LITTLE ROCK

LITTLE ROCK COLLEGE SEISMOLOGICAL OBSERVATORY, PULASKI HEIGHTS, LITTLE ROCK, ARK., U. S. A.

(In cooperation with St. Louis University, St. Louis, Mo.—Records kept in St. Louis)

Two Wood-Anderson short-period seismographs, Howard clock, time checked by radio signals.

BULLETIN FOR 1936

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
1	Jan. 2	W-A	eP_N	0h46m53s	
		W-A	eP_E	0 46 56	
		W-A	e_N	1 01 33	
		W-A	eL_N	1 04 35	
		W-A	eL_E	1 04 39	
		W-A	eM_E	1 11 04	
		W-A	eM_N	1 11 24	
		W-A	F	1 41±	
2	Jan. 2	W-A	iP'_N	22h54m00s	$\Delta PR_1-H = 140.^{\circ}0$
		W-A	eP'_E	22 54 01	Manila:
		W-A	i_{EN}	22 54 11	H = 22h34m05s.
		W-A	iPR_{1EN}	22 57 25	Region 1.°0 S, 97.°0 E.
		W-A	eL_E	23 58 31	Felt in western
		W-A	eL_N	23 58 45	Sumatra.
		W-A	F	00 40±	
3.	Jan. 8	W-A	eP_E	6h48m01s	
		W-A	e_N	6 48 13	
		W-A	e_N	6 49 08	
		W-A	e_E	6 49 17	
		W-A	eL_{EN}	6 49 24	
		W-A	F	6 54±	
4	Jan. 14	W-A	eP_E	0h09m05s	$\Delta P-H = 19.^{\circ}3$
		W-A	e_E	0 14 31	H = 00h04m40s.
		W-A	e_N	0 14 40	Off eastern Lower
		W-A	i_N	0 14 51	Californian Coast.
		W-A	iL_N	0 15 33	
		W-A	eL_E	0 15 41	
		W-A	F	0 21±	
5	Jan. 14	W-A	eP_E	14h22m28s	$\Delta S-P = 68.^{\circ}5$
		W-A	iP_E	14 22 29	H = 14h12m25s.
		W-A	i_E	14 22 56	Epicenter: 28.°2 S,
		W-A	iS_E	14 30 44	62.°8 W.
		W-A	iSP_E	14 31 16	Depth 590 km by the
		W-A	i_E	14 31 29	Brunner Depth Chart.
		W-A	iSS_E	14 34 22	No surface waves.
		W-A	iSR_{1E}	14 35 43	
		W-A	F	15 00±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
6	Jan. 18	W-A W-A W-A	eP_E eL_E F	1h28m25s 1 42 42 2 00±	$\Delta P-H = 47°2$ H = 01h19m53s.
7	Jan . 20	W-A W-A	e_E F	6h08m12s 6 09±	
8	Jan. 20	W-A W-A W-A	eL_E eM_E F	17h57m34s 18 10 44 18 15±	Deep. Felt in Mindanao, P. I.
9	Jan. 22	W-A W-A W-A W-A W-A W-A	iP_N ePE iN iE i_N F	9h44m59s 9 45 00 9 45 08 9 45 09 9 45 20 9 50±	Deep. Felt in Southern Sumatra.
10	Jan. 30	W-A W-A W-A W-A	iP_N iP_E iEN F	6h45m58s 6 46 00 6 46 10 6 53±	
11	Feb.3	W-A W-A W-A W-A	eP_N eP_E eL_{EN} F	21h04m20s 21 04 21 21 20 23 21 27±	
12	Feb. 7	W-A W-A W-A W-A W-A	eL_N eL_E eM_N eM_E F	9h47m22s 9 47 29 9 53 41 9 53 49 10 24±	Vicinity 35°5 N, 104°0 E. Destructive in Kansu, China.
13	Feb. 9	W-A W-A W-A W-A	eP_E iP_{EN} iEN F	22h16m02s 22 16 05 22 16 08 22 17 03	Local.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
14	Feb. 10	W-A	e_E	18h20m14s	Region 10°.5 S, 177°.0 E. Depth about 100 km by the Brunner Depth Chart.
		W-A	e_N	18 20 16	
		W-A	$iSKS_{EN}$	18 28 00	
		W-A	iS_{EN}	18 28 55	
		W-A	F	18 35±	
15	Feb. 14	W-A	i_E	0h04m34s	
		W-A	i_N	0 04 36	
		W-A	i_E	0 05 05	
		W-A	i_N	0 05 08	
