

1914
1915

1914 No. 12
1915 No. 1

Jesuit Seismological Service

RECORD

OF THE

Earthquake Station, Sacred Heart College

DENVER, COLO., U. S. A.



ALTITUDE: 1655 M.
 LONGITUDE. 104° 56' 54" W. Gr. LATITUDE: 39° 40' 36" N.
 TIME: Mean Greenwich, midnight to midnight.
 INSTRUMENT: Wiechert 80 Kg., astatic, horizontal pendulum.
 NOMENCLATURE: International.

FROM December 1st, 1914. To January 31st, 1915.

DATE	CHAR.	PHASE	TIME			PERIOD	AMPLITUDE		REMARKS
							AN	AE	
			h.	m.	s.	s.			
Dec 1914									
10			3	20					Apparent wavelets and tremors. Thickening of pen marks.
			5	40					
18									Activity, irregular wavelets especially on E-W.
19									Activity. Irregular records and thickening of pen marks especially on E-W.
25									Quake reported from Washington D.C. No record here.
Jan 1915									
8			13						Activity here. Thickening of pen marks. Wind was high.
			15	30					
11			5	30					Quake reported from La Barbara, Cal. Possibly slight record at his mark
			6	0					
13									Great Italian quake. Recorded in Georgetown from 2:23 to 2:32, eastern time. Here no record of it at all. But the whole blank has evident marks of activity. This lasted the whole night.
18									Quake reported from Somerville, Oregon. No record of it here.
19									Quake reported from Cozenza, Calabria. No record of it here.
21									Panama quake reported. No record on our blank.
28			5						Activity, thickening of pen marks
			7						

A. W. Forrestall Jr.

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FROM Feb 1st

TO Feb. 28th

DATE	CHAR.	PHASE	TIME			PERIOD	AMPLITUDE		REMARKS
			h.	m.	s.		AN	AE	
4			16	13					Long period very weak waves activity during day. Rather doubtful.
5									Quake reported from Chicago & Illinois. Could not ascertain the exact time.
9			16						Disturbance on E-W but very irregular & somewhat doubtful.
			19	ends					
10									Quake reported from Carhuayanchachs Defacto Lima, Peru. No visible trace on our blanks.
13			2						Activity at two marks but doubtful. Heavy machinery in motion nearby.
			4	ends					
14			10						Possibly activity.
			11	ends					
15									Quake reported from central ^{part of} Italy. No record here.
20									Quake reported from Merrimac Valley & Lawrence Mass - Indication of it seen on blanks but hardly visible.
22			12						Very small waves long period - Both comp.
			14	ends					
25			1						Long period waves on E-W
			3	ends					
28			7						Long period waves, very weak especially on N-S.

B. W. Foxhall Jr.

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FROM March 1st TO March 30th

DATE	CHAR.	PHASE	TIME			PERIOD	AMPLITUDE		REMARKS
							AN	AE	
			h.	m.	s.	s.	μ	μ	
1 st			7	51					Minor quakes at Grand Junction Colo. Grand Valley - Very slight tremors recorded
			7	52					
3 rd			9	59					Slight sinusoidal curve but not regular
			10	0					
4 th									Minor shocks reported from Tuscany Italy - Felt in Rome & Pisa
5 th			23	59					Very small waves but irregular especially on N-S. and recurring several times during day
			24	6					
6 th									activity. Thickening of pen-marks somewhat doubtful. Possibly connected with quakes reported from Abruzzi Provinces - Italy
13			18	39					Very strange record of broken waves especially strong on N-S.
			18	45					Reappearance of same. Not caused by any motion in building, I think.
			18	54					
			19	0					
24									activity. Thickening of pen-marks at times during day -
27									Slight quakes in Province of Perugia Italy - no record here

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FROM April 1st TO April 30th

DATE	CHAR.	PHASE	TIME			PERIOD	AMPLITUDE		REMARKS
			h.	m.	s.		AN	AE	
6									Inaly reported from Aluzzi Province Italy - no record here
15			19	56					Activity especially on E-W. & also later during day
19			18	26					Activity on E-W. Irregular & choppy waves - nothing on N-S.
			2	2					From 2:2 to 2:4 wavelets on E-W.
20			17	27					3 or 4 wavelets, long period ends at 17:29 - on E-W.
			19	2					Long period wavelets - Broken but not on E-W & N-S. This occurs again during day but on N-S.
24			18	30					Long period waves on E-W. ends at 19. -
			1	29					Wavelets appear on E-W - ends at 1:42. Nothing on N-S. This was probably another minor quake.

