

**FLORISSANT****SEISMOGRAPHIC STATION, ST. LOUIS UNIVERSITY, ST. LOUIS, MO., U. S. A.**

Three Galitzin-Wilip, two Wood-Anderson short-period seismographs, Shortt synchronome clock

Bulletin for 1937

1.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
1	Jan 2	G-W G-W G-W G-W G-W G-W G-W	ePZ i(S)Z iZ iN iEN iZ F	22h39m33s 22 43 03 22 45 06 22 46 03 22 46 57 22 48 15 23 00 ±	
2	Jan 5	G-W G-W G-W	iE eMZ F	0h32m30s 1 03 30 1 12 ±	
3	Jan 5	G-W G-W	eMZ F	5h50m24s 6 01 ±	
4	Jan 7	G-W G-W G-W G-W G-W	iZ iZNE eZ eLZNE F	6h25m00s 6 35 42 6 37 30 6 45 36 8 00 ±	
5	Jan 11	G-W W-A G-W G-W G-W W-A G-W G-W G-W W-A G-W G-W G-W G-W G-W G-W G-W	iPNE iN iPNE iPR <sub>1</sub> N iPR <sub>2</sub> N eN iSNE iSSNE iSSR <sub>1</sub> NE iSR <sub>2</sub> N iLN eMN F	13h26m15s 13 26 34 13 26 37 13 26 43 13 27 22 13 29 10 13 30 19 13 31 00 13 31 26 13 32 16 13 33 26 13 36 26 (Lost in next earthquake)	$\Delta_{S-P} = 23^{\circ}4$ H = 13h21m17s Depth by the Brunner Depth Chart 120+ km. Epicenter: near 15°6 N, 95°5 W.
6	Jan 11	G-W W-A G-W G-W G-W W-A G-W G-W	iPN iN iN iSN iN F	13h49m20s 13 50 06 13 50 26 13 53 37 13 53 56 13 55 ±	Aftershock of No. 5.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
7	Jan 19	G-W G-W G-W G-W G-W G-W G-W	iPZN iS <sub>NE</sub> i(SR <sub>1</sub> )ZNE iLZNE iZNE iM <sub>NE</sub> F	22h24m50s 22 29 37 22 31 04 22 32 13 22 33 07 22 34 05 23 15 ±	$\Delta_{S-P} = 27^{\circ}4$
8	Jan 23	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	iPR <sub>1</sub> Z iPR <sub>2</sub> Z iE iSPN iZ iNE iN e(SR <sub>3</sub> )E eN eMN F	11h15m19s 11 17 22 11 22 30 11 24 04 11 24 50 11 25 16 11 30 58 11 36 34 11 39 38 11 51 48 (Lost in changing records)	$\Delta = 107^{\circ}0$ In vicinity of Salomon Isles. Strasbourg gives 1.0 S, 157 <sup>00</sup> E.
9	Jan 25	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	ePZ ePR <sub>1</sub> Z iZ ePR <sub>2</sub> ZE iZ iZN iSZSN iSR <sub>1</sub> Z iZ eLE eMZE F	6h48m31s 6 53 00 6 53 44 6 55 18 7 02 29 7 04 18 7 05 48 7 08 42 7 09 28 7 25 18 7 32 18 9 30 ±	$\Delta_{P-H} = 109^{\circ}8$ H = 6h34m00s Epicenter: 1096 S, 163 <sup>03</sup> E. Depth: normal.
10	Jan 30	W-A W-A W-A W-A W-A W-A	eP <sub>N</sub> N ePN iN iN iN iS <sub>N</sub> N	8h57m53.1s 8 58 03.7 8 58 04.4 8 58 06.1 8 58 10 8 58 22	$\Delta = 183$ miles. New Madrid Region Epicenter: $\phi =$ 36.2 N, $\lambda = 89.7$ W., less than 5 miles WNW of Caruthers- ville, Missouri. Intensity on Wood Neuman Scale about III H = 8h57m09.5s
11	Jan 31	G-W W-A G-W G-W G-W	eNE iN iN F	2h12m25s 2 13 17 2 14 49 2 16 ±	Weak

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Minor Seismic Activity: Jan. 1, 18h07m to 20h 19m; 22h16m to 22h26m;  
Jan. 2, 3h52m to 4h05m; 5h20m to 6h05m; 17h35m to 21h35m; Jan. 3,  
1h00m to 20h00m; Jan. 5, 9h23m to 9h39m; 21h55m to 23h35m; Jan. 6,  
16h22m to 17h01m; Jan. 8, 9h35m to 12h53m; 16h03m to 16h13m;  
19h55m to 20h15m; Jan. 9, 4h01m to 4h06m; Jan. 13, 9h31m to 12h06m;  
15h06m to 15h33m; Jan. 14, 2h10m to 2h25m, Jan. 15, 4h41m to 4h50m;  
7h38m to 7h42m; 15h27m to 18h15m; Jan. 16, 17h36m to 19h06m; Jan. 17,  
00h13m to 1h48m; 2h56m to 5h06m; 22h23m to 22h25m; Jan. 18, 8h42m  
to 9h28m; Jan. 21, 1h08m to 1h48m; 15h10m to 15h20m; Jan. 22, 5h28m  
to 5h47m; Jan. 31, 5h10m to 6h03m.

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J. B. Macelwane S.J.  
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4.

