HARVARD UNIVERSITY, CAMBRIDGE, MASS., U.S.A.

RECORD OF THE SEISMOGRAPHIC STATION

DEPARTMENT OF GEOLOGY AND GEOGRAPHY

$\phi = 42° 22' 36''$ N. $\lambda = 71° 06' 59''$ W. Gr. $h = 5.367$ M. FOUNDATION: Glacial sand over clay.

TIME: Mean Greenwich, midnight to midnight.

INSTRUMENTS: Two Bosch-Omori 100 kg. horizontal pendulums (mechanical registration).

No.	Date	Phase	Time	Periods	Amplitudes	Δ	REMARKS
			h. m. s.	s.	μ.	Kms.	
	1921 Jan 2	O	7 postea				Very distant. N gives microseisms of 6 secs. period only.
		L_E	7 51 40	20			
		L_N	7 59 42	20			
		E?	8 25 ca.				
	Jan 8	O	6 postea				Record masked by microseisms.
		L?N	6 49 46				
		L_E	6 55 07				
		E?	7 ca.				
	Jan 9	O	12 postea				Cf. Ottawa O: 12 55 07. Records much masked by microseisms; and E too heavily damped.
		L_E	13 28 03	20			
		E?	13 29.5				
	Jan 19	L?E to	15 48 ca 16 03				Obscure record of distant L waves amid microseisms on E component only.

Note: The north-south component of the Bosch-Omori seismometer has not given satisfactory records for some time. During the month of January 1921, the magnetic damping device on the EW component was put too close to the pendulum to permit the registration of the weak seismic action of the month. J. B. Woodworth

Mimeographed and Issued February 21,1921.

J. B. Woodworth.

(For explanation of Symbols see other side)

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M^1, M^2, M^3, etc. ...Successive maxima.
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	1921						
	feb. 1	O	8 22 17			5585	32½°. Distance & O mean. of N&E records. Probably earthquake reported as destructive in Tehauntepec, Mexico. Distance from station to λ95°W,, φ17°N.= 3620 kms. by haversine cos. formula.
		iP	8 28 00				
		eP	8 29 03				
		i	8 29 24				
		iN	8 29 30				
		iN	8 30 22				
		SN	8 34 12				
		S	8 34 39				
		iN	8 35 08	11			
		iN	8 35 44	24			
		e	8 36 34	25			
		e N	8 37 ca		trace		
		M	8 39 39	7	4500		
		M	8 41	8	9125		
		M	8 42 15	8	8500		
		M	8 44	8	10000		
		C	8 50				
		F	9 37				
	Feb 6	O?	4 poste			?	Distance 5325 kms.? ? Pendulum sets west. No trace on N
		S ?	5 10 ca	6			
		e	5 12 52	10			
		e	5 14 57	14			
		eL	5 17 33	16			
		C?	5 21 19				Scant traces after C.
		F?	5 24 ca.				
	Feb 6	L?	21 21 ca.	vari			Possibly non-seismic; masked by microseisms.
		to	21 31 ca.	able			
	Feb 11	O?	0 11 07			8500?	P lost in microseisms; S uncertain; and time interpolated. Minute tick failed between 16h 45m on 10d and 17h 15m on 11d. No record on N. F in microseisms.
		S?	0 32 39	8			
		L	0 47 11	26			
		L	0 57 35	20			
		C	1 07 37	16			
		C	1 12.0	16			
		to	1 19 20				
	Feb 11	O?	22 37 23			4945?	P in microseisms. S may come later. N component failed to register this earthquake.
		S?	22 52 26	8			
		e	22 55 48	8			
		eL	22 59 04	20			
		to	23 01 36				
		L	23 02 31	16	and 20		
		C	23 04 40	8			
		F?	23 06 40				