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FROM May 1st TO May 25th

DATE	CHAR.	PHASE	TIME			PERIOD	AMPLITUDE		REMARKS
							AN	AE	
			h.	m.	s.	s.	μ	μ	
1	a.f.	P _n	?						Good record but prelim. not to be seen. Said to have been in Japan but not confirmed
		P _f	?						
		L _n	5	31		40	7.2		
		L _f	5	31		35		5.5	
		M _n	5	34		40	9.3		
		M _f	5	33		35		8.	
		P _n	5	40		20?			
		P _f	5	39		20?			
		F _n	6	8					
		F _f	5	55					
4			21	54					Activity on E-W. Nothing on N-S.
			22	ends					
8			18	20					Long slender waves on both comp. especially on E-W
			19	ends					
12			20	25					Activity on E-W.
			20	36 ends					
			18	22					Activity on E-W.
			18	34 ends					
13			20						Activity on E-W.
			20	10 ends					
14			18	35					Activity on E-W. Visible all day
			18	39					
22			21	28					Broken, irregular waves E-W
			21	34					Possibly M _E Lassen Cal. eruptions.
25									Quake reported from Alaska, Cooks Inlet - not confirmed. No record here - only doubtful indications

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FROM JUNE 1ST To JUNE 22ND

DATE	CHAR.	PHASE	TIME			PER. s.	AMPL.		△	REMARKS
			h.	m.	s.		An.	Ae.		
			μ	μ						
3			7	57					Very small waves on E-W. Thickening of penmarks on N-S.	
			8	3						
4			15	32					Small oscillations on top of record of heavy machinery in motion near by.	
			15	51						
5			2						Very small, yet distinct, wavelets on N-S.	
			3	30						
6	I.e.r.	Le	21	48					Just visible on E-W. Very broken and irregular on N-S.	
		Me	21	49						
		Fe	21	52						
18			14	30				Quake reported from Los Angeles, Cal. No sure record here.		
22	II.i.	Pn	4		30				First quake from Imperial Valley, San Diego, Cal-exico, Cal. Record on N-S is good. Hardly any record on E-W. Preliminaries very doubtful.	
		Pe	?	?	?					
		Sn								
		Se								
		Ln	4	3		6				
		Le	4	3						
		Mn	4	3	50	6	62.5			
		Me	?	?	?			1.8		
		Cn	4	5		4-5				
		Ce	4	5	?					
		Fn	4	8	?					
Fe	4	8	?							

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FROM JUNE 22ND TO JUNE 30TH

DATE	CHAR.	PHASE	TIME			PER. s.	AMPL.		△	REMARKS
			h.	m.	s.		An.	Ac.		
22	II.i.	Pn								Second quake from Imperial Valley, entirely distinct from preceding. No prelimin. can be seen on either component. Hardly any record on E-W. Record on N-S is very good.
		Pe								
		Sn								
		Se								
		Ln	5		30 ?					
		Le	5		30 ?					
		Mn	5		30 ?	12	87.5			
		Me	5		30 ?	10		37		
		Cn	5	3						
		Ce	5	3						
		Fn	5	6						
		Fe	5	6						
24			10	30					Very long period waves on N-S. Nothing on E-W.	
			11	32						

