

Earthquake Records by Milne Seismograph Meridian Boom. Stonyhurst College Observatory.

Lat. 53° 50' 7" N., Long 2° 28' 2" W., Above Sea, 363 feet.

Time, Greenwich, 0 or 24 = Midnight. *Subsoil. Muirstone Pit.* Abbreviations on the other side.

Date	P ₁		P ₂		P ₃		Maximum		2A	End		Boom Deviation, 1 mm = 228" arc Boom Period = 180 sec. Pillar Inclination 1 mm = 440" arc
	H.	M.	H.	M.	H.	M.	H.	M.	mm	H.	M.	
1921												
Jan	January											
2	7.	28.8					7.	58		8.	45	Small
"	9.	39.4								11.	18	"
6	23.	51.2								24.	6	Very small
7	2.	21.5					2.	34.0	0.5	3.	3	
"	3.	41.2					4.	30.5	1.2	5.	9	
"	10.	22.2					10.	28.5	0.7	10.	42	
9	13.	39.5					13.	47.5	1.2	14.	34	In. masked by wind tremors.
"												
19	15.	16.0					15.	51	0.7	17.	0	
"	18.	47.5								19.	11	Small
20	21.	30.0								22.	18	Very small.
Feb.	February											
4	8.	34.8	8.	44.4	8.	59.5	9.	10.9	6.1	11.	40	$\Delta = 75^\circ$ (Pinnacly).
6	4.	58.4					5.	12.5	0.5			
"							5.	21.0	0.5	5.	53	
10	18.	23.0										Very small
"	20.	26.0										Very small
"	20.	56.0					21.	9.0	0.7	22.	5	
11	0.	19.5	0.	26.5			1.	6.5	0.7	2.	29	
14	1.	35.5					2.	2.0	2.5			
"							2.	8.5	0.6	2.	37	
19	14.	52.5					15.	49.5	0.9	17.	7	
"	18.	35.3	18.	45.5	19.	16.5	19.	32.0	1.5	21.	16	
21.	Several very small disturbances between 12 ^h or 16 ^h .											
"	16.	26.2	16.	28.5	16.	33.0	16.	33.3	1.0			
"							16.	37.0	0.9	17.	16	
"	17.	42.0										Very small.
"	19.	53.4					20.	3.0	0.5	20.	19	
27.	Light foaled 2 ^h to 11 ^h 30 ^m											
"	18.	43.5	18.	52.9	19.	15?						$\Delta = 75^\circ$
"			(19.	5.4)?			(19.	7.0)	(2.0)			apparently a second shock.
"							19.	43.5	2.0			
"							19.	46.8	4.2			
"							19.	48.7	2.0			
"							19.	51.4	4.0			
"							19.	53.5	4.1			
"							20.	12.7	3.0			
"							20.	15.6	5.7			
"							20.	18.5	6.5			
"							20.	22.5	3.4			
"							20.	35.3	2.4			
"							20.	43.2	1.9	22.	44	

J. Rowland S. J.
Observer.

ABBREVIATIONS.

$P_1 P_2 P_3$ = 1st, 2nd and 3rd phases (arrivals).

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Date	P ₁		P ₂		P ₃		Maximum		2A	End		Boom Deviation, 1 mm = 22" arc Boom Period = 18.0 sec. Pillar Inclination 1 mm = .440" arc
	H.	M.	H.	M.	H.	M.	H.	M.	mm	H.	M.	
1921												
Mar												March
3	3.	19.30	3.	25.5	3.	45.5	3.	57.0	1.8		5.	45
"	8.	49.70	8.	58.0	9.	25.7	9.	37.5	1.0		10.	48
5	6.	48.5	In				7.	24.0	0.5		8.	7
6	7.	47.5	In				8.	12.5	1.6		8.	58
10	19.	45.5	In								24.	50
15							20.	33.0	0.5			
	Small tremors throughout 15 th or 16 th .											
19	9.	2	In				9.	15	0.7		9.	45
23	23.	2	In				23.	53.5	0.3			
24							0.	3	0.4			
"							2.	34	0.3		12.	7
"	9.	21.5	In				10.	56	0.8		12.	54
28	8.	11.0		8.	10.7	8.	15.5	8.	37.2	4.2	12.	0
29	22.	33.8	In				23.	3	0.5		1.	0
30	10.	57.5	In				11.	21	0.5			
"	15.	16.9					16.	7.5	1.0			
							16.	13.5	1.0			
							16.	17.0	1.0			
							17.	21.0	0.8		17.	57
Apr.												April.
1	4.	25.50					5.	40	2.0		7.	3
2	9.	53.50			10.	25.5	10.	32	4.1		13.	7
22	6.	57.70	7.	61	7.	57.1	8.	0	0.8			
							8.	13.5	0.8			
							8.	20	0.8		9.	2
25	18.	45.0	18.	53.8	19.	5	19.	57	0.8		20.	1
	Issued May 6, 1921.											
	Howard S. J. <u>Seaver.</u>											