No.	Date	Inst.	Phase	G. M. C. T.	Remarks
12	Feb 1	G-W G-W G-W G-W	eN eE e(L)E F	21h14m02s 21 15 16 21 26 02 22 07 ±	Weak. Distant.
13	Feb 2	G-W G-W G-W	eE eLN F	16h33m38s 16 55.7 17 23 ±	Weak.
14	Feb 7	W-A G-W G-W G-W G-W G-W G-W G-W	ePE ePNZ iPZE e(S)N eSZE eN iMN F	4h47m06s 4 47 06 4 47 07 4 51 41 4 51 43 4 54.3 4 55.7 5 05 ±	Time doubtful. $\Delta_{S-P} = 26^{\circ}2$ Normal depth. H = 4h41m29s Epicenter region of $\phi = 40^{\circ}0$ N., $\lambda = 124^{\circ}6$ W. Epicenter deter- mined on the basis of data of Madison, Butte, Fordham, Phila- delphia, Weston, Sitka, Victoria, and Ottawa.
15	Feb 15	W-A G-W G-W G-W W-A G-W	e(P)E eZ e(S)N eE F	2h23m14s 2 23 17 2 27 52 2 27 59 2 50 ±	Weak.
16	Feb 21	G-W G-W W-A G-W G-W G-W G-W G-W G-W G-W G-W	ePZ iE iZE eNEZ ipNEZ iz i(PR <sub>1</sub> )Z i(pPR <sub>1</sub> )Z eSKSZ	7h14m52s 7 14 55 7 15 00 7 15 06 7 15 07 7 17 13 7 17 59 7 18 06 7 24 51	$\Delta_{P-H} = 80^{\circ}8$ $\Delta_{S-P} = 80^{\circ}8$ $\Delta_{meas} = 80^{\circ}8$ H = 7h02m45s h = 50 to 60 km. by the Brunner Depth Chart. $\phi = 45^{\circ}2$ N., $\lambda = 148^{\circ}6$ E.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
16 (cont.)	Feb 21	G-W G-W G-W G-W	iSE ize iN iE F	7 24 59 7 25 04 7 25 08 7 25 22	(Lost in following shock)
17	Feb 21	W-A W-A	ePE e(S)E F	7h38m53s 7 48 54	Probably an after-shock of No. 16. (Lost in following shock)
18	Feb 21	W-A	e(P)E	8h02m11s	Probably an after-shock of No. 16.
19	Feb 21	W-A W-A W-A W-A W-A	e(P)E iE e(S)E i(S)E F	8h11m02s 8 11 13 8 21 37 8 21 38	Aftershock of No. 16. (Lost in microseisms)
20	Feb 21	W-A W-A	i(P)E e(S)E F	11h04m25s 11 14 25	Aftershock of No. 16 (Lost in microseisms)
21	Feb 23	G-W G-W G-W W-A G-W G-W G-W G-W G-W G-W	ePEZ iz iSE eSE eSN e(L)E eE eLN eM F	1h00m35s 1 00 37 1 10 39 1 10 39 1 10 40 1 22.2 1 26.2 1 26.2 1 26.2 1 32.2 2 27 ±	Normal. Probably an aftershock of No. 16.

Minor Seismic Activity: Feb. 1, 16h42m to 21h08m; Feb. 3, 23h11m to 23h13m; Feb. 4, 7h07m to 13h29m; Feb. 5, 16h32m to 3h24m on Feb. 6; Feb. 7, 14h43m to 19h00m on Feb. 9; Feb. 9, 18h35m to 12h00m on Feb. 10; Feb. 11, 11h58m to 12h12m; 15h00m to 09h19m on Feb. 12; Feb. 12, 15h00m to 12h58m on Feb. 13; Feb. 13, 18h01m to 21h16m on Feb. 14; Feb. 15, 15h52m to 13h02m on Feb. 16; Feb. 16 15h40m to 20h05m; Feb. 17, 9h47m to 10h26m; Feb. 19, 15h51m to 22h17m on Feb. 22; Feb. 23, 19h03m to 13h 32m on Feb. 26.



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No.	Date	Inst.	Phase	G. M. C. T.	Remarks
22	Mar. 3	G-W G-W G-W G-W G-W	eE iE iZE eZE F	9h33m46s 9 35 00 9 35 07 9 36 39 9 46 +	Weak
23	Mar. 5	G-W G-W G-W G-W	eZ eE eZ F	23h24m22s 23 35 24 23 37 01 23 59 +	Weak
24	Mar. 9	W-A W-A W-A W-A W-A W-A	ePn iPn iP* iSn iS* i	5h45m51s 5 45 52 5 46 02 5 46 52 5 47 06 5 47 41	$\Delta P_n - H = 5^{\circ}0$ $\Delta S_n - P_n = 5^{\circ}1$ $\Delta_{meas} = 5^{\circ}0$ $\phi = 40^{\circ}4$ N. $\lambda = 84^{\circ}2$ W. Considerable damage caused in region cen- tering at Anna, Ohio. H = 05h44m33s.
25	Mar. 9	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	ePNZ ipPNZ ePR <sub>1</sub> NEZ iN iZ ipPR <sub>1</sub> NEZ eNEZ iSNZ eSE esSEZ isSN iNE iSR <sub>1</sub> NE isSR <sub>1</sub> NE F	15h46m33s 15 46 41 15 47 25 15 47 26 15 47 27 15 47 36 15 51 14 15 51 20 15 51 20 15 51 37 15 51 38 15 52 09 15 52 46 15 53 15	$\Delta S - P = 28^{\circ}5$ $\Delta P - H = 28^{\circ}6$ $\Delta_{meas} = 28^{\circ}6$ H = 15h40m38s Depth approximately 50 Km. by Brunner Depth Chart Epicenter: Region of $\phi = 10^{\circ}6$ N, $\lambda = 33^{\circ}4$ W.
26	Mar. 10	G-W G-W	eE eE	5h19m17s 5 22 38	Weak
27	Mar. 12	G-W G-W G-W	eE eN e(M) <sub>N</sub>	10h38m16s 10 38 24 10 49.4	Weak

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
28	Mar. 14	G-W	iPNZ	12h06m32s	$\Delta S-P = 65^{\circ}3$ $\Delta_{meas} = 65^{\circ}3$ $\phi = 23^{\circ}8 S,$ $\lambda = 71^{\circ}0 W.$ Minor damage reported at Taltal, Chile. H = 11h56m01s Depth approximately 80 Km by Brunner Depth Chart. Lost in changing records.
		G-W	iz	12 06 43	
		G-W	ippNZ	12 06 48	
		G-W	en	12 15 04	
		G-W	enZ	12 15 08	
		G-W	eSN	12 15 13	
		G-W	in	12 15 19	
		G-W	issN	12 15 40	
		G-W	e(sS)Z	12 15 43	
		G-W	F		
29	Mar. 15	G-W	eZ	6h15m02s	Distant. Weak
		W-A	eE	6 15 03	
		W-A	eN	6 15 05	
		W-A	F	6 20 +	
30	Mar. 19	G-W	ePZ	18h23m05s	$\Delta S-P = 69^{\circ}3$ H = 18h12m01s Region off coast of Chile. Probably some- what deep. Lost in microseisms
		G-W	iNZ	18 23 06	
		G-W	eE	18 23 10	
		G-W	eSE	18 32 16	
		G-W W-A	iNE	18 32 17	
		G-W W-A	eEZ	18 32 17	
		G-W W-A	F		
31	Mar. 21	G-W	eE	17h06m20s	
		W-A	eE	17 08 36	
		G-W	eE	17 08 42	
		G-W	e(L)E	17 17.9	
		G-W	F	17 30 +	
32	Mar. 21	G-W	e(P)Z	19h42m13s	
		G-W	eZ	19 42 26	
		G-W	e(S)E	19 52 11	
		G-W	iE	19 52 50	
		G-W	eE	19 53 10	
		G-W	eE	20 18.6	
		G-W	F	20 49 +	
33	Mar. 23	G-W	e(P)Z	0h56m11s	
		G-W	eN	0 56 18	
		G-W	e(S)E	1 05 39	
		G-W	i(S)NE	1 05 51	
		G-W	eLE	1 16.1	
		G-W	eMN	1 24.6	
		G-W	F	2 05 +	
34	Mar. 23	G-W	e(L)E	19h25.1m	Lost in microseisms
		G-W	e(M)E	19 33.1	
		G-W	F		
35	Mar. 24	G-W	eE	1h32m43s	Lost in microseisms
		G-W	eNE	1 36 10	
		G-W	eLN	1 40.6	
		G-W	eLE	1 40.8	
		G-W	eMNE	1 43.2	
		G-W	F		