		W-A	F	0 08±	
16	Feb. 15	W-A	eP'_N	13h06m15s	ΔPR_1-H = 127°.4 H = 12h46m56s. Region 4°.5 S, 133°.0 E. Felt in N. W. New Guinea.
		W-A	eP'_E	13 06 16	
		W-A	ePR_{1E}	13 07 58	
		W-A	ePR_{1N}	13 08 00	
		W-A	$iSKP_{EN}$	13 09 32	
		W-A	$e(SR_1)_{EN}$	13 26 19	
		W-A	eSR_{2E}	13 29 49	
		W-A	eL_N	13 39 45	
		W-A	eL_E	13 40 05	
		W-A	eM_{1N}	13 53 34	
		W-A	eM_{1E}	13 54 08	
		W-A	eM_{2E}	14 02 59	
		W-A	F	15 15±	
17	Feb. 17	W-A	eS_E	5h06m16s	Local shock. ΔS-H = 2°.2 = 250 km. H = 05h05m11s. Felt at Hayti, Mo.
		W-A	eS_N	5 06 17	
		W-A	iL_{EN}	5 06 51	
		W-A	F	5 08 47	
18	Feb. 21	W-A	e_N	17h17m38s	Manila: H = 16h57m28s. Timor Sea.
		W-A	i_E	17 17 39	
		W-A	eM_E	17 53 21	
		W-A	F	18 11±	
19	Feb. 22	W-A	ePR_{1E}	15h52m39s	Wellington: H = 15h31m14s. Near 52°.0 S, 160°.0 E. Felt in southern New Zealand.
		W-A	e_N	15 58 05	
		W-A	e_E	15 58 06	
		W-A	e_E	16 03 37	
		W-A	e_E	16 06 37	
		W-A	e_E	16 10 43	
		W-A	eL_E	16 30 44	
		W-A	eM_E	16 35 19	
		W-A	eM_N	16 35 30	
		W-A	F	17 10±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
20	Feb. 27	W-A	eP'_E	10h23m11s	Δca = 128°0
		W-A	iP'_{EN}	10 23 13	Manila:
		W-A	$e(pPR_1)_{EN}$	10 26 26	H = 10h04m26s.
		W-A	$i(pPR_1)_{EN}$	10 26 28	Region 3°0 S, 133°0E.
		W-A	$iSKP_E$	10 26 39	western New Guinea.
		W-A	$iSKP_N$	10 26 41	Depth about 100 km.
		W-A	F	10 39±	by Brunner Depth Chart. No surface waves.
21	Feb. 28	Quake at	03h		Time doubtful. H = 03h03m37s. Near 53°0 N, 162°0 W. Depth about 80 km by Brunner Depth Chart
22	Mar. 1	W-A	iP_N	19h48m58s	
		W-A	eP_E	19 48 59	
		W-A	i_N	19 49 16	
		W-A	i_E	19 49 17	
		W-A	F	19 52±	
23	Mar. 5	W-A	eP_N	6h14m21s	ΔS-P = 45°4
		W-A	eP_E	6 14 22	Possibly deep.
		W-A	eS_N	6 21 08	
		W-A	F	6 41±	
24	Mar. 8	W-A	iP_N	13h14m29s	Deep.
		W-A	eP_E	13 14 32	
		W-A	i_N	13 15 20	
		W-A	e_E	13 17 49	
		W-A	e_N	13 17 54	
		W-A	i_E	13 18 10	
		W-A	F	13 23±	
25	Mar. 20	W-A	iP_E	17h54m55s	
		W-A	eP_N	17 54 56	
		W-A	i_E	17 55 03	
		W-A	e_N	18 01 52	
		W-A	i_E	18 01 53	
		W-A	i_{EN}	18 02 26	
		W-A	F	18 08±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
26	Mar. 20	W-A	iP_N	18h51m53s	Δ_{S-P} = 24°.7
		W-A	eP_E	18 51 55	H = 18h46m39s.
		W-A	iPR_{1E}	18 52 25	Region 12°.0 N, 83°.0W.
		W-A	iS_E	18 56 18	by St. Louis, Little
		W-A	iSR_{1E}	18 57 15	Rock and Balboa
		W-A	F	19 19±	Heights.
27	Mar. 25	W-A	eP_E	9h07m11s	Δ_{S-P} = 45°.5
		W-A	iP_N	9 07 13	H = 08h58m52s.
		W-A	iPR_{1EN}	9 09 01	Epicenter near 56°.0N.
		W-A	eS_{EN}	9 13 59	32°.0 W.
		W-A	e_E	9 16 42	North Atlantic Ocean.
		W-A	eL_E	9 18 17	
		W-A	eM_E	9 23 33	
		W-A	eM_N	9 23 36	
		W-A	F	9 46±	