Δ = 75"

P₂ lost in local disturbance
Phase very ill defined.

ABBREVIATIONS.

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Date	P ₁		P ₂		P ₃		Maximum		2A	End		Boom Deviation, 1 mm = 220" arc Boom Period = 180 sec. Pillar Inclination 1 mm = 440" arc	
	H.	M.	H.	M.	H.	M.	H.	M.	mm	H.	M.		
1921													
May												May	
7	5	57.5	6	2.4	6	26.0	0	25.5	3.2		8.27		
12	4	2.5 e					5	5.5	0.8		6.27		
14							13	29.5	0.9		15.40	Unusual event lost during change.	
"	21	43.5 e					22	50.0	1.0				
"							23	57.0	1.0		24.42		
			16 th - 17 th No record.										
17	23	57.0 e					24	21.5	0.6		24.51		
20	0	22.2	0	27.2	1	3.6	1	5.0	1.5		2.14	Change P. doubtful. End during	
21	9	65.?					9	47.5	2.0		7.20		
"	22	47.5 In					23	21.5	1.2		1.14		
28	19	59 In e					21	33	0.6		22.14		
June												June	
5	19	22.9 In									22.5	Very Small	
14	1	56.3 In										"	
28	14	19.2 In e					14	46	0.5				
"							14	57	0.5				
"							15	35.5	0.5				
"							15	40	0.5				
"							5	55.5	0.3		16.21		
29	23	29.5 In e					23	53.5?				Very Small	
30	2	14.5 In e					2	20.5	1.1		2.44		
July												July	
6	14	41.3 In e									15.57	Small	
7	11	23 In					11	41	0.9		13.20		
11	16	15 In									16.46	Small, Probably local	
12	13	21 In										very small	
15	18	25 In e					18	36			21.48	" "	
16	15	40.3 In e											
"	15	47.0 In e									16.8	small, doubtful	
18	17	33.0 e					17	56	1.0		18.16		
25	14	17 In										very small	
"	16	25 In e									16.21	" "	
"	19	47.3 In e					20	19	1.0				
"							21	50	0.3		22.19		
29	1	38 In e					1	49	0.5		2.55		
31	11	1 In e					11	26	0.7		12.18		

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	H.	M.	H.	M.	H.	M.	H.	M.	mm	H.	M.		
1921													
May												May	
7	5	57.5	6	2.4	6	26.0	0	28.5	3.2	8	27		
12	4	25					5	5.5	0.8	6	27		
14							13	27.5	0.9	15	40	Commencement lost during change.	
"	21	43.5					22	50.0	1.0				
"							23	57.0	1.0	24	42		
			16 th - 17 th No record										
17	23	57.0					24	21.5	0.6	24	51		
20	0	52.2	0	57.2	1	3.6	1	5.0	1.5	2	14	Change I, doubtful. End during	
21	9	6.5					9	47.5	2.0	10	20		
"	22	47.5					23	21.5	1.2	1	14		
28	19	59					21	33	0.6	22	14		
June												June	
5	19	22.9								20	5	Very Small	
14	1	56.3										"	
28	14	19.2					14	46	0.5				
"							14	51	0.5				
"							18	55.5	0.5				
"							15	46	0.5				
"							2	55.5	0.8	16	21		
29	23	29.5					23	55.3				Very Small	
30	2	14.5					2	20.8	1.1	2	44		
July												July	
4	14	41.5								15	57	Small	
7	11	28					11	41	0.9	13	20		
11	16	15								16	46	Small, Probably local	
12	13	21										Very Small	
15	18	25					18	36		21	48	" "	
16	15	40.3											
"	15	47								16	8	Small, doubtful	
18	17	33.0					17	56	1.0	18	16		
25	14	17										Very Small	
"	16	25								16	21	" "	
"	19	47.3					20	19	1.0				
"							21	50	0.3	22	19		
29	1	38					1	49	0.5	2	55		
31	11	1					11	26	0.7	12	18		