A. W. Herstatt S. J.

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NOMENCLATURE: International

FROM JULY 1st To JULY 31st

DATE	CHAR.	PHASE	TIME			PER. s.	AMPL.		△	REMARKS
			h.	m.	s.		An. r	Ac. r		
1-2			15							Constant activity at intervals on N-S. Only thickening of penmark on E-W. Waves are irregular and broken. E-W pen hindered by undue friction.
3-4			15							Same as above, but activity stronger, intervals closer. E-W pen not yet free from friction.
4-5			15							Same as above, but activity lessens. Possibly activity of last 3 days due to eruptions of Mount Yagekatake, near Matsumoto, Japan.
16			3							Visible activity on both comp., especially on E-W.
21			9							Small but distinct oscillations at intervals on N-S. Weaker on E-W.
30	I.u.e.	Pn.	1	49						Disturbed through min. mark. Second prelim. not visible. Reported by Georgetown Univ., D. C., and Cleveland. Sinusoidal.
		Ln.	2	1						
		Mn.	2	3	20	6.2				It was found that E-W pen of instrument was hindered by friction since latter part of June.
		Cn.	2	5						
		Fn.	2	7						
31			11	48						Wavelets seen on N-S.
			12	4						

A. W. Forcell

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FROM AUGUST 1st To AUGUST 31st

DATE	CHAR.	PHASE	TIME			PER. s.	AMPL.		△	REMARKS
			h.	m.	s.		An. μ	Ac. μ		
1	I. u.	e Fn	10	15					Irregular waves on N-S. E-W pen now free from friction.	
2		e Fn	8	5					Wavelets at intervals between hrs. marked.	
5		e Fe	21	2					Very irregular waves.	
9	I. u.	e Fn	17	20					Very small sinusoidal.	
"	I. u.	e Pn Mn Fn	20	6	15					
10	I. u.	e Fn	10	50					Very small sinusoidal. Irregular on E-W—	
12	I. u.	e Fn	10	0					Sinusoidal at intervals. Long period, very small ampl. Eruptions on Suwasejima Island, Japan.	
18	I. u.	e Fn	13	4					Quake reported from South British Columbia.	
"	I. u.	e Fn	13	24	26				Thickening of penmarks on E-W.	
20	I. u.	e Fn	7	0	20-35	5-7			Almost continual activity, but especially on N-S at hrs. marked. Very long periods.	
25		e F	16	0	20-30	2-4			Almost constant activity on both comp. Long period.	
27		e Fn	12	20	10-15				Very small sinus. at intervals on N-S. Irregular on E-W.	
29		e Fe	11	20					Long period waves at frequent intervals. Less discernible on N-S.	
31		e Fn	12	40					Irregular, long period waves on N-S. Less visible on E-W.	

A. W. FORSTALL, S. J., Director.

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FROM SEPTEMBER 1ST TO SEPTEMBER 30TH

DATE	CHAR.	PHASE	TIME			PER.	AMPL.		△	REMARKS
			h.	m.	s.		An.	Ae.		
3	r.	e Pn	7	52						Nothing on E-W. Recurrence of wavelets on N-S. at times.
		Ln	7	56						
		Fn	7	59						
5		e	13	36						Only thickening of penmarks on N-S.—
		Me	13	38						
		Fe	13	40						
7	e. v.	Pn	1	26						2nd prelim. doubtful owing to creases in and overlapping of paper.— From 1-33 on, all the waves are quite broken and irregular.—
		Pe	1	26						
		Sn	1	30						
		Se	1	30						
		Ln	1	32	10	69				
		Le	1	31	10		68			
		Mn	1	33	10-12	143				
		Me	1	35	10-12		143			
		Cn	1	46	10-15	25				
		Ce	1	46	10-15		25			
		Fn	2	17	10-20					
Fe	2	27	10-20							
13					4 ?				Visible activity on E-W.	
16-17										Small Sinus. frequent on N-S. irregular on E-W.—
19										Stromboli, Aetna, Vesuvius become active— Tremors felt in Italy—no record here.—
23										Quake reported from Rome. Only doubtful indications here.
25-26										Visible activity on both comp. Sinusoid. on E-W.—Thickening of penmarks on N-S.
27		e Ln	6	57		20-30				Very discernible Sinus. often recurring on N-S.
		Fn	6	59						

A. W. FORSTALL, S. J., Director.
 O. L. ABELL, S. J., Assistant.

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FROM NOV OCTOBER 1ST To OCTOBER 31ST

