No. From December 28, 1927 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
CONSTANTS:		N-S	Free Period--15 Secs.; Theoretical Magnification--120 Air Damping: Ratio 10:1				
		E-W	Free Period--18 Secs.; Theoretical Magnification-- 80 Temporary "Damping" by friction.				
TIME			Correction by eye and ear comparison with Harvard Observatory. Records read to nearest second. Expectable error plus or minus 2 s				
B1	Dec 28	0	18-20-31			8200	U.S. Coast & Geodetic Preliminary Determinatio.
		iP_N	18-32-03				
		eP_E	18-32-07				Lat 55N, Long 160E, off Kamchatka. 0--18h-20.5m
		$ePR1_N$	18-36-33				
		iS_E	18-41-33				
		eS_N	18-41-36				
		$eSR1_N$	18-46-33				
		eL_E	18-54-13				L early
		i_N	18-57-20				
		M_{1N}	19-02-51	18	50		
		M_{2N}	19-04-25	18	50-		
		M_{3N}	19-06-03	14	41		
		M_{4N}	19-07-21	14	53		
		M_{5N}	19-08-34	14	29		
		M_{6N}	19-09-57	17	44		
		M_{7N}	19-14-23	16	39		
		F_E	20-05 ca				
		F_N	20-27 ca				
B2	Dec 30	e_N	12-42-11				E-W trace only
		e_N	12-48-01				
		L_N	12-48 to 12-53 ca				
		F_N	13-05 ca				
B3	Dec 31	e_N	19-27.1				
		e_E	19-28.7				
		e_N	19-41.1				
		F_E	19-50 ca				
		F_N	19-55 ca				

(For explanation of Symbols see other side)

EXPLANATION OF SYMBOLS

The symbols, with the exception of a few additional characters, are those adopted by the International Seismological Association after Wiechert of Göttingen.

O.....Time of earthquake at epicentre (or centre). (Seismol. Soc. Amer.).
P.....Longitudinal waves, and their time of arrival at the station.
PR_1..... " " once reflected, and time of arrival at station.
PR_2..... " " twice reflected, and time of arrival at station.
S.....Transverse waves, and time of arrival.
SR_1..... " " once reflected, and time of arrival.
SR_2..... " " twice reflected, and time of arrival.
PS.....Alternating waves, and time of arrival (= PR_1S = SR_1P).
L.....Long or surface or Rayleigh waves, and time of arrival.
M.....Maximum of Long waves, and time of arrival.
M^1, M^2, M^3, etc. ...Successive maxima.
$Lrep_1$.....Long waves reaching the station from the antipodes of the epicentre (anticentre); path 40,000 kms. $- \Delta$.
$Lrep_2$.....Long waves again reaching station from the epicentre; path 40,000 kms. $+ \Delta$.
C.....Cauda, end of Long waves, and beginning of trailers or tail.
F.....Finis, end of record on seismogram.
n.....Superposed phase of another earthquake; *e.g.*, Pn.
e.....(emersio), emergence of a phase not well defined; *e.g.*, eP, eL.
i.....(impetus), a sharply defined impulse; *e.g.*, iP, iS.
AN.....Amplitude of the N–S component of earth particle, deduced from the motion of the pendulum, usually L or M.
AE.....The same for the E–W component of motion.
Az.....The same for the vertical component of motion.
γ.....Gal, or unit acceleration, one centimetre per sec. per sec.
γu .....Milligal, or 1/1000 gal. acceleration of 10 micra per sec. per sec. (Klotz).
ϕ.....Latitude.
λ.....Longitude from Greenwich.
h.....Elevation above mean sea-level.
Δ.....Distance, from epicentre to station; deduced from records.
ca .....Approximately.
T.....Period, complete time of oscillation; for simple pendulum;

$$2\pi\sqrt{\frac{l}{g}}$$

To.....Period of undamped pendulum of seismograph.
Te.....Period of earth particle.
h, m, s.....Time, Greenwich Mean Time, midnight to midnight.
M.....Theoretical magnification of seismograph.
Ma.....Actual magnification, for damping ratio and periods of earth particle and undamped pendulum.
VP, Vs, VL.....Velocity of P, S, and L waves respectively. (Klotz.)
*.....(large star) Epicentre. (After A. Siebert.)

The following notation proposed by Wiechert is employed in many publications. The characters are implied by Δ and A.

I, Notable; II, striking; III, strong; referring to the intensity of earthquakes.

d.....(domesticus), a local shock; *e.g.*, Id.
v.....(vicinus), a nearby earthquake, under 1000 kms. distant; *e.g.*, IIv.
r.....(remotus), a distant earthquake, from 1000 to 5000 kms.
u.....(ultimus), a very distant earthquake, over 5000 kms. distant.

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

KLOTZ, OTTO: Seismological Tables. Publications of the Dominion Observatory, Ottawa. Vol. iii, No. 2, pp. 19–61. 1916.