Minor Seismic Activity: Jan. 2, 17h47m to 17h56m.
Feb.18, 02h43m to 02h54m.

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Two Wood-Anderson short-period seismographs, Howard clock, time checked by radio signals.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
28	April 1	W-A	eP'_N	2h28m22s	Δ_{PR_1-H} = 130°3
		W-A	eP'_E	2 28 23	H = 02h09m16s
		W-A	ipP'_{EN}	2 28 36	Epicenter: 2°5 N,
		W-A	ePR_{1EN}	2 30 30	123°5 E.
		W-A	$iSKP_{EN}$	2 31 50	Depth 75 km by the
		W-A	$eSKS_{EN}$	2 35 34	Brunner Depth Chart.
		W-A	$eSKKS_{EN}$	2 37 22	
		W-A	ePS_E	2 40 23	
		W-A	ePS_N	2 40 25	
		W-A	$iPPS_N$	2 41 53	
		W-A	$ePPPS_{EN}$	2 43 00	
		W-A	eSR_{1EN}	2 48 14	
		W-A	eL_N	3 10 19	
		W-A	eL_E	3 10 25	
		W-A	eM_{1EN}	3 17 09	
		W-A	eM_{2N}	3 27 41	
		W-A	F	4 35±	
29	April 1	W-A	eP'_{EN}	20h30m02s	Aftershock of No. 28.
		W-A	ePR_{1E}	20 32 00	Δ_{PR_1-H} = 130°1
					H = 20h10m47s
					Lamp burned out.
30	April 2		Quake at	06h	Clock stopped.
					Epicenter near New
					Ireland, 1°0 S,
					150°0 E.
31	April 12	W-A	ePR_{1E}	21h10m52s	Δ_{PR_1-H} = 114°3
		W-A	ePR_{1N}	21 10 56	H = 20h51m21s.
		W-A	ePS_E	21 20 34	Region 10°0 N, 140°0 E
		W-A	eSR_{1EN}	21 26 53	Northwest of Yap
		W-A	eL_E	21 41 24	Island.
		W-A	eL_N	21 41 47	
		W-A	eM_E	21 50 35	
		W-A	F	22 37±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
32	April 14	W-A	e_N	21h13m11s	
		W-A	e_{EN}	21 14 38	
		W-A	eL_N	21 15 29	
		W-A	iM_N	21 16 18	
		W-A	iM_E	21 16 20	
		W-A	F	21 26±	
33	April 19	W-A	$e(P')_E$	5h25m58s	$\Delta PR_1-H = 113°0$
		W-A	iPR_{1E}	5 26 33	H = 05h07m12s.
		W-A	ePR_{2E}	5 29 00	Epicenter: 9°0 S,
		W-A	$eSKKS_{EN}$	5 33 39	156°0 E.
		W-A	eS_{EN}	5 34 21	
		W-A	e_E	5 34 42	
		W-A	iPS_E	5 36 07	
		W-A	ePS_N	5 36 11	
		W-A	$ePPS_E$	5 37 10	
		W-A	e_E	5 39 24	
		W-A	e_N	5 39 37	
		W-A	eSR_{1E}	5 42 37	
		W-A	eL_E	5 49 45	
		W-A	eL_N	5 53 37	
		W-A	eM_N	6 02 55	
		W-A	eM_E	6 03 42	
		W-A	F	7 52±	
34	April 19	W-A	ePR_{1E}	9h25m41s	$\Delta PR_1-H = 131°7$
		W-A	eL_N	10 25 36	H = 09h04m12s.
		W-A	eL_E	10 26 01	Region 11°5 N, 94°0 E
		W-A	F	10 47±	
35	April 23	W-A	eP_E	23h24m55s	$\Delta S-P = 63°6$
		W-A	iP_{EN}	23 24 56	H = 23h14m34s.
		W-A	i_N	23 25 10	Epicenter: 50°5 N,
		W-A	eS_E	23 33 25	178°0 E.
		W-A	eS_N	23 33 26	Depth 100 km by the
		W-A	$eScS_N$	23 34 54	Brunner Depth Chart.
		W-A	F	00 06±	
36	April 24	W-A	e_{EN}	14h40m20s	
		W-A	i_N	14 40 36	
		W-A	i_N	14 40 38	
		W-A	i_{EN}	14 41 06	
		W-A	e_{EN}	14 44 04	
		W-A	F	14 49±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
37	April 27	W-A	eP_N	6h35m18s	$\Delta S-P = 17°1$
		W-A	eP_E	6 35 21	H = 06h31m06s.
		W-A	ipP_N	6 35 29	Epicenter: 16°.3 N,
		W-A	iPR_1N	6 35 42	87°.7 W.
		W-A	iPR_1E	6 35 44	Depth 60 km by the
		W-A	isP_N	6 35 56	Brunner Depth Chart.
		W-A	i_N	6 36 26	
		W-A	i_N	6 36 38	
		W-A	eS_{EN}	6 38 32	
		W-A	isS_{EN}	6 38 56	
		W-A	iSR_1EN	6 39 14	
		W-A	iL_{EN}	6 39 34	
		W-A	F	7 06±	
38	May 5	W-A	e_E	11h01m05s	
		W-A	e_N	11 01 11	
		W-A	eL_E	11 11 05	
		W-A	eL_N	11 11 09	
		W-A	F	11 23±	
39	May 7	W-A	eP_N	10h07m06s	
		W-A	$e(S)_N$	10 12 47	
		W-A	F	10 20±	
40	May 8	W-A	eP_{EN}	5h59m13s	Local.
		W-A	e_E	5 59 40	
		W-A	i_{EN}	5 59 50	
		W-A	F	6 01±	
41	May 8	W-A	eP'_{EN}	9h30m03s	H = 09h11m44s.
		W-A	iP'_N	9 30 04	Region 0°.5 N, 108°.0 E.
		W-A	i_{EN}	9 30 10	West of Borneo.
		W-A	ePR_1N	9 32 29	Deep focus.
		W-A	$iSKP_N$	9 33 45	
		W-A	F	9 43±	
42	May 8	W-A	eP_N	17h30m33s	Deep.
		W-A	eP_E	17 30 35	
		W-A	eL_E	17 44 00	
		W-A	eL_N	17 44 12	
		W-A	F	17 53±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
43	May 11	W-A	ePR_1E	17h46m53s	$\Delta PR_1-H = 113°.0$
		W-A	$eSKKS_{EN}$	17 52 46	H = 17h27m32s.
		W-A	eSR_2E_N	18 07 35	Region 6°.5 S, 150°.5 E
		W-A	eL_N	18 16 05	South of New Britain.
		W-A	eM_E	18 22 27	
		W-A	eM_N	18 25 35	
		W-A	F	19 09±	
44	May 19	W-A	iP_{EN}	7h40m56s	Deep.
		W-A	i_N	7 41 10	South China Sea.
		W-A	i_E	7 41 11	
		W-A	F	7 51±	
45	May 19	W-A	e_N	21h12m42s	Several shocks.
		W-A	e_E	21 12 44	
		W-A	e_N	21 17 01	
		W-A	e_N	21 35 57	
		W-A	i_{EN}	21 50 01	
		W-A	i_{EN}	21 50 09	
		W-A	F	21 54±	
46	May 20	W-A	ePR_1E	3h24m22s	$\Delta PR_1-H = 110°.2$
		W-A	$eSKS_{EN}$	3 30 30	H = 03h05m21s.
		W-A	iPS_E	3 33 50	Epicenter: 7°.7 S,
		W-A	eSR_1E	3 40 09	159°.6 E.
		W-A	eSR_2E	3 44 18	
		W-A	eL_E	3 55 26	
		W-A	eM_E	4 01 01	
		W-A	eM_N	4 01 24	
		W-A	F	5 02±	
47	May 22	W-A	eP_N	0h37m20s	$\Delta P-H = 69°.0$
		W-A	eP_E	0 27 26	H = 00h16m20s.
			(Lost in changing records)		North central Argentina. Possibly deep.
48	May 26	W-A	eP_N	17h24m46s	
		W-A	i_N	17 25 25	
		W-A	i_N	17 28 26	
		W-A	F	17 31±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
49	May 28	W-A	eP_{EN}	18h54m38s	$\Delta_{S-P} = 27.^{\circ}0$
		W-A	iP_{N}	18 54 40	H = 18h49m11s.
		W-A	ipP_{EN}	18 55 20	Epicenter: 9.°0 N,
		W-A	iPR_{1EN}	18 55 46	103.°5 W.
		W-A	iS_{N}	18 59 00	Depth 270 km by the
		W-A	isS_{N}	19 00 26	Brunner Depth Chart.
		W-A	iSR_{1EN}	19 01 20	
		W-A	eL_{N}	19 02 16	
		W-A	eL_{E}	19 02 25	
		W-A	iL_{E}	19 02 43	
		W-A	iM_{N}	19 06 59	
		W-A	F	20 46±	

