

No. 2

BULLETIN OF THE SEISMOLOGICAL STATION

L U N D

1928

$\phi = 55^{\circ} 42' N$; $\lambda = 13^{\circ} 11' E$; $h = 32 m$
Sub-soil: Moraines, glacial till, depth about 100 m, on cretaceous limestone.

Observatory . Lund . Sweden

Instrument: WIECHERT 1000 Kg. horizontal Seismograph.
Constants:

Component		T	v	r	V
		sec.		mm.	
NE		11.4	3.5	0.6	160
NW	1/1-21/6	11.5	5	0.6	190
"	21/6-31/12	11.9	6	0.8	190

SIEMENS clock controlled daily by NAUEN ONOGO signals.
The seismographic records are read in the GEODETIC INSTITUTE,
Copenhagen, Denmark.

No.	Date	Hour	Forerunners				L	Undef.	Δ	Remarks		
			P		S							
		h	m	s	m	s	h	m	h	m	o	
1	Jan.	9				49.3		1.2				
2	1	19				1 42						
3	4	21				55 0		82				
4	5	14						31				
5 ^x	6 ^x	19	41	52	49	46	44	6		57	British East Africa	
6	10	3						.0				
7	12	13				35.7		66				
8	18	13						.2				
9	22	0						29				
10	26	22						44				
11	30	4						4				
	Febr.											
12 ^x	3 ^x	13	55	59	62	44	57	49	66	16	46	Siberia
13	4	7						4				
14	6	4						40				
15	7	0			24.5	29.8						Indian Ocean
16	10	5				1.8		.3				
17	12	7						8				
18 ^x	13 ^x	5				58.7		1.4				
19	21 ^x	19	58	50	66	46		76		58	Siberia	
20	24	14						.6				
21	26	1			36	59		47				
22	29	23						.4				
	March											
23	7	10								8		
24 ^x	7 ^x	10	59	9	62	27				18	South Italy	
25	7	22	53.5		61	38		73		61	China	
26	8	18					33	.7				
27	9	1						11				
28	9	11						.8				
29 ^x	9 ^x	18	18	1	28	18	33	45		81	Indian Ocean	
30	12	17						45				

No.	Date	Hour	Forerunners				L	Undef.	△	Remarks		
			P		S							
			m	s	m	s	h	m	h	m	o	
85	May 26	6					1.5					Apulia
86	26	8					53.4					
87 ^x	27 ^x	10	i 2	8	11	47	4	57	i 12	11		74 Japan
88	28	7							.1			
89	28	15	47	25 ^x	57.1						74	Japan
90	30	20							8			Italy
91	31	7	37.7		47.4							Faint. Japan
92	31	14			11	34						Japan
93	31	21							.7			
June												
94	1	0							.3			
95	1	13								3		
96 ^x	1 ^x	13	24	7	33	48	34	11			74	Japan
97	1	19							.1			
98	1	22							.8			
99	2	20									27	
100	3	8			52	47						Japan. P uncertain
101	3	10								1		
102	5	6								37		
103	7	6			43	3 ^x					4	
104	7	13										
105	8	15							.7			
106	14	16								55		
107 ^x	15 ^x	6	25	33					.9			Philippine Islands
108	15	17					40	5	1.0			" "
109 ^x	17 ^x	3	i 32	19	i 43	17	42.4				44.1	Mexico
110	17	7		0.5								In preceding movement
111	17	23							.1			
112	17	23					48		1.1			
113	21	11					.0			37		
114 ^x	21 ^x	16			46	17	47	47		58		Earlier forerunners
115	24	4	42	33 ^x			52	10				Two earthquakes (disturbed)
116	29	20								29		
117 ^x	29 ^x	23					11.8	34	48	48		
July												
118	4	18							.5			
119	4	22					1.3		.4			
120	7	18			21.6					37		
121	9	21					44	36	1.3			
122	10	2								48		
123	11	4							.3			
124 ^x	15 ^x	9	38	5	41	40				44		19 Asia Minor
125 ^x	18 ^x	19	18	30 ^x	29	55	29	13		45		Peru
126	20	0					7.4			32		
127	28	20							.9			
128	29	18							.4			
129	30	3							.4			
130	31	20							.2			
Aug.												
131	3	11	55	7 ^x	63.6						63	Atlantic Ocean
132	4	4					26.7					Italy
133	4	7							.4			
134 ^x	4 ^x	18	39	7			49	23	1.1			Mexico
												5d.-6d. 8h. no records