No.	Date	Inst.	Phase	G.M.C.T.	Remarks
36	Mar. 25	G-W	eP <sub>E</sub>	16h53m57s	$\Delta p-H = 21.8$ $\Delta_{meas} = 21.98$ $H = 16h49m04s$ $\rho = 33.4$ N. $\lambda = 116.7$ W. Reported felt in Los Angeles, San Diego, and adjacent area of southern California. Pasadena associates epicenter with San Jacinto fault
		G-W	iE	16 53 59	
		G-W	iz	16 54 00	
		G-W	eS <sub>N</sub>	16 58 01	
		G-W	e(S) <sub>N</sub>	16 58 06	
		G-W	i(S) <sub>N</sub>	16 58 06	
		G-W	iE	16 58 15	
		G-W	e(G) <sub>E</sub>	16 58 37	
		G-W	eL <sub>N</sub>	17 00 02	
		G-W	e(L) <sub>EZ</sub>	17 00 20	
G-W	F		Lost in microseisms		
37	Mar. 26	G-W	eNE	16h53.4m	Time doubtful
		G-W	eNE	16 56.4	
		G-W	F	17 10	
38	Mar. 26	W-A	eE	21h14m54s	Time doubtful
		G-W	eE	21 15 04	
		G-W	eE	21 19 38	
		G-W	eN	21 19 56	
		G-W	eM <sub>NE</sub>	21 24.0	
		G-W	eZ	21 25.0	
G-W	F	22 07 ±			
39	Mar. 29	G-W	eN	6h25m53s	Time doubtful
		G-W	eZ	6 26 03	
		G-W	eN	6 26 07	
		G-W	eN	6 29.6	
		G-W	F	7 06 ±	
40	Mar. 29	G-W	eP <sub>Z</sub>	7h59m26s	Possibly somewhat deep
		G-W	eN	7 59 27	
		G-W	eS <sub>Z</sub>	8 07 14	
		G-W	eN	8 07 15	
		G-W	iN	8 07 19	
		G-W	F	9 01 ±	

Minor Seismic Activity: Mar 1, 14h56m to 15h03m; Mar.4-5, 14h57m to 22h00m; Mar.6, 15h00m to 20h45m; Mar.9-10, 16h30m to 06h53m; Mar.11, 15h36m to 18h55m; Mar.12, 17h57m to 17h59m, Mar.13, 05h59m to 12h45m; Mar.13-14, 15h08m to 11h44m; Mar.14-15, 17h00m to 08h09m, Mar.16, 16h04m to 17h34m; Mar.17 16h00m to 22h34m; Mar. 18, 10h04m to 11h58m; Mar.19-20, 05h18m to 01h09m; Mar.20-21, 14h42m to 01h15m; Mar.22, 21h17m to 21h24m; Mar.23 15h36m to Mar.25 23h08m; Mar.25 6h00m to 13h14m; Mar.27, 16h49m to 22h25m; Mar.28, 15h48m to 15h50m; 16h46m to 18h47m; 19h12m to 19h22m; Mar.29 12h19m to 12h47m.

J. B. Macelwane, S. J.  
 Director

F. Robertson  
 Graduate Fellow



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No.	Date	Inst.	Phase	G. M. C. T.	Remarks
41	April 1	G-W	eSKS <sub>N</sub>	17h43m17s	$\Delta$ S-H = 91°4 Epicenter: Region Navigator Is. $\phi$ = 14.8 S $\lambda$ = 170°1 W. on basis of data of Manila, Chiufeng, and Apia. H = 17h20m28s
		G-W	eS <sub>E</sub>	17 44 30	
		G-W	e(SKKS) <sub>N</sub>	17 45 01	
		G-W	eL <sub>N</sub>	18 06.1	
		G-W	e(M) <sub>N</sub>	18 11.6	
		G-W	F	Lost in microseisms	
42	April 3	W-A	eNE	22h21m20s	Weak
		G-W	eN	22 21 21	
		W-A	iNE	22 21 34	
		G-W	eZ	22 21 44	
		G-W	eN	22 25 33	
		W-A	eE	22 25 42	
		G-W	eE	22 26 06	
		G-W	eL <sub>N</sub>	22 28.9	
		G-W	F	23 04 ±	
43	April 5	W-A	eE	6h55m48s	Lost in following shock
		W-A	eN	6 56 16	
		W-A	eE	6 59 26	
		G-W	iE	6 59 26	
		G-W	F		
44	April 5	G-W	eP <sub>Z</sub>	7h12m16s	$\Delta$ = 126°2 Epicenter region of 1°9 S, 133°7 E on basis of data of Manila, Phu- lein, Taihoku, Sydney, Chiufeng, Honolulu, and Wellington. H = 06h56m27s Possibly somewhat deep.
		G-W	eP <sub>Z</sub>	7 15 31	
		G-W	eE	7 16 22	
		G-W	eZ	7 17 16	
		G-W	eE	7 17 17	
		G-W	ePR <sub>1N</sub>	7 17 21	
		G-W	iE	7 17 21	
		G-W	e(SK <sub>P</sub> ) <sub>N</sub>	7 18 46	
		G-W	eZ	7 22 04	
		G-W	eN	7 22 24	
		G-W	e(SK <sub>S</sub> ) <sub>E</sub>	7 22 43	
		G-W	iPS <sub>E</sub>	7 27 20	
		G-W	iS <sub>N</sub>	7 27 21	
G-W	F	10 06 ±			
45	April 16	G-W	eZ	3h14m45s	This earthquake is being studied in de- tail by Reverend A. J. Westland, S.J.
		G-W	iZ	3 14 52	
		G-W	iNZ	3 14 56	
		G-W	eZ	3 16 13	
		G-W	iZ	3 16 18	
		G-W	iZ	3 16 27	
		G-W	iN	3 16 29	