Minor Seismic Activity: April 7, 02h; April 27, 01h00m to 01h19m;
May 10, 06h07m to 06h11m; May 15, 07h57m to 08h00m;
May 23, 08h02m to 08h40m; May 29, 15h03m to 15h24m.

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No.	Date	Inst.	Phase	G.M.C.T.	Remarks
50	June 3	W-A	e_E	3h04m46s	Distant. Possibly Japan.
		W-A	e_N	3 19 49	
		W-A	F	3 39±	
51	June 3	W-A	eP_{NE}	9h21m02s	$\Delta S-P = 27°.2$
		W-A	ip_{NE}	9 21 14	H = 09h15m20s.
		W-A	$eP_{?N}$	9 21 46	Epicenter: 40°.7 N,
		W-A	$iP_{?N}$	9 21 57	125°.5 W.
		W-A	i_N	9 23 43	Depth by the Brunner
		W-A	e_E	9 25 33	Depth Chart probably
		W-A	eS_E	9 25 44	over 50 km.
		W-A	$eS_{?N}$	9 26 57	
		W-A	eL_{NE}	9 29 26	
		W-A	$eM_{?N}$	9 30 17	
		W-A	$eM_{?E}$	9 32 51	
		W-A	F	10 30±	
52	June 5	W-A	eP_N	14h59m48s	Deep
		W-A	iP_{NE}	14 59 51	
		W-A	e_E	15 00 58	
		W-A	F	15 05±	

Station not in operation from June 5 to October 10, 1936.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
53	Oct 10	W-A	e_E	1h31m08s	Weak beginning.
		W-A	e_{NE}	1 31 21	
		W-A	i_{NE}	1 31 27	
		W-A	e_{NE}	1 35 33	
		W-A	e_N	1 35 59	
		W-A	eL_N	1 42 03	
		W-A	F	1 49±	
54	Oct 19	W-A	e_N	12h27m01s	No surface waves
		W-A	i_E	12 27 03	
		W-A	i_{NE}	12 27 14	
		W-A	e_{NE}	12 27 47	
		W-A	F	12 35±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
55	Oct 20	W-A	iPnNE	21h17m45s	Δ_{Sn-Pn} = 2°.8 or
		W-A	iP*N	21 17 50	193 miles.
		W-A	iPgNE	21 18 00	H = 21h17m00s.
		W-A	iNE	21 18 11	Southeastern Missouri
		W-A	iSnNE	21 18 19	near New Madrid.
		W-A	iS*N	21 18 26	Not reported felt.
		W-A	F	21 24±	
56	Oct 23	W-A	ePN	6h32m33s	Δ_{S-P} = 44°.9
		W-A	iPNE	6 32 35	Epicenter 60°.8 N.
		W-A	ipPNE	6 32 40	149°.4 W.
		W-A	iPR2N	6 34 32	H = 06h24m27s.
		W-A	eN	6 39 11	Depth somewhat less
		W-A	eSNE	6 39 17	than 25 km.
		W-A	esSNE	6 39 25	Reported felt at
		W-A	eSR1N	6 42 40	Anchorage Alaska.
		W-A	eLN	6 46 47	
		W-A	eMN	6 48 51	
		W-A	F	8 10±	
57	Oct 23	W-A	eE	16h48m14s	Weak.
		W-A	eN	16 48 25	
		W-A	eNE	16 49 35	
		W-A	eLN	16 49 38	
		W-A	F	17 00±	
58	Oct 23	W-A	ePNE	19h49m45s	
		W-A	iNE	19 50 25	
		W-A	eN	19 50 48	
		W-A	F	19 52±	
59	Oct 24	W-A	ePN	13h00m39s	
		W-A	eN	13 00 41	
		W-A	iNE	13 01 01	
		W-A	iNE	13 01 11	
		W-A	F	13 04±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
60	Oct 26	W-A	eP_{NE}	23h15m18s	Δ_{S-P} = 45?8
		W-A	$i(P)_{NE}$	23 15 33	Depth nearly normal.
		W-A	iN	23 16 03	Probably Alaska.
		W-A	eE	23 16 14	
		W-A	ePR_{2NE}	23 17 30	
		W-A	eN	23 21 48	
		W-A	eS_E	23 22 08	
		W-A	eL_E	23 32 36	
		W-A	eM_E	23 38 48	
		W-A	F	24 00±	
61	Oct 29	W-A	iP_N	5h58m27s	Δ_{S-P} = 26°5
		W-A	iPR_{1NE}	5 59 04	Panama Balboa Heights
		W-A	eN	5 59 13	reports: Felt in David
		W-A	$e(S)_{NE}$	6 03 06	and Santiago.
		W-A	eN	6 03 44	
		W-A	eL_{NE}	6 06 02	
		W-A	F	6 30±	
62	Oct 29	W-A	eL_E	19h17m20s	Distant.
		W-A	F	20 00±	