No.	Date	Hour	Forerunners				L	Undef.	△	Remarks			
			P		S						h	m	h
	Aug.	h	m	s	m	s	h	m	h	m	o		
135	10	15	41	26	47	35					41	Long waves very faint.	
136	12	8					26.7					32 58 ^x	
137	15	12							18				
138	15	17					33 17					38 33	Argentine
139	16	7					56					61	
140	19	4										21	
141	20	2							.6				
142	21	19					9					26	Persia
143	23	4			7.5							14	Turkestan
144	24	9	49	12	53	17						56	23 Alger
145	24	22					2 34					i 6 5	Probably more than one
146	25	0							.5				(earthquake
147	25	21										15	Faint preceding movement
148	29	18							.0				
149	30	6			53	30			1.2				Faint
150	30	12							.8				
151 ^x	Sept. 1 ^x	6			17.8								48 Hindustani
152	2	0					17 18		.6				
153	7	3							.8				
154	11	1							.6				
155	11	12										57 57	Pacific Ocean
156	12	1										.7	Faint
157	13	3					50.9					75	
158 ^x	18 ^x	17	29	59	38	27 ^x							62 Atlantic Ocean
159 ^x	18 ^x	20			9.1 ^x				.3				Indian Ocean
160	19	8					38.7		1.1				
161 ^x	22 ^x	7					53 8					54 6	New Hebrides
162	25	8			23.7							39	
163	27	0	55	25	4	40 ^x						17	Faint Caribbean Sea
164	Oct. 3	1										10	
165	4	11										27	
166	4	18										.8	Faint preceding movement
167 ^x	9 ^x	3	14	2	39	43	24 42	25 1	.7				S.W. Abessinia
168	12	0							.4				Mexico
169	12	7			50	24			1.1				
170	13	15					41 37		1.2				
171	15	9							.5				
172 ^x	15 ^x	14	28	12	35	4 ^x	38.5						48 Belutchistan
173	17	16							.4				
174	19	11					14.2		.7				
175	20	13							.5				Faint forerunners
176	21	17							.2				
177	23	18			12.5				.4				
178	25	12					56 41		1.2				Nicaragua
179	31	20							.8				Faint forerunners
180	Nov. 1	4	25	18									
181	6	4					36 23		.9				Mexico
182	10	13					24.7	27.1	1.1				Loyalty Islands
183	11	23							.8				" "
184	14	4							.5				" "
185 ^x	20 ^x	20										57	
							53 35	62 53				81	Chile

No.	Date	Hour	Forerunners				L	Undef.	Δ	Remarks		
			P		S							
		h	m	s	m	s	h	m	h	m	o	
186	Nov. 22	9			6.0		1.4					Some preceding movement
187	28	7					.9					
188 ^x	28 ^x	11			2	4	11	8	33			Sunda Islands
189	29	19					.3					Faint forerunners
190	30	0					.5					
191 ^x	Dec. 1 ^x	4			26	0	35	50				Chile
192	1	10					.4					
193	1	19					.6					
194 ^x	2 ^x	4			40	18	50.1					Chile
195	3	5						39				
196	7	10					.1					Some preceding movement
197	9	1					.0					
198	9	6					.1					
199	9	19					.2					
200	10	7	7.7	11	26							Interrupted. Crete
201 ^x	12 ^x	20			39	42	43.3	1.6				NE of New Zealand
202	13	3							28			
203	14	0					.9					
204 ^x	19 ^x	11	51	25			1.4					Mindanao
205 ^x	28 ^x	14			43	37	1.1					Mindanao

^x affixed to number and date refers to Notes.