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
45	April 16	G-W	iZ	3 18 49	
		G-W	iZ	3 18 58	
		G-W	iZ	3 19 08	
		G-W	iEN	3 25 01	
		G-W	iNE	3 25 38	
		G-W	iNE	3 26 07	
		G-W	eNE	3 27 41	
		G-W	iNE	3 28 31	
		G-W	iE	3 33 03	
		G-W	iN	3 33 06	
		G-W	iN	3 35 26	
		G-W	F	7 35 +	
46	April 19	W-A	(e)E	1h07m44s	Near quake?
		W-A	eNE	1 07 53	
		W-A	iN	1 07 55	
		W-A	iE	1 07 56	
		W-A	iE	1 07 57	
		W-A	F	1 09 +	
47	April 22	W-A	eE	22h50m24s	May not be of seismic origin.
		W-A	iN	22 50 35	
		W-A	iE	22 50 36	
		W-A	F	22 55 +	
48	April 25	G-W	eN	10h32m16s	Lost in microseisms
		G-W	eE	10 32 17	
		G-W	eN	10 37 24	
		G-W	eE	10 43 00	
		G-W	iE	10 43 18	
		G-W	iN	10 43 26	
		G-W	eMEN	10 53.7	
		G-W	F		
49	April 29	G-W	ePN	18h19m22s	$\Delta_{S-P} = 40^{\circ}3$ $\Delta_{meas} = 40^{\circ}3$ $H = 18h11m42s$ $\phi = 53^{\circ}4$ N. $\lambda = 34^{\circ}0$ W.
		G-W	ePRINE	18 20 57	
		G-W	iSE	18 25 36	
		G-W	iSN	18 25 37	
		G-W	iE	18 28 37	
		G-W	eE	18 34.2	
		G-W	eMNE	18 34.8	
		G-W	F	Lost in following shock.	
50	April 29	G-W W-A	iPNE	19h01m23s	$\Delta_{P-H} = 48^{\circ}9$ $\Delta_{meas} = 48^{\circ}9$ $H = 18h52m43s$ Depth approximately 40 Km. by the Brunner Depth Chart. $\phi = 53^{\circ}8$ N. $\lambda = 160^{\circ}5$ W.
		W-A	iE	19 01 28	
		W-A	ipPE	19 01 33	
		G-W	iE	19 01 42	
		G-W W-A	eSNE	19 08 26	
		G-W	esSNE	19 08 45	
		G-W	F	Lost in following shock	



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51	April 29	W-A W-A G-W G-W	eP <sub>E</sub> e(S) <sub>E</sub> i <sub>N</sub> F	20h30m53s 20 40 42 20 40 42 Lost in microseisms	

Minor Seismic Activity: April 1-2, 15h07m to 01h24m; April 2, 2h18m to 2h37m 5h52m to 6h06m, 7h27m to 7h47m, 13h26m to 13h54m 17h01m to April 3, 9h01m; April 4-5, 7h26m to 12h00m; April 5-6, 16h37m to 01h50m; April 6, 4h40m to 4h42m, 9h06m to 9h15m; April 7, 14h44m to April 8 2h00m; April 8, 11h06m to 12h24m; April 8-9, 15h17m to 3h51m; April 9 16h42m to 23h40m, April 10, 16h30m to 23h10m; April 11 5h53m to 6h22m; 18h35m to 18h47m; April 12, 8h52m to 12h43m; April 13, 5h19m to 5h47m, 22h27m to April 14, 12h01m; April 14-15, 15h08m to 19h02m; April 16-17, 12h08m to 23h01m; April 20-21, 14h43m to 7h38m; April 21-22, 15h00m to 6h20m; April 22-23, 14h58m to 4h08m; April 23-23, 14h38m to 4h09m; April 26, 15h13m to 15h47m, 19h13m to 21h21m, April 27, 15h10m to 22h27m; April 28, 7h41m to 7h48m; 14h38m to April 30 9h08m; April 30 14h50m to 23h37m.

J. B. Macelwane, S.J.  
Director

F. Robertson  
Graduate Fellow



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No.	Date	Inst.	Phase	G.M.C.T.	Remarks
52	May 1	G-W G-W G-W G-W G-W G-W G-W	iPZ eS <sub>E</sub> e <sub>N</sub> eL <sub>N</sub> eL <sub>E</sub> eM <sub>N</sub> eM <sub>E</sub> F <sub>E</sub>	12h32m47s 12 42 27 12 42 32 12 53.9 12 54.9 13 02.4 13 03.4 13 38 ±	
53	May 1	G-W G-W G-W G-W G-W G-W	ePNZ e(S) <sub>N</sub> e <sub>N</sub> Z e <sub>E</sub> (M) <sub>NEZ</sub> F	15h29m39s 15 33 30 15 34 08 15 34 13 15 37 25 16 39 ±	Phase not clearly defined $\Delta_{S-P} = 20^{\circ}8$ H = 15h24m57s
54	May 1 May 2	G-W G-W G-W G-W	e(L) <sub>N</sub> e <sub>Z</sub> e(M) <sub>NE</sub> F	23h55.0m 00 01.9 00 04.4 00 35 ±	Weak
55	May 4	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	iP <sub>EZ</sub> ePR <sub>IZ</sub> e <sub>N</sub> iP <sub>C</sub> P <sub>NEZ</sub> iPR <sub>2NEZ</sub> e <sub>NE</sub> e(S) <sub>N</sub> eS <sub>Z</sub> i(SR <sub>1</sub> ) <sub>NE</sub> i <sub>NE</sub> e(G) <sub>E</sub> eL <sub>NE</sub> eM F	05h16m56s 05 18 29 05 18 40 05 18 49 05 18 54 05 23 24 05 23 31 05 23 32 05 23 38 05 26 43 05 26 48 05 30.0 05 32.6 07 02 ±	$\Delta_{S-P} = 43^{\circ}6$ $\Delta_{P-H} = 43^{\circ}6$ $\Delta_{meas} = 43^{\circ}7$ $\phi = 59^{\circ}4$ N. $\lambda = 152^{\circ}9$ W. H = 05h08m53s
56	May 8	W-A G-W G-W G-W G-W G-W	e <sub>E</sub> e <sub>Z</sub> e <sub>N</sub> e <sub>E</sub> e <sub>N</sub> F	20h04m52s 20 04 55 20 09 42 20 09 43 20 13 58 20 34 ±	Time doubtful  Weak