Minor Seismic Activity: Oct 24, 3h7m to 3h11m; Oct 28, 16h56m to 17h02m; Oct 29, 8h40m to 8h43m.

J. B. Macelwane, S.J.
Director

R. R. Heinrich
Graduate Fellow

LITTLE ROCK

LITTLE ROCK COLLEGE SEISMOLOGICAL OBSERVATORY, PULASKI HEIGHTS, LITTLE ROCK, ARK., U. S. A.
(In cooperation with St. Louis University, St. Louis, Mo.—Records kept in St. Louis)

Two Wood-Anderson short-period seismographs, Howard clock, time checked by radio signals.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
63	Nov 1	W-A	iPn$_{NE}$	4h11m36s	ΔSn-Pn = 1°.8 or 125 miles.
		W-A	iP*$_{N}$	4 11 38	H = 04h11m05s.
		W-A	iPg$_{NE}$	4 11 41	Southeastern Missouri,
		W-A	iSN$_{NE}$	4 11 59	not reported felt.
		W-A	iS*$_{NE}$	4 12 02	
		W-A	F	4 14±	
64	Nov 2	W-A	eP$_{NE}$	15h09m55s	ΔS-P = 76°.6
		W-A	i$_{NE}$	15 10 09	Epicenter by Strasbourg
		W-A	ePR$_{1NE}$	15 12 51	50°.0 N, 156°.0 E, off
		W-A	eS$_{E}$	15 19 44	Kamtschatka.
		W-A	eL	15 37 17	
		W-A	F	16 13±	
65	Nov 2	W-A	eP$_{NE}$	20h59m03s	ΔS-P = 91°.6
		W-A	ipP$_{NE}$	20 59 21	H = 20h45m58s.
		W-A	iPR$_{1E}$	21 01 51	Epicenter: 37°.8 N,
		W-A	eS$_{NE}$	21 09 55	142°.1 E,
		W-A	esS$_{NE}$	21 10 14	Depth by the Brunner
		W-A	e$_{N}$	21 10 22	Depth Chart 50 km.
		W-A	eL$_{N}$	21 26 30	According to Chiufeng,
		W-A	F	22 30±	Destructive in Fukujama,
					Japan with intensities
					R. F. VII and VIII
66	Nov 3	W-A	e$_{NE}$	5h56m05s	Beginning very weak.
		W-A	i(S)$_{NE}$	5 57 59	Motion fast.
		W-A	i$_{NE}$	5 58 07	
		W-A	F	6 05±	
67	Nov 12	W-A	e(P)$_{N}$	4h32m00s	Deep?
		W-A	e$_{N}$	4 32 11	
		W-A	F	4 47±	
68	Nov 12	W-A	iP$_{NE}$	20h16m58s.	ΔS-P = 80°.4
		W-A	ipP$_{NE}$	20 17 06	Kurile Islands. Depth
		W-A	i$_{NE}$	20 17 46	at least 40 km by the
		W-A	iE	20 20 06	Brunner Depth Chart.
		W-A	iS$_{NE}$	20 27 04	
		W-A	isS$_{NE}$	20 27 18	
		W-A	F	20 42±	

LITTLE ROCK

LITTLE ROCK COLLEGE SEISMOLOGICAL OBSERVATORY, PULASKI HEIGHTS, LITTLE ROCK, ARK., U. S. A.

