sup>h</sup>. NE of New Zeland;  $\Delta = c. 140^\circ$ .  $P'$  41<sup>m</sup>43<sup>s</sup>;  $\overline{P_c P_c S}$  42<sup>m</sup>37<sup>s</sup>. Later phases not clearly marked. The beginning of *L* uncertain, c. 21<sup>h</sup>.4; several regular *M* groups.
- No. 86. Dec. 19. 11<sup>h</sup>. Mindanao;  $\Delta = c. 100^\circ$ . Strong record, but phases not clearly marked. Faint beginning c. 51<sup>m</sup>.7. *PP* 55<sup>m</sup>.1. After 61<sup>m</sup>.7 strong, increasing movement. Some large oscillations. 78<sup>m</sup>, possibly the beginning of *L*. Large *M* groups.
- No. 90. Dec. 28. 14<sup>h</sup>. Mindanao,  $\Delta = c. 100^\circ$ . No *N* record. Faint beginning; after 44<sup>m</sup>.1 continued irregular movement without well-marked phases. The beginning of *L* not certain; regular *M* group about 82<sup>m</sup>.