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Date	P ₁		P ₂		P ₃		Maximum		2 A mm	End		Boom Deviation, 1 mm = 22" arc Boom Period = 18.1 sec. Pillar Inclination 1 mm = 44" arc
	H.	M.	H.	M.	H.	M.	H.	M.		H.	M.	
1921												
Aug	August											
4	3.51										1.12	very small
10	14.15	14.19	14.19	14.20	14.20	14.25	0.8			14.46		Disturbed by seismic.
14	13.28	13.31	13.31	13.40	13.40	13.47	0.9			13.56		Phases ill defined.
15	15.24									17.45		Very small.
21	1.30											" "
23	5.16					5.22	0.5			5.31		
	20.21				20.22	20.47	10.4			22.17		
31	21.57									22.54		small
Sept.	September											
5	20.37											No definite phases
"	20.18											
"	20.23											
"	20.28					20.31	0.5					
"						20.40	1.0					
"						20.44	1.1					
"						20.50	1.2					
"						21.3	2.0					
"						21.7	1.1			22.3		
11	4.21					5.40	7.0			14.55		It large earthquake of which our record is almost illegible owing to partial failure of light.
12-13	No record.											
19	4.28					5.0	0.5			6.48		
"	23.23											
"	23.58											no clear phases.
20						3.47	1.0					
"						1.18	1.0			2.12		
21						11.34	0.8			13.58		Earlier Phases lost.
23	11.38									15.42		Continuous, small
	Disturbances of somewhat irregular and unusual character.											
27	17.8					17.10	0.5			17.55		
29	15.30					14.2	0.5			15.20		

Issued Oct 14th 1921

Howland Sp.
Observer

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Subsidiary Millstone, Brit.

Abbreviations on the other side.

Date	P ₁		P ₂		P ₃		Maximum		2 A	End		Boom Deviation, 1 mm = $\frac{22}{7}$ arc
	H.	M.	H.	M.	H.	M.	H.	M.	mm	H.	M.	Boom Period = 18.0 sec.
1921												Pillar Inclination 1 mm = $\frac{4}{7}$ arc
Aug												August,
9	0.	51 ²									1. 12	very small
10	14.	15.3 ^e	14.	19.2	14.	20.5	14.	25	0.8		14. 46	Doubtful if seismic.
14	13.	26.5 ^e	13.	31.8	13.	45.5	13.	47.5	0.9		15. 16	Phases ill-defined.
15	15.	29.5 ^e									17. 45	Very small.
21	1.	30 ^{In}										" "
23	5.	16.2 ^{In}					5.	22.5	0.5		5. 51	
"	20.	21.3 ^e			20.	24.2 ^e	20.	27.0	10.4		22. 17	
31	21.	39.5 ^e									21. 59	Small
Sept.												September,
5	20.	13.7 ^{In}										No definite phases
"	20.	18.7										
"	20.	23.8										
"	20.	28.0					20.	31	0.5			
"							20.	40	1.0			
"							20.	44	1.1			
"							20.	50	1.4			
"							21.	3	0.9			
"							21.	7	1.0		22. 3	
11	4.	21 ^{In}					5.	16.0	7.0		14. 53	A large earthquake of which our record is almost illegible owing to partial failure of light.
12-13												No Record.
19	4.	28.0 ^{In}					5.	0	0.5		6. 48	
"	23.	23 ^{In}										No clear Phases.
"	23.	58.5 ^e										
20							0.	47	1.0			
"							1.	18.5	1.0		2. 14	
21							11.	34	0.8		13. 58	Earlier Phases lost.
23.	11.	38 ^{In}									15. 42	Continuous small disturbances of somewhat irregular and unusual character.
27	17.	8 ^{In}					17.	10.5	0.5		17. 55	
29	13.	30.5 ^{In}					14.	2	0.5		15. 20.	

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