(In cooperation with St. Louis University, St. Louis, Mo.—Records kept in St. Louis)

Two Wood-Anderson short-period seismographs, Howard clock, time checked by radio signals.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
63	Nov 1	W-A	iPn$_{NE}$	4h11m36s	ΔSn-Pn = 1°.8 or 125 miles.
		W-A	iP*$_{N}$	4 11 38	H = 04h11m05s.
		W-A	iPg$_{NE}$	4 11 41	Southeastern Missouri,
		W-A	iSN$_{NE}$	4 11 59	not reported felt.
		W-A	iS*$_{NE}$	4 12 02	
		W-A	F	4 14±	
64	Nov 2	W-A	eP$_{NE}$	15h09m55s	ΔS-P = 76°.6
		W-A	i$_{NE}$	15 10 09	Epicenter by Strasbourg
		W-A	ePR$_{1NE}$	15 12 51	50°.0 N, 156°.0 E, off
		W-A	eS$_{E}$	15 18 44	Kamtschatka.
		W-A	eL	15 37 17	
		W-A	F	16 13±	
65	Nov 2	W-A	eP$_{NE}$	20h59m03s	ΔS-P = 91°.6
		W-A	ipP$_{NE}$	20 59 21	H = 20h45m58s.
		W-A	iPR$_{1E}$	21 01 51	Epicenter: 37°.8 N,
		W-A	eS$_{NE}$	21 09 55	142°.1 E,
		W-A	esS$_{NE}$	21 10 14	Depth by the Brunner
		W-A	e$_{N}$	21 10 22	Depth Chart 50 km.
		W-A	eL$_{N}$	21 26 30	According to Chiufeng,
		W-A	F	22 30±	Destructive in Fukujama,
					Japan with intensities
					R. F. VII and VIII
66	Nov 3	W-A	e$_{NE}$	5h56m05s	Beginning very weak.
		W-A	i(S)$_{NE}$	5 57 59	Motion fast.
		W-A	i$_{NE}$	5 58 07	
		W-A	F	6 05±	
67	Nov 12	W-A	e(P)$_{N}$	4h32m00s	Deep?
		W-A	e$_{N}$	4 32 11	
		W-A	F	4 47±	
68	Nov 12	W-A	iP$_{NE}$	20h16m58s.	ΔS-P = 80°.4
		W-A	ipP$_{NE}$	20 17 06	Kurile Islands. Depth
		W-A	i$_{NE}$	20 17 46	at least 40 km by the
		W-A	iE	20 20 06	Brunner Depth Chart.
		W-A	iS$_{NE}$	20 27 04	
		W-A	isS$_{NE}$	20 27 18	
		W-A	F	20 42±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
69	Nov 13	W-A	$ePNE$	12h42m38s	$\Delta P-H = 69^{\circ}.5$
		W-A	$iPNE$	12 42 39	H = 21h31m37s
		W-A	$ipPNE$	12 42 50	Epicenter: 56°.7 N,
		W-A	iPR_1E	12 45 18	162°.3 E.
		W-A	eS_E	12 51 41	Depth by the Brunner
		W-A	esS_E	12 51 59	Depth Chart 40 to 50 km.
		W-A	eL_E	13 00 41	
		W-A	eM_E	13 04 03	
		W-A	F	15 00±	
70	Nov 14	W-A	$e(P)_N$	1h41m55s	Deep.
		W-A	$e(P)_E$	1 41 57	
		W-A	F	1 47±	
71	Nov 14	W-A	$e(P)_N$	14h40m55s	
		W-A	F	14 43±	
72	Nov 15	W-A	$e(P)_{NE}$	22h31m42s	
		W-A	i_{NE}	22 31 56	
		W-A	F	22 42±	
73	Nov 19	W-A	ePN	21h15m02s	$\Delta P-H = 20^{\circ}.4$
		W-A	ipP_N	21 15 13	H = 21h10m30s
		W-A	iPR_1N	21 15 33	Epicenter: 14°.3 N,
		W-A	iS_N	21 18 56	90°.7 W. Depth by the
		W-A	isS_N	21 19 16	Brunner Depth Chart
		W-A	$iPcP_N$	21 19 21	nearly 100 km.
		W-A	$isSR_1N$	21 19 36	
		W-A	eL_N	21 20 54	
		W-A	M	21 22 33	
		W-A	F	(Lost in following quake)	
74	Nov 19	W-A	ePN	21h48m57s	Aftershock of No. 73.
		W-A	ePR_1N	21 49 26	
		W-A	eS_N	21 52 52	
		W-A	F	22 12±	
75	Nov 19	W-A	eP_N	24h25m24s	Aftershock of No. 73
		W-A	eS_N	24 29 27	
		W-A	F	(Lost in changing records)	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
69	Nov 13	W-A	ePNE	12h42m38s	ΔP-H = 69°.5
		W-A	iPNE	12 42 39	H = 21h31m37s
		W-A	ipPNE	12 42 50	Epicenter: 56°.7 N,
		W-A	iPR$_1$E	12 45 18	162°.3 E.
		W-A	eS$_E$	12 51 41	Depth by the Brunner
		W-A	esS$_E$	12 51 59	Depth Chart 40 to 50 km.
		W-A	eL$_E$	13 00 41	
		W-A	eM$_E$	13 04 03	
		W-A	F	15 00±	
70	Nov 14	W-A	e(P)$_N$	1h41m55s	Deep.
		W-A	e(P)$_E$	1 41 57	
		W-A	F	1 47±	
71	Nov 14	W-A	e(P)$_N$	14h40m55s	
		W-A	F	14 43±	
72	Nov 15	W-A	e(P)$_{NE}$	22h31m42s	
		W-A	i$_{NE}$	22 31 56	
		W-A	F	22 42±	
73	Nov 19	W-A	eP$_N$	21h15m02s	ΔP-H = 20°.4
		W-A	ipP$_N$	21 15 13	H = 21h10m30s
		W-A	iPR$_1$N	21 15 33	Epicenter: 14°.3 N,