^x affixed to time of phase indicates that beginning of phase is in time-mark.

No.	Notes
5.	January 6. 19 ^h . British East Africa. Forerunners clearest on NW. On NE L-waves of long period begin about 58 ^m . Irregular, not large M group begins in both diagrams ca. 71 ^m .
12.	February 3. 13 ^h . Siberia. Faint forerunners, clearly marked on NE. M largest on NW; short and long periods superposed.
19.	February 21. 19 ^h . Siberia. P weak, S rather large. The long-period waves in the beginning of L have large amplitudes on NW. Later M not large, largest on NW.
24.	March 7. 10 ^h . South Italy. P large, partly in hour mark. S small, clearly marked on NE. The beginning of L uncertain; M irregular, not large.
29.	March 9. 18 ^h . Indian Ocean. Very strong record. Forerunners stronger on NW. The phases very clearly marked, but the beginnings not always well defined. P begins faintly 18 ^m 1 ^s on NW; strong movement sets in on both 18 ^m 9 ^s . PP 21 ^m 9 ^s and stronger 21 ^m 25 ^s , a little smaller than P; PPP 23 ^m 19 ^s . S distinctly 28 ^m 18 ^s (compare København: e 28 ^m 16 ^s ; i S 28 ^m 30 ^s). PS 29 ^m 27 ^s ; SS very large 33 ^m 45 ^s ; SSS 37 ^m 6. The beginning of L irregular; large M groups about 19 ^h 0.
31.	March 13. 18 ^h . New Pommern region $\Delta = \text{ca. } 120^\circ$. Distinct phases on NE only. PP 52 ^m 4 and $\overline{S_c P_c S}$ 58 ^m 53 ^s are the strongest. $\overline{S_c P_c S}$ 57 ^m 4. L earlier on NW.
32.	March 16. 5 ^h . Loyalty Islands region $\Delta = \text{ca. } 145^\circ$. Quite strong record. P' 20 ^m 43 ^s begins faintly, the reading uncertain; PP 23 ^m 57 ^s , $\overline{P_c P_c S}$ 24 ^m 46 ^s , both clearly marked on NE, the latter large; PPS _{NE} 36 ^m 23 ^s ; SS 42 ^m 4; SSS 47 ^m 5. There are other phases but not clearly marked. On NW long-period L waves of large amplitude from 63 to 70 ^m . From ca 80 ^m regular M groups on both.
34.	March 22. 4 ^h . Mexico. 15°54' N 96°23' W according to Mexico, $\Delta = 87^\circ 5'$. P and PP 33 ^m 17 ^s large and well defined on NW, about equally large. $\overline{S_c P_c S}$ large and clearly marked on NW, hardly visible on NE; S _n big on both, but better defined on NE, owing to the absence of $\overline{S_c P_c S}$; PS well-defined and large on both; no clearly marked SR. The beginning of L uncertain, about 5.0; M large, regular, largest on NW
37.	March 26. 14 ^h . Carnian Alps. Weak forerunners; irregular M.
38.	March 27. 8 ^h . Carnian Alps. Weak forerunners, P unsharp. M large, irregular, short and longer periods superposed.