DATE	CHAR.	PHASE	TIME			PER. s.	AMPL.		△	REMARKS
			h.	m.	s.		An. μ	Ac. μ		
1										Quake reported from Calif. only doubtful indications here.
2	I.v.i.	Pe	23	42						Prelim. not discernible on N-S.— Calif.-Nevada quake.
		Se	23	44						
		Me	23	45		8	25			
		Mn	23	45		8	25			
		Fe	23	50						
		Fn	23	49						
3	I.v.i.	Me	1	53		15-20		35		Prelim. not discernible.— Calif.-Nevada quake.
		Mn	1	53		1-4	68			
		Ce	1	56						
		Cn	1	56						
		Fe	2	3						
		Fn	2	3						
3	III.v.i.	Le	6	56		10-12		112		Calif.-Nevada quake. Prelim. not discernible.—Periods of Mn and Me doubtful owing to pens jumping off the paper.—Amplitudes of Mn and Me also doubtful owing to safety stop.—Hence real amplitudes were probably larger.
		Ln	6	56	30	10-12	62			
		Me	6	57	30	8-12		687		
		Mn	6	58		8-12	537			
		Ce	7	19			8			
		Cn	7	19			8			
		Fe	7	48						
		Fn	7	48						
7	I.d.e.								Very small sinusoid. at times.	
11									Quakes reported from S. Juan, P. R. and Stuttgart, Germ. No indications here.	
12									Quake reported from Reggio, Italy.— No record here.	
23									Intermittent activity on E-W.	

A. W. FORSTALL, S. J., Director
 O. L. ABELL, S. J. Assistant

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DATE	CHAR.	PHASE	TIME			PER. s.	AMPL.		Δ	REMARKS
			h.	m.	s.		An.	Ac.		
1										Quake reported in Japan by observatory of Scotland.
10		Le	8							At times sinusoidal, at times broken waves on E-W.
		Fe	12							
11-12										Intermittent activity on both components.
14-15										Activity on both components—Coincides with incipient activity of Stromboli.
21		Pn	0	10						Imperial valley quake—clock was under repair.
		Pe	0	10						Time of beginning somewhat doubtful. 1st and 2nd prelim. hardly discernible. Ln appear abruptly.
		Sn	0	12						On E-W., Ce appear rather suddenly. On N-S, Mn pass very gradually into Cn.
		Se	0	12						
		Ln	0	13	10-12	573				
		Le	0	13	8-10		570			
		Mn	0	14	10-12	650				
		Le	0	14	10-12		837			
		Cn	0	17	7-8	175				
		Ce	0	16	8-9		137			
		Fn	0	32						
		Fe	0	36						
21										According to residents of Calxico, Imperial valley quake was preceded by eruption of volcano in Cocopah mountains.
29-30										Intermittent activity on both components.

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			h.	m.	s.		Am.	Ac.		
2		Ln Fn	15 18						Activity on both components especially on N-S.	
7									Quakes reported from Cairo, Ill. 12:45 l. t. From Memphis, Tenn. 12:40 l. t. From Jonasboro, Ark.—	
11	I. i. e.	Le Fe	12 12 12 17						Small distinct waves.	
11		Le Fe	12 31 12 36						Reappearance of small waves.	
11	I. r. e.	Le Me Ce Fe	15 1 15 13 15 28 15 31		7-8		6-8		Very small waves—Distinct however— Regular. N-S. component disturbed by machinery in motion.	
15	I. r. e.	Ln Fe	8 14		25-40				Very distinct waves, long period on N-S. Indistinct on E-W.	
29-30	I. r. e.	Ln Le			20-24		6-9		Very striking activity all day. Waves were distinct and regular on N-S.	
31	II. r. i.	Le Ln Me Mn Fe Fn	12 27 12 27 12 30 12 28 12 34 12 37			10 10	18 18		Preliminaries not discernible. Waves much clearer on N-S.	

A. W. FORSTALL, S. J.,
Director

O. L. ABELL, S. J.,
Assistant