		W-A	iS$_N$	21 18 56	90°.7 W. Depth by the
		W-A	isS$_N$	21 19 16	Brunner Depth Chart
		W-A	iPcP$_N$	21 19 21	nearly 100 km.
		W-A	isSR$_1$N	21 19 36	
		W-A	eL$_N$	21 20 54	
		W-A	M	21 22 33	
		W-A	F	(Lost in following quake)	
74	Nov 19	W-A	eP$_N$	21h48m57s	Aftershock of No. 73.
		W-A	ePR$_1$N	21 49 26	
		W-A	eS$_N$	21 52 52	
		W-A	F	22 12±	
75	Nov 19	W-A	eP$_N$	24h25m24s	Aftershock of No. 73
		W-A	eS$_N$	24 29 27	
		W-A	F	(Lost in changing records)	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
76	Nov 22	W-A	$ePNE$	16h49m47s	$\Delta S-P = 40\overset{\circ}{.}0$
		W-A	$e(pP)_N$	16 49 55	Depth by the Brunner
		W-A	eS_N	16 52 51	Depth Chart near 40 km.
		W-A	eS_E	16 52 53	
		W-A	$e(sS)_N$	16 53 05	
		W-A	F	17 00±	
77	Nov 22	W-A	iP_N	18h24m03s	$\Delta P-H = 21\overset{\circ}{.}1$
		W-A	iP_E	18 24 04	$\Delta S-P = 20\overset{\circ}{.}9$
		W-A	ipP_N	18 24 18	$\Delta meas = 21\overset{\circ}{.}1$
		W-A	iPR_1NE	18 24 30	H = 18h19m25s.
		W-A	iS_{NE}	18 27 47	Epicenter: $13\overset{\circ}{.}7$ N,
		W-A	isS_{NE}	18 28 23	$90\overset{\circ}{.}7$ W.
		W-A	iSR_{NE}	18 28 37	Depth by the Brunner
		W-A	$isSR_1NE$	18 29 08	Depth Chart nearly 100
		W-A	iL_{NE}	18 29 48	km.
		W-A	eM_E	18 32 32	
		W-A	F	19 00±	
78	Nov 23	W-A	$ePnNE$	9h39m33s	$\Delta Sn-Pn = 2\overset{\circ}{.}6$ or 181 miles.
		W-A	$iSnNE$	9 40 06	H = 09h38m49s.
		W-A	iS^*NE	9 40 13	Region S.E. Missouri.
		W-A	F	9 41±	Not reported felt.
79	Nov 24	W-A	$e(P)_{NE}$	12h30m59s	Character indistinct.
		W-A	e_{NE}	12 35 32	Very Large.
		W-A	e_{NE}	12 38 31	Microseisms.
		W-A	F	12 40±	
80	Nov 25	W-A	$e(Pn)_E$	17h42m41s	$\Delta Sn-Pn = 2\overset{\circ}{.}6$
		W-A	$e(Sn)_E$	17 43 15	Probably same as No. 78.
		W-A	$e(S^*)_E$	17 43 19	Less intense.
		W-A	F	17 44±	
81	Nov 26	W-A	eP_E	2h17m30s	$\Delta S-P = 24\overset{\circ}{.}8$
		W-A	ePR_2E	2 18 09	Off central American
		W-A	eS_E	2 21 56	Pacific Coast.
		W-A	L	2 24 01	
		W-A	F	3 00±	
82	Nov 27	W-A	eNE	2h14m10s	Weak.
		W-A	F	2 22±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
76	Nov 22	W-A	$ePNE$	16h49m47s	$\Delta S-P = 40°.0$
		W-A	$e(pP)N$	16 49 55	Depth by the Brunner
		W-A	eSN	16 52 51	Depth Chart near 40 km.
		W-A	eSE	16 52 53	
		W-A	$e(sS)N$	16 53 05	
		W-A	F	17 00±	
77	Nov 22	W-A	iPN	18h24m03s	$\Delta P-H = 21°.1$
		W-A	iPE	18 24 04	$\Delta S-P = 20°.9$
		W-A	$ipPN$	18 24 18	$\Delta meas = 21°.1$
		W-A	iPR_1NE	18 24 30	H = 18h19m25s.
		W-A	$iSNE$	18 27 47	Epicenter: 13°.7 N,
		W-A	$isSNE$	18 28 23	90°.7 W.
		W-A	iSR_1NE	18 28 37	Depth by the Brunner
		W-A	$isSR_1NE$	18 29 08	Depth Chart nearly 100
		W-A	$iLNE$	18 29 48	km.
		W-A	eME	18 32 32	
		W-A	F	19 00±	
78	Nov 23	W-A	$ePnNE$	9h39m33s	$\Delta Sn-Pn = 2°.6$ or 181 miles.
		W-A	$iSnNE$	9 40 06	H = 09h38m49s.
		W-A	$iS*NE$	9 40 13	Region S.E. Missouri.
		W-A	F	9 41±	Not reported felt.
79	Nov 24	W-A	$e(P)NE$	12h30m59s	Character indistinct.
		W-A	eNE	12 35 32	Very Large.
		W-A	eNE	12 38 31	Microseisms.
		W-A	F	12 40±	
80	Nov 25	W-A	$e(Pn)E$	17h42m41s	$\Delta Sn-Pn = 2°.6$
		W-A	$e(Sn)E$	17 43 15	Probably same as No. 78.
		W-A	$e(S*)E$	17 43 19	Less intense.
		W-A	F	17 44±	
81	Nov 26	W-A	ePE	2h17m30s	$\Delta S-P = 24°.8$
		W-A	ePR_2E	2 18 09	Off central American
		W-A	eSE	2 21 56	Pacific Coast.
		W-A	L	2 24 01	
		W-A	F	3 00±	
82	Nov 27	W-A	eNE	2h14m10s	Weak.
		W-A	F	2 22±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
83	Nov 29	W-A W-A W-A	e_N e_N F	5h34m13s 5 34 49 5 36±	Weak.