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| 40. | March 29. 5 ^h . Japan. P weak, the reading uncertain. S very large on NW, SS clearly marked; L small. |
| 41. | March 31. 0 ^h . Asia Minor. Strong record. P large on NW, but the beginning small. S large in both diagrams; begins later and unsharp, 38 ^m 13 ^s , on NW; large M group. |
| 45. | April 9. 17 ^h . Peru. $\Delta = c. 97^\circ$. Not very strong record. P faint, PP much stronger; $S_c^p S$ weak, S_n distinct; L regular. |
| 48. | April 14. 9 ^h . Bulgaria. $\Delta = c. 15^\circ$. Very strong record, partly spoiled by bad fixing; S cannot be read with certainty. |
| 52. | April 17. 3 ^h . Mexico. The record partly spoiled by bad smoking. The S-phase quite large. L regular. |
| 54. | April 18. 19 ^h . Bulgaria. Very strong record. The beginning of NW spoiled by bad smoking; in M the zero-position changes. On NE the beginning of P faint, the reading not quite certain; the beginning of S uncertain, perhaps 29 ^m 22 ^s . M large, the pendulum-mass strikes the stop-screws. |
| 63. | April 22. 20 ^h . Corinth. The beginning of P is in the L movement of a preceding earthquake, the reading not quite certain. S clearly marked on NE, where the first forerunner is faint. The beginning of L has long periods; M rather large. |
| 73. | May 2. 21 ^h . Anatolia. P faint on NE, quite large on NW. A short, large M group on NE. |
| 78. | May 14. 22 ^h . Destructive in Northern Peru (Chachapoyas, Jaen) $\Delta = c. 95^\circ$. The beginning of P faint, the reading not quite certain; PP 32 ^m 2 much larger. The S-phase clearly divided; $S_c^p S$ 38 ^m 53 ^s fainter than the following movement; on NE a large oscillation begins clearly 39 ^m 55 ^s , probably S_n ; on NW the largest movement begins about 20 sec. later (another phase?); PS 40 ^m 54 ^s on both. L regular, of long duration; M not large. |
| 87. | May 27. 10 ^h . Japan. iP_{NE} ; PP, a well-defined phase, has about the same amplitude; there are later PR. On NW S begins as a large oscillation 11 ^m 47 ^s ; no corresponding movement on NE, where a large oscillation begins sharply 12 ^m 11 ^s (PS?). SS not clearly marked. L begins earlier, with long periods, on NW. In each diagram a large, short M group, some minutes earlier on NW. |
| 96. | June 1. 13 ^h . Japan. The record not strong. Here as on May 27. the beginning of S not recorded on NE. L earlier on NW. |
| 107. | June 15. 6 ^h . Philippine Islands. $\Delta = c. 90^\circ$. The records partly spoiled by bad smoking. P weak, S rather large, clearly divided. The beginning of L somewhat uncertain, earlier on NW. |
| 109. | June 17. 3 ^h . Mexico. Destructive in Southern Mexico. Epicentre according to Mexico 16° 13' N 97° 11' W. $\Delta = c. 87^\circ$, Very strong record (No NW record). PP 36 ^m 1 strong and larger than P. S_n and PS very strong; S_n preceded by $S_c^p S$ which is weak, with uncertain beginning; may have been read too early. SSS 53 ^m rather big, but the beginning uncertain. L large and regular. |
| 114. | June 21. 16 ^h . Alaska. The beginning disturbed. S clear and large on NE. 1 1/2 min. later on NW an unidentified phase. L regular, not very large. |
| 117. | June 29. 23 ^h . New Hebrides region. The forerunners faint, the phases not clearly marked with the exception of one, marked on NE by a large oscillation, beginning 34 ^m 48 ^s , probably SSS. L regular, not large. |
| 124. | July 15. 9 ^h . Asia Minor. Faint forerunners; P clearer on NW, S on NE. L earlier on NW; M group quite regular. |
| 125. | July 18. 19 ^h . Destructive in Northern Peru (Chachapoyas). $\Delta = c. 95^\circ$. P rather weak; PP distinct, about equally large. $S_c^p S$ clearly marked in both diagrams. On NE S_n a big oscillation with a definite beginning; on NW not very clearly separated from the preceding movement. PS not well defined. L begins rather clearly, with long periods. No marked M group. L regular, of long duration. |
| 134. | Aug. 4. 18 ^h . Destructive in Southern Mexico (Oaxaca) Epicentre according to Mexico 16° 22' N 97° 48' W. $\Delta = c. 87^\circ$. P and PP large on NW, PP larger than P. The S-phase very large on NW; it is the first weak and somewhat uncertain beginning of the phase that has been read; phases not clearly separated in the later, stronger movement. SS marked on NW by a big oscillation. L begins clearly on NW. Large, regular M groups. |
| 151. | Sept. 1. 6 ^h . Hindustani. P weak, S clearly marked on NW; M irregular, not large. |
| 158. | Sept. 18. 17 ^h . Atlantic Ocean. P and S readable on NE only. S has long periods. SSS (or early L?) 45 ^m 3 on NW a large, long-period movement. L regular, the beginning uncertain. |
| 159. | Sept. 18. 20 ^h . Bay of Aden. S is quite large, but the beginning uncertain, owing to some disturbance and the time-mark. L not large, somewhat irregular. |