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
57	May 9	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	iP <sub>Z</sub> eP <sub>C</sub> PZ eN <sub>Z</sub> eE <sub>N</sub> eS <sub>E</sub> iS <sub>N</sub> eL <sub>N</sub> eL <sub>Z</sub> eM <sub>N</sub> eM <sub>Z</sub> F	14h58m58s 14 59 01 15 08 54 15 09 00 15 09 06 15 09 12 15 28.2 15 28.3 15 30.7 15 30.9 17 21 ±	$\Delta_{S-P} = 80^{\circ}5$ $\Delta_{P-H} = 80^{\circ}3$ $\Delta_{meas} = 80^{\circ}5$ $H = 14h46m50s$ $\phi = 45^{\circ}.7$ N. $\lambda = 149^{\circ}0$ E. On basis of data of Manila, Chiu- feng, Helwan, Zurich
58	May 12	G-W W-A G-W G-W G-W G-W G-W G-W	eP <sub>Z</sub> E iZ eE eN eE e(L) <sub>E</sub> Z F	03h04m57s 03 04 58 03 14 43 03 14 52 03 24 19 03 48.5 05 11 ±	Weak Possibly somewhat deep.  According to Chuifeng $\phi = 3^{\circ}.5$ S. $\lambda = 142^{\circ}.5$ E
59	May 12	W-A W-A W-A G-W W-A W-A G-W G-W G-W W-A W-A	eP <sub>E</sub> iN iE iS <sub>E</sub> iN iN eZ iZ iF F	22h57m19s 22 57 19 22 57 23 22 57 25 22 57 26 22 57 27 22 57 27 22 57 28 22 57 28 22 59 ±	Probably a near earthquake
60	May 13	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	eP <sub>NE</sub> Z iZ iE iN <sub>Z</sub> eN eE eZ eM <sub>E</sub> eM <sub>E</sub> F <sub>I</sub> N	09h23m43s 09 23 45 09 23 47 09 25 20 09 28 04 09 28 16 09 28 17 09 28 18 09 31.2 09 31.4 09 58 ±	Weak
61	May 13	G-W G-W G-W G-W G-W	e(P) <sub>Z</sub> iN <sub>Z</sub> e(S) <sub>N</sub> iN F	21h03m40s 21 03 42 21 08 03 21 08 07 21 08 07	Beginning phases masked by micro- seisms No surface waves (Lost in microseisms)

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No.	Date	Inst	Phase	G.M.C.T.	Remarks
62	May 15	G-W G-W G-W	eL <sub>E</sub> eL <sub>N</sub> F	08h33.9m 08 36.4 08 42 ±	Faint
63	May 15	G-W G-W G-W G-W G-W	e <sub>N</sub> e <sub>E</sub> eL <sub>E</sub> eL <sub>N</sub> F	10h46m11s 10 46 14 11 02.1 11 02.4 11 08 ±	Weak
64	May 16	G-W G-W G-W G-W	e <sub>E</sub> e <sub>N</sub> eM <sub>E</sub> F <sub>E</sub>	12h02m58s 12 05 00 12 32.0 12 38 ±	Vertical not in operation. Time doubtful.
65	May 17	W-A W-A W-A W-A W-A W-A W-A W-A W-A W-A G-W G-W W-A	eP <sub>n</sub> i(P <sub>n</sub> ) <sub>N</sub> e <sub>E</sub> i <sub>N</sub> i <sub>NE</sub> i <sub>NE</sub> i <sub>Sn</sub> i <sub>E</sub> i <sub>N</sub> iS* e <sub>N</sub> i <sub>N</sub> F	00h50m31.6s 00 50 31.9 00 50 32.8 00 50 34.2 00 50 36.2 00 50 37.2 00 51 06.2 00 51 06.7 00 51 06.9 00 51 12.2 00 51 13.7 00 51 27.7 01 01 ±	$\Delta_{Sn} - P_n = 2^{\circ}8$ = 195 mi. = 312 km. H = 00h49m46.4s $\phi = 35^{\circ}9$ N. $\lambda = 90^{\circ}4$ W.
66	May 18	G-W G-W G-W G-W G-W	eZ e <sub>N</sub> e <sub>E</sub> e <sub>N</sub> e <sub>Z</sub> F	12h05m33s 12 05 36 12 06 01 12 19 30 12 19 31 13 04 ±	Weak
67	May 19	W-A G-W W-A G-W W-A G-W W-A	iP <sub>NE</sub> i <sub>E</sub> i <sub>E</sub> i <sub>EZN</sub> i <sub>E</sub> i <sub>E</sub> F	20h22m45s 20 22 46 20 22 47 20 22 48 20 22 48 20 22 50 20 24 ±	Near quake or blast.



No.	Date	Inst.	Phase	G.M.C.T.	Remarks
68	May 21	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	iP <sub>Z</sub> e <sub>Z</sub> i <sub>Z</sub> e <sub>Z</sub> e <sub>FR<sub>3Z</sub></sub> i(S <sub>CP</sub> ) <sub>E</sub> e(S) <sub>Z</sub> i <sub>E</sub> e(SR <sub>1</sub> ) <sub>E</sub> eSR <sub>2Z</sub> F	13h19m35s 13 20 04 13 20 06 13 21 33 13 21 41 13 25 20 13 25 41 13 25 58 13 27 57 13 28 18 14 06 ±	Near normal depth $\phi = 2.3$ N. $\lambda = 78.5$ W. $H = 13h12m17s$ Epicenter based on data of San Juan, Huancayo, Weston, Philadelphia, Little Rock, and St. Louis. $\Delta_{P-H} = 37.8$ $\Delta_{meas} = 37.9$
69	May 23	G-W G-W G-W	e <sub>N</sub> e <sub>LE</sub> F	08h32m53s 08 47.5 08 50 ±	Faint
70	May 23	G-W W-A G-W G-W G-W G-W G-W G-W	e(P) <sub>NEZ</sub> e <sub>Z</sub> e(S) <sub>NE</sub> i <sub>N</sub> i <sub>E</sub> e <sub>Z</sub> F	18h43m42s 18 44 06 18 47 59 18 48 40 18 48 46 18 48 53 19 00 ±	Weak According to St. Louis $h = 100$ km. by Brunner Depth Chart Foreshock of No. 74
71	May 24	G-W W-A G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	e(P) <sub>NZ</sub> e <sub>E</sub> e <sub>N</sub> e <sub>N</sub> e <sub>Z</sub> i <sub>N</sub> e <sub>N</sub> i <sub>N</sub> i(S) <sub>E</sub> e <sub>LN</sub> e <sub>ME</sub> F	00h47m39s 00 47 41 00 48 51 00 49 05 00 49 08 00 49 08 00 50 06 00 50 25 00 53 25 00 57.9 01 00.4 01 31 ±	Weak Possibly somewhat deep Probably a fore- shock of No. 74.
72	May 25	G-W G-W G-W G-W G-W G-W	e <sub>N</sub> e <sub>Z</sub> e <sub>N</sub> e <sub>Z</sub> e <sub>N</sub> F	23h08m37s 23 08 51 23 10 31 23 18 55 23 18 59 23 37 ±	Weak
73	May 26	G-W G-W G-W	e <sub>N</sub> e <sub>N</sub> F	03h46m57s 03 54.6 04 41 ±	Weak