Minor Seismic Activity: Nov. 5, 9h56m to 9h58m; Nov 12, 2h39m to 2h42m; Nov 14, 19h49m to 19h42m; Nov 15, 22h13m 50 22h14m; Nov 17, 3h51m to 3h54m; Nov 17, 18h35m to 18h37m; Nov 30, 23h9m to 23h12m; Nov 30, 24h8m to 24h11m.

On Nov 17, the microseisms were exceptionally large from 10h00m to 24h00m.

J. B. Macelwane, S.J.
Director

R. R. Heinrich
Graduate Fellow

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
83	Nov 29	W-A W-A W-A	e_N e_N F	5h34m13s 5 34 49 5 36±	Weak.

Minor Seismic Activity: Nov. 5, 9h56m to 9h58m; Nov 12, 2h39m to 2h42m; Nov 14, 19h49m to 19h42m; Nov 15, 22h13m 50 22h14m; Nov 17, 3h51m to 3h54m; Nov 17, 18h35m to 18h37m; Nov 30, 23h9m to 23h12m; Nov 30, 24h8m to 24h11m.

On Nov 17, the microseisms were exceptionally large from 10h00m to 24h00m.

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LITTLE ROCK

LITTLE ROCK COLLEGE SEISMOLOGICAL OBSERVATORY, PULASKI HEIGHTS, LITTLE ROCK, ARK., U. S. A.

(In cooperation with St. Louis University, St. Louis, Mo.—Records kept in St. Louis)

Two Wood-Anderson short-period seismographs, Howard clock, time checked by radio signals.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
84	Dec 18	W-A	eN	11h22m14s	
		W-A	e_{NE}	11 22 35	
		W-A	e_{NE}	11 22 54	
		W-A	F	11 23 24	
85	Dec 20	W-A	iP_N	2 48 13	Δ_{S-P} = 20°7
		W-A	iPR_{2NE}	2 48 41	
		W-A	eS_{NE}	2 52 02	Epicenter: 14°2 N,
		W-A	iP_cP_{NE}	2 52 17	88°6 W.
		W-A	iSR_{2NE}	2 52 32	H = 2h43m29s
		W-A	e_{NE}	2 52 47	Destructive in San
		W-A	eL_N	2 53 52	Vicente and nearby
		W-A	F	3 30 ±	towns of Salvador
86	Dec 20	W-A	eN	13h28m07s	Aftershock of No. 85.
		W-A	eN	13 28 16	
		W-A	iNE	13 28 21	
		W-A	eS_{NE}	13 32 22	
		W-A	F	14 00 ±	
87	Dec 20	W-A	iN	18h49m09s	Weak.
		W-A	i_{NE}	18 49 26	
		W-A	F	18 55 ±	
88	Dec 21	W-A	eP_E	19h09m51s	Δ_{P-H} = 33°3
		W-A	eS_E	19 15 20	H = 19h03m09s
		W-A	eM_E	19 22 33	Epicenter: 53°2 N,
		W-A	F	Lost in following earthquake.	131°3 W.
89	Dec 21	W-A	e_E	19h34m37s	Aftershock of No. 88.
		W-A	e_E	19 35 03	
		W-A	F	20 15 ±	
90	Dec 25	W-A	eP_{NE}	20h08m45s	Δ_{P-H} = 20°4
		W-A	eS_N	20 12 37	H = 20h04m07s
		W-A	e_E	20 12 44	Epicenter: 17°7 N,
		W-A	eL_E	20 15 22	105°0 W.
		W-A	F	20 30 ±	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
91	Dec 29	W-A	e_N	14h04m40s	
		W-A	i_{NE}	14 04 53	
		W-A	i_N	14 06 04	
		W-A	F	14 15 ±	
92	Dec 29	W-A	$e(PR_1)E$	15h07m09s	ΔpPR_1-H = 112°8
		W-A	$epPR_1NE$	15 07 49	H = 14h48m07s
		W-A	e_{NE}	15 09 49	Depth by Brunner Depth
		W-A	$esSP_E$	15 16 55	Chart 200+ km.
		W-A	eL_N	15 37 44	Epicenter: 4°.8 S,
		W-A	eL_E	15 39 14	154°2 E by Adelaide,
		W-A	F	16 15 ±	Chiufung, Riverview, and Pasadena.

Minor Seismic Activity: Dec. 16, 8h32m to 8h35m; Dec. 18, 5h11m to 5h16m.

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Rev. Joseph A. Murray
Director of the Station