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			h. m. s.	s.	μ.	Kms.	
	1921						
	Feb 19	e_E?	15 41 44	10			Began and ended in pulsations of doubtful appearances.
		L	15 45 24	22			
		L	15 47 40	20			
		F	16 postea				
	Feb 19	0?	(18 24 20)				
		e_E	18 37 26	10	Trace measure ments	11,100?	0 from Strassburg, and Harvard distance from Strassburg 0 and Harvard eL. i_N 18 37 20 indicates distance over 11,200 kms.
		i_E	18 56 04				
		eL_E	19 13.0				
		L	19 16 00	28			
		L	19 16 22	20			
		F	20 30 ca.				
	Feb 21	0	15 postea				Difficult to diagnose into phases. Microseisms mask both N and E records.
		e_E	16 03 54	2			
		e	16 05 14	3			
		i	16 10 10	6			
		i	16 10 54	6			
			16 11 28	7			
		L_E	16 15 07	9			
		L	16 17 02	11			
		M	16 17 58	14			
		L	16 40 18	8			
		to	16 42 29				
		F?	17 10 ca.				
	Feb 21	0	19 postea				Exhibits general vague character of preceding record; e and F in microseisms.
		S_E?	19 45 44	16			
		M_E	19 48 42	11	1500		
		F?	20 02 ca				
	Feb 27	0?	18 30 55			8420?	Probably futher away. N and E records are inconsistant with each other Cf. Tucson 8680kms; 0:18 23 39; with Osaka 8090kms; 0: 19sic 23 24; intersecting east of Tonga Id. ca. 167°W. 18°S. Strassburg about 9400kms; 0:18 30 47; Ottawa 8780kms; 0:18 29 56. Maximum A in group.
		eP_E	18 42 38n	6			
		e	18 43 08	7			
		S_E	18 52 19				
		i_E	18 52 28				
		S_R	18 59 01				
		L_N?	19 08 32	50?			
		L_E	19 15 08	50			
		L_E	19 17 52	28			
		eM_E	19 23		6000		
		to	19 30				
		eM_E	19 31		8350		
		to	19 33				
		eM_E	19 36		7000		
		to	19 37				
		Lrep	20 35.0				
		F	21 40				

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	Mch 2	eL_E	3 32 35	28			Distant possible eS_E?
		L	3 54 37	20			at 3h 26,6m; but isolated
		L	4 02 ca.	15			from eL. F lost in pulsa-
		F?	4 26 ca.				tions (not microseisms).
	Mch 3	O?	8 36 09			11,420?	102?8 of arc.
		iS_E?	9 02 16	8			S? isolated from eL.
		eL_E	9 26 20	40			
		L	9 31 09	30			
		eM_E?	9 38 28	20			Flat waves, but having
		L	9 41 ca	20			max in the record.
		L	9 54 22	20	cresc.		
		F?	10 40 ca.				F lost in pulsations of irregular periods.
	Mch 6	O	7 24 52			3970	eL and S somewhat in
		P_E	7 32 08	2			doubt as to fixation. L-P
		S_E	7 37 55	8			indicates distance about
		eL_E?	7 43 00	32			4200 Kms. E damped 1.5/1 by
		L_E	7 44 11				magnet. N undamped gives
		M_E	7 47 40		15mmtr		poor record. F_N 13 56 10.
		L_E	9 05 13	16			
	Mch 12	O	0 postea				Forephases too uncertain
		P_{RE}?	10 04.5				for use.
		S_E?	10 30 42	8			
		i_E	10 32 28	14			
		eL_E	10 46.0	28			
		L	10 48 42	23			
		F	11 44.2				
	Mch 24	O	4 postea				Steady-mass jerked West.
		e_E?	5 08 24				
		e_E	5 13 38	7			S may appear earlier.
		eL_E	5 24 38	16			F lost in pulsations
		L	5 40 ca.	12			characterising early day-
		F?	5 55 ca.				light hrs. since Feb. 14th.

N.B. Component N in commission, but not registering well because of friction in indicator. Component E not running between 15h 43m March 18, and 13h 40m March 19; again between 10h 00m and 13h 43m on March 20; again E stopt between 2h 57m and 12h 51m March 21.

Mch24	O?	14 44 57			6220?	56°? of arc. N gives
	$e=S?_E$	15 02 29	10			M 15h 30m ca. undamped. Scragg-
	i_E	15 03 33	11			ly record, difficult to diag
	i_E	15 08 39	11			nose.
	eL_E?	15 20 08	40			Shorter periods on eL.
	iL_E	15 24 04	20	Trace		
	M_E	15 25 36	18	1000		6 similar waves.
	M_E	15 28 42	22	1000		
	C_E	15 39 ca.	15			
	F?	16 35 ca.				