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
74	May 28	W-A W-A W-A W-A W-A W-A W-A W-A	iPNE iNE iN i(S)E e(S)N eLE eLN F	15h40m37s 15 40 39 15 40 43 15 44 39 15 44 42 15 45 18 15 45 37 16 00 ±	G-W not in operation. According to St. Louis, h = 120 km. by Brunner Depth Chart. ΔS-P = 2391 H = 15h35m43s Region Acapulco Deep
75	May 28	G-W G-W G-W G-W W-A W-A G-W W-A G-W G-W G-W G-W G-W G-W G-W G-W G-W	eZ iZ eZ iZ iE eE iNE eNE eE iN eE iNE eLNE eMNEZ F	20h10m55s 20 10 57 20 13 09 20 13 11 20 13 11 20 13 14 20 18 42 20 19 19 20 19 44 20 19 45 20 22 16 20 22 24 20 42.9 20 46.4 (Lost in following earthquake)	Probably somewhat deep
76	May 28	G-W W-A G-W G-W G-W G-W W-A G-W G-W G-W G-W	eEZ eE eNEZ iE eN eZ eE iN iZ eZ F	20h38m27s 20 38 28 20 42 55 20 43 03 20 46 14 20 46 28 20 46 38 20 46 38 20 47 55 20 48 31 21 32 ±	Aftershock of No. 75.

Minor Seismic Activity:

May 2, 1h52m to 2h03m; May 2-3, 4h27m to 6h38m; May 3, 9h56m to 22h31m; May 4, 14h55m to 21h21m; May 5, 18h45m to 22h15m; May 6, 7h58m to 9h54m; May 7, 14h33m to 15h25m, 22h43m to 22h50m; May 10, 14h58m to 23h02m, May 11, 12h28m to May 12, 21h11m; May 13-14, 15h00m to 01h00m; May 14, 4h28m to 6h20m; May 15-16, 16h00m to 9h17m; May 16-17, 15h41m to 0h23m; May 17, 23h31m to 23h56m; May 18-21, 14h02m to 6h11m, May 21, 10h43m to 13h00m, May 21-22, 14h36m to 01h01m, May 22, 14h31m to 23h31m; May 23, 7h10m to 7h44m; May 24, 19h49m to 21h41m; May 25, 5h47m to 5h35m, 13h05m to 17h04m, May 26, 16h37m to 21h07m; May 26, 23h03m to 23h11m; May 27, 5h01m to 7h06m, 14h40m to 23h47m; May 28, 9h27m to 9h50m; May 30, 14h54m to 22h50m; May 31, 20h18m to 22h53m.

T. B. Macelwane, S.J.  
Director

Florence Robertson  
Graduate Fellow



**FLORISSANT****SEISMOGRAPHIC STATION, ST. LOUIS UNIVERSITY, ST. LOUIS, MO., U. S. A.**

Three Galitzin-Wilip, two Wood-Anderson short-period seismographs, Shortt synchronome clock

Bulletin for 1937

17.

No.	Date	Inst.	Phase	G. M. C. T.	Remarks
77	June 2	G-W W-A G-W G-W G-W G-W G-W G-W W-A	e(P) <sub>E</sub> e <sub>E</sub> e <sub>E</sub> i <sub>N</sub> e(S) <sub>N</sub> e <sub>NE</sub> e <sub>E</sub> e <sub>MNE</sub> e(M) <sub>E</sub> F	21 <sup>h</sup> 09 <sup>m</sup> 28 <sup>s</sup> 21 09 35 21 10 05 21 10 24 21 13 54 21 13 59 21 14 27 21 16.8 21 17.3	Vertical component not in operation Normal weak       Lost in microseisms
78	June 7	W-A W-A W-A W-A W-A W-A W-A W-A W-A	iP <sub>N</sub> i <sub>N</sub> e <sub>E</sub> iS <sub>NE</sub> i <sub>E</sub> i <sub>N</sub> i <sub>NE</sub> i <sub>N</sub> F	23 <sup>h</sup> 47 <sup>m</sup> 47 <sup>s</sup> 23 47 52 23 47 56 23 47 57 23 47 59 23 48 02 23 48 05 23 48 15 23 50 ±	Near earthquake or blast.
79	June 8	W-A W-A W-A W-A W-A W-A W-A W-A W-A	eP <sub>nN</sub> eP* <sub>NE</sub> eP <sub>GN</sub> e <sub>E</sub> eS <sub>NE</sub> i <sub>E</sub> iS* <sub>E</sub> iS <sub>GE</sub> F	0 <sup>h</sup> 24 <sup>m</sup> 14 <sup>s</sup> 0 24 17 0 24 26 0 24 33 0 24 41 0 24 42 0 24 44 0 24 48 0 31 ±	Near earthquake in region of New Madrid $\Delta S_n - P_n = 2.15$
80	June 8	G-W G-W G-W G-W G-W G-W G-W G-W	iP <sub>NEZ</sub> i <sub>N</sub> iP <sub>PEZ</sub> i(PR1) <sub>Z</sub> eP <sub>CPZ</sub> eS <sub>NE</sub> es <sub>NE</sub> F	22 <sup>h</sup> 34 <sup>m</sup> 30 <sup>s</sup> 22 34 59 22 35 07 22 35 15 22 38 15 22 38 22 22 39 27 24 24 ±	$\Delta P-H = 22.6$ $\Delta S-P = 22.6$ $\Delta_{meas} = 22.6$ H = 22 <sup>h</sup> 29 <sup>m</sup> 45 <sup>s</sup> h = 200 km. on basis of Brunner Depth Chart. Epicenter: $\phi = 16.3^\circ N, \lambda = 92.7^\circ W.$ This replaces $\phi = 14.7^\circ N, \lambda = 92.6^\circ W.$ as given in the Pre- liminary Bulletin 12