No.

Notes

161. Sept. 22. 7^h. New Hebrides. $\Delta = c. 135^\circ$. The forerunners rather small and not sharp except 54^m 6^s, presumably $\overline{P_c P_c S}$, on NE. L regular; long-period L waves earlier on NW, M larger on NE.
167. Oct. 9. 3^h. Destructive in Southern Mexico. Epicentre according to Mexico 16° 22' N 97° 48' W (same as on Aug. 4.) $\Delta = c. 87^\circ$. Very strong record. iP_{NW} ; PP 17^m 3 a clear phase, larger than P. The S phase very large, larger on NW; on NW it begins 24^m 42^s ($\overline{S_c P_c S}$?) with a large oscillation; on NE the beginning at 25^m 1^s (S_n ?); at the same time the movement on NW increases. PS 25^m 54^s, SS 30^m 4 are large phases. M large and regular.
172. Oct. 15. 14^h. Balutchistan. P and S large and unusually clearly marked phases. PP 30^m 1 small. L somewhat irregular; two large M groups.
185. Nov. 20. 20^h. Destructive in Antofagasta, North Chile. $\Delta = c. 105^\circ$. In the forerunners there are several distinct phases, but their beginnings are not very clearly marked; those clearest marked may probably be identified as follows: PP $_{NE}$ 53^m 35^s; $\overline{S_c P_c S}$ c. 59^m 8; PS, the strongest phase, 62^m 53^s; SS 68^m 5. L begins with movement of very long period, at c. 81^m; preceded by L-like movement of shorter period, probably due to S reflections; no marked M-phase.
188. Nov. 28. 10^h. Sunda Islands. $\Delta = c. 107^\circ$. The first phase PP 2^m 4^s. PS 11^m 8^s; the movement continues and is probably due also to PPS. SS 17^m 3; SSS 20^m 5. In the first part of L very long periods; no marked M phase.
191. Dec. 1. 4^h. Chile. $\Delta = c. 114^\circ$. Very strong record, many phases. P very faint, possibly 21^m 0; P' faint, about 25^m 0; PP 26^m 0^s strong. $\overline{S_c P_c S}$ 31^m 8; ($\overline{S_c P_c P_c S}$?) 33^m 2; (S_n ?) 33^m 8. The following very strong: PS 35^m 48^s; PPS 36^m 8; SS 42^m 0. The beginning of L uncertain; large, regular M.
194. Dec. 2. 4^h. Chile. $\Delta = c. 114^\circ$. Weak forerunners; PP 40^m 18^s; $\overline{S_c P_c S}$ 45^m 9, PS 50^m 1; SS 56^m 5. Long-period L waves begin earlier on NW, c. 74^m; regular M.
201. Dec. 12. 20^h. N.E. of New Zealand. $\Delta = c. 150^\circ$. The first phase, P', quite distinct on NE; no other clearly marked phases. L regular, not large.
204. Dec. 19. 11^h. Mindanao. $\Delta = c. 98^\circ$. The first forerunners faint; from about 61^m 8 stronger movement, but phases not clearly marked. 65^m 4^s large oscillations, the zero-position changes (disturbance?). On NW a very large M group about 90^m.
205. Dec. 28. 14^h. Mindanao. $\Delta = c. 98^\circ$, $\overline{S_c P_c S}$ 43^m 37^s distinct on NE. No other clearly marked forerunners. M earlier and larger on NW.