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	1921						
	Mch 25	O?	0 31 26	∅		7590?	68.2°? of arc.
		$eP?_N$	0 51 01	3			
		$eP?_E$	0 51 18				
		$iS?_N$	0 51 25	4			
		i_E	0 51 30	4			
		M_N	0 52 23	14	16,300		Max.or S_R strongly reflected.
		eL_N	1 64 43	20			
		L_E	1 05.0				
		L_N	1 07 35	16			
		L_E	1 07 58	15			
		$F_N?$	1 46 ca.				
	Mch 28	O	7 49 15			3490	31.4° of arc
		P_{NE}	7 55 55	2			
		iP_E	7 55 57	10			
		i_E	7 57 04	8		2500	
		i_N	7 57 11	10			Very large amplitudes
		i_E	7 58 49	10			
		iS_N	8 01 11	11			
		iS_E	8 01 12	10			
		L_{NE}	8 05 01	24			eL not very distinct.
		L_N	8 05 14	41			
		in_E	8 05 07	6			Another earthquake interfering with L waves. Period of undamped pendulum
		L_E	8 05 23	33			
		M_N	8 08 05	23			
		M_W	8 07 50				
		M_W	8 08 17				
		M_W	8 09 02				
		M_W	8 10 07				
		M_W	8 10 46				
		M_W	8 11 13				
		L_E	8 16 38				Section of much smaller A running to C.
		C_E	8 22 40				
		F_E	10 08				
	Mch 29	$S_E?$	22 56 38	6			No trace on N.and e and F obscured by pulsations
		$eL_E?$	22 03.0				
		L	23 04 17	20			
		C?	23 11 ca.				
	Mch 30	L?	16 to 12h				Irregular period pulsations Possibly non-seismic.
		L?	16 18 ca				
		to	16 20 ca.				
		L?	16 22 ca.				
		to	16 24 ca.				

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Measurements in the Metric System.

kms. .....Kilometers (1000 kms. = 621.38 English statute miles. 111.1 kms. = 1°).
M or m.....meter (s). (1 m. = 3.28083 feet.)
mm. .....Millimeters (1 mm. = 0.03937 in.).
μ.....Micron, 1/1000th of a millimeter = 0.00003937 in.

BIBLIOGRAPHY

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No. April 1,1921 From April 7,1921 to 192

HARVARD UNIVERSITY, CAMBRIDGE, MASS., U.S.A.

RECORD OF THE SEISMOGRAPHIC STATION

DEPARTMENT OF GEOLOGY AND GEOGRAPHY

$\phi = 42° 22' 36''$ N. $\lambda = 71° 06' 59''$ W. Gr. h = 5.367 M. FOUNDATION: Glacial sand over clay.

TIME: Mean Greenwich, midnight to midnight.

INSTRUMENTS: Two Bosch-Omori 100 kg. horizontal pendulums (mechanical registration).

No.	Date	Phase	Time	Periods	Amplitudes	Δ	REMARKS
			h. m. s.	s.	μ.	Kms.	
	1921						
	Apr. 1	O	4 postea	∅			No trace on N which is out of order.
		e_E	4 53 28	6			
		eL_E	5 09 22	40			Very marked irregular pulsations from early a.m. until near mid-night.
		L	5 14.0	30			
		M?	5 18 10	28			
		M_E	5 23.10	23			
		L	5 27.0	20			
		C_E	5 31 17	15			
		F	6 06 ca.				
	Apr. 1	O	12 postea				No definite e because of pulsations.
		e?	12 43.4				
		e_E	12 54 45	8			
		eL_E	13 02 26	28			
		L	13 05.0	20			
			13 09.5.				Changed record.
		(C)	13 37.0	15			New record begins
		F	13 52 ca.				
	Apr. 2	O	9 postea				Very distant. P and S masked by microseisms.
		e_E?	10 05 ca.				
		e_E	10				
		eL_E	10 32 08	40			
		L	10 34 30	30			
		eM?	10 35 55	24			
		M	10 36 13				
		M	10 43.0	20			
		C	10 48.0	15			
		F	11 11.5				
	Apr. 3	O?	2 45 31			4100	36.9° of arc.
		S_E	2 58 49	6			Masked by micros.
		eL_E?	3 03 29	15			
		M	3 05 58	15			
		F	3 13 ca.				
	Apr. 4	c	18 31 ca.				Pulsations assume seismic appearance.
		F	18 41 ca				
	Apr. 5	ie	18 57 52	10	A short group of L? waves distinct-		
		F	19 01 20		ly different from pulsations of morning hours.		
	Apr. 7	?	18 29 ca.	12 and 14.	Pulsations assume sismic as-		
		to	19.0		pect and attain max.aplitude for the		
		day.	These pulsations began on Feb.14th.,1921 as well				
marked	phenomena during the daylight hours at station. They are independ-						
ent of	local winds and weather.						

Mimeographed and Issued June 2,1921.

J. B. Woodworth.

(For explanation of Symbols see other side)

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