No.	Date.	Inst.	Phase	G.M.C.T.	Remarks
81	June 13	G-W G-W W-A G-W G-W G-W G-W G-W G-W G-W G-W	ePZ iPNEZ ipPZ ePR1Z eSN eSZ isSNZ eLN eMZ F	23h29m07s 23 29 09 23 29 14 23 29 35 23 33 25 23 33 26 23 33 32 23 39 + 23 39.8 Lost in microseisms	Epicenter region $\phi = 15^{\circ}0' N.$ $\lambda = 98^{\circ}0' W.$ According to St. Louis $H = 23h23m53s$ $\Delta S-P = 23^{\circ}7'$ $\Delta_{meas} = 23^{\circ}8'$ Depth nearly normal
82	June 18	G-W G-W G-W G-W G-W G-W G-W	ePEZ eN eSZ iSN eMZ eME F	9h12m27s 9 19 15 9 19 30 9 19 30 9 21.6 9 22.1 9 52 +	
83	June 19	G-W G-W G-W G-W G-W	eSKSE eNE eN e(S)E e(S)W F	17h30m11s 17 31 08 17 31 49 17 34.8 17 35 58 Lost in microseisms	Deep focus, distant Weak. On the basis of Wellington, Chiufeng, Adelaide and Florissant pro- bably region South Fiji and North of Kermadec Islands
84	June 21	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	iPNZ ipPNZ iPcP iPR1 iPR2 iPR3 iScP iS isS iSP iSR1 isSR1 iL iM F	15h21m40s 15 21 49 15 23 24 15 23 35 15 24 26 15 24 50 15 27 08 15 28 34 15 28 50 15 28 53 15 31 46 15 32 22 15 35 53 15 40 12 Lost in microseisms	$\Delta P-H = 46^{\circ}7'$ $\Delta_{meas} = 46^{\circ}7'$ $H = 15h13m17s$ Depth by Brunner Dept Chart approximately 50 km. $\phi = 6^{\circ}8' S, \lambda = 79^{\circ}9' W$ Reported felt along western coast of Peru Some damage to coasta cities particularly Trujillo, 300 miles northwest of Lima.
85	June 22	W-A W-A W-A W-A W-A	eN iN eE iE F	23h45m21s 23 45 29 23 45 34 23 45 37 23 48 +	Near earthquake or blast
86	June 23	W-A W-A W-A	iNE iE F	15h44m21s 15 44 24 15 46 +	Near earthquake Reported felt in Tiptonville, Tenn.



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No.	Date	Inst.	Phase	G.M.C.T.	Remarks
87	June 24	G-W G-W G-W G-W	eN eZ eT F	3h36m21s 3 37.6 3 39.1 4 24 +	Weak
88	June 24	G-W G-W G-W	iPZ ePR1Z e(S)Z F	13h17m56s 13 18 52 13 23 04 Lost in following earthquake	$\Delta P-H = 30^{\circ}8$ $\Delta_{\text{meas}} = 31^{\circ}0$ $H = 13h11m36s$ $\phi = 891 N$ $\lambda = 84^{\circ}2 W$ Depth normal
89	June 24	G-W G-W G-W G-W	iPZ ePR1Z eSE F	13 19 29 13 20 36 13 24 56 Lost in changing records.	Aftershock of No. 88. $\phi = 8^{\circ}1 N$ , $\lambda = 84^{\circ}2 W$ . $\Delta P-H = 30^{\circ}8$ $\Delta_{\text{meas}} = 31.0$ Depth normal. $H = 13h13m29s$
90	June 24	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	iPEZ iPR1EZ iPcPZ ePcPN iPcPE ePR2E eZ eScPE eSNZ eSR1N eLE eMNEZ F	20 08 01 20 09 42 20 09 52 20 09 54 20 09 55 20 10 15 20 10 18 20 13 40 20 14 31 20 17 40 20 21.2 20 22.8 Lost in microseisms	Region: $\phi = 36^{\circ} N$ , $\lambda = 36^{\circ} W$ , $H = 20h00m05s$ $\Delta S-P = 42^{\circ}6$

Minor Seismic Activity:

June 1, 13h59m to 14h35m; 21h17m to 22h09m: June 2, 01h44m to 01h56m: June 3, 01h02m to 01h23m: June 4, 14h37m to 21h20m: June 5 00h00m to 01h07m; 04h55m to 12h30m; 16h49m to 23h59m: June 6, 01h55m to 04h46m; 14h45m to 23h48m: June 8, 04h33m to 06h14; 15h09m to 23h 57m; June 9, 10h23m to 23h32m: June 10, 02h02m to 13h30m: June 13, 02h 30m to 15h23m: 16h12m to June 15, 00h59m: June 15, 16h49m to 23h15m: June 16, 14h33m to 22h18m: June 19, 15h47m to 23h19m: June 20, 14h33m to 23h59m: June 21, 03h35m to 12h46m: June 21-22, 21h33m to 01h12m: June 23, 01h01m to 01h25m: June 23-24, 14h33m to 00h09m: June 24, 15h18m to 23h59m: June 25, 02h55m to 04h32m: June 28, 19h44m to 21h 55m: June 29, 00h47m to 01h00m: June 29-30 14h51m to 01h03m: June 30, 04h18m to 08h04m; 15h34m to 23h01m.

James B. Macelwane, S.J.  
Director

F. Robertson  
Graduate Fellow



# FLORISSANT

## SEISMOGRAPHIC STATION, ST. LOUIS UNIVERSITY, ST. LOUIS, MO., U. S. A.

Three Galitzin-Wilip, two Wood-Anderson short-period seismographs, Shortt synchronome clock

Bulletin for July, 1937

20.

No.	Date	Inst.	Phase	G. M. C. T.	Remarks
91	July 1	G-W	ePEZ	6 <sup>h</sup> 08 <sup>m</sup> 09 <sup>s</sup>	
		G-W	eSN	6 10 11	
		G-W	eNE	6 10 19	
		G-W	eLNE	6 12.3	
		G-W	eLNE F	6 13.1 7 06 +	
92	July 2	W-A	ePN	0 <sup>h</sup> 15 <sup>m</sup> 42 <sup>s</sup>	Near quake or blast.
		W-A	iNE	0 15 45	
		W-A	iNE	0 15 47	
		W-A	iNE	0 15 49	
		W-A	F	0 17 +	
93	July 2	G-W	(e)Z	2 <sup>h</sup> 51 <sup>m</sup> 15 <sup>s</sup>	Epicenter after Saint Louis: Region of 14 <sup>o</sup> 5 S. 168 <sup>o</sup> .1 E.  H = 2 <sup>h</sup> 37 <sup>m</sup> 16 <sup>s</sup>  Depth nearly normal.  $\Delta_{P-H} = 107^{\circ}3$ $\Delta_{meas} = 107^{\circ}9$
		G-W	ePZ	2 51 36	
		G-W	eE	2 51 50	
		G-W	ePR <sub>1</sub> Z	2 55 55	
		G-W	eE	2 56 03	
		G-W	eZ	2 56 25	
		G-W	eSKSE	3 02 12	
		G-W	e(PS)Z	3 05 31	
		G-W	eE	3 05 33	
		G-W	iE	3 05 52	
		G-W	eE	3 10.9	
		G-W	eLE	3 26.9	
		G-W	eLZ	3 27.4	
		G-W	eME	3 30.9	
		G-W	eMZ	3 32.9	
G-W	F	5 36 +			
94	July 4	G-W	(e)Z	6 11 21	Epicenter: Region of 11 <sup>o</sup> 0 S, 163 <sup>o</sup> 0 E.  H = 5 <sup>h</sup> 55 <sup>m</sup> 20 <sup>s</sup>  Depth normal  $\Delta = 110^{\circ}$
		G-W	eE	6 13 56	
		G-W	e(PR <sub>1</sub> )Z	6 14 12	
		G-W	eEZ	6 14 30	
		G-W	eN	6 14 32	
		G-W	eSKSE	6 20 24	
		G-W	e(SKKS)N	6 21 41	
		G-W	e(S)N	6 22 05	
		G-W	eE	6 23 16	
		G-W	ePSE	6 23 44	
		G-W	eZ	6 23 47	
		G-W	iE	6 23 55	
		G-W	eZ	6 24 02	
G-W	eE	6 29 28			
G-W	eE	6 29 36			

No.	Date	Inst.	Phase	G.M.C.T.	Remarks			
94	July 4 (con't.)	G-W	eNE	6 29 38				
		G-W	eSR <sub>1</sub> E	6 29 56				
		G-W	eN	6 33 44				
		G-W	eN	6 40 31				
		G-W	eE	6 46 43				
		G-W	F	11 59 +				
		95	July 5	G-W		(e)N	1 <sup>h</sup> 48 <sup>m</sup> 53 <sup>s</sup>	
G-W	eZ			1 48 57				
G-W	eZ			1 50 23				
G-W	eZ			1 54 52				
G-W	eN			1 54 58				
G-W	eN			1 57 42				
G-W	eZ			1 58 24				
G-W	eN			2 01 01				
G-W	eZ			2 01 34				
G-W	eN			2 02 00				
G-W	eNE			2 02 10				
G-W	eE			2 02 30				
G-W	iN			2 02 35				
G-W	iE			2 03 06				
G-W	eN			2 04 24				
G-W	eZ			2 04 43				
G-W	eZ			2 05 49				
G-W	cN			2 06 52				
G-W	F			2 39 +				
96	July 8	G-W	e(P)Z	12 <sup>h</sup> 58 <sup>m</sup> 18 <sup>s</sup>				
		G-W	eZ	12 58 46				
		G-W	e(PR <sub>1</sub> )Z	12 59 21				
		G-W	eZ	12 59 35				
		G-W	e(S)Z	13 04 01				
		G-W	F	Lost in changing records				
97	July 9	G-W	(e)Z	17 <sup>h</sup> 37 <sup>m</sup> 04 <sup>s</sup>				
		G-W	iNZ	17 37 05				
		W-A	iE	17 37 05				
		G-W	iE	17 37 06				
		W-A	iN	17 37 06				
		G-W	eZ	17 38 06				
		G-W	eE	17 44 25				
		W-A	iNE	17 44 34				
		W-A	eSE	17 46 33				
		W-A	iNE	17 46 34				
		W-A	F	Lost in microseisms				
		98	July 11	G-W		iPNZ	17 24 42	Clock stopped Epicenter: $\phi = 20^{\circ}7' N,$ $\lambda = 108^{\circ}03' W.$
				G-W		i(PR <sub>1</sub> )Z	17 25 05	
G-W	i(PR <sub>2</sub> )Z			17 25 34				
G-W	iN			17 25 35				
G-W	iSE			17 29 00				



No	Date	Inst.	Phase	G.L.C.T.	Remarks
98	July 11 con't.	G-W	iSN	17 29 02	H = 17 <sup>h</sup> 19 <sup>m</sup> 31 <sup>s</sup> Depth probably normal $\Delta_{S-P} = 23^{\circ}8$ $\Delta_{P-H} = 23^{\circ}6$ $\Delta_{mcas} = 23^{\circ}7$
		G-W	eZ	17 29 07	
		G-W	eZ	17 29 28	
		G-W	cLN	17 30.4	
		G-W	iz	17 31 45	
		G-W	cMN	17 31.9	
		G-W	F	17 47 ±	
99	July 14	W-A	ePE	4 21 37	Aftershock of # 98?          Lost in microseisms
		W-A	eZ	4 21 10	
		G-W	(o)Z	4 21 14	
		W-A	eE	4 21 47	
		G-W	(o)Z	4 21 56	
		G-W	eZ	4 22 15	
		W-A	eE	4 23 25	
		G-W	e(S) <sub>NE</sub>	4 25 28	
		G-W	eZ	4 25 30	
		G-W	eE	4 25 28	
		G-W	i <sub>NE</sub>	4 28 38	
		G-W	F		
100	July 15	W-A	eE	19 14 32	
		G-W	(o)Z	19 14 34	
		G-W	eZ	19 15 06	
		G-W	iNEZ	19 15 07	
		G-W	eNE	19 23 31	
		G-W W-A	iNE	19 23 34	
		G-W	eE	19 24 18	
		G-W	eE	19 25 16	
		G-W	F	20 43 ±	
101	July 18	G-W W-A	i(P)EZ	1 10 20	
		G-W	iN	1 10 21	
		W-A	e(S) <sub>E</sub>	1 17 36	
		W-A G-W	eNEZ	1 17 38	
		G-W	eN	1 18 02	
		G-W	F	1 59 ±	
102	July 19	G-W	(e) <sub>E</sub>	3 11 03	
		G-W	eZ	3 13 29	
		G-W	eE	3 13 32	
		G-W	eE	3 13 56	
		G-W	eE	3 19 17	
		G-W	eE	3 20 31	
		G-W	eE	3 23 21	
		G-W	eE	3 29.5	
		G-W	eZE	3 29 58	
		G-W	eN	3 34.6	
		G-W	eE	3 49.1	
		G-W	eLZE	3 53.1	
		G-W	cM <sub>MEZ</sub>	3 53.1	
		G-W	F	8 06 ±	





No.	Date	Inst.	Phase	G. L. C. T.	Remarks
106	July 26 (con't.)	G-W G-W G-W G-W G-W	iS <sub>E</sub> iN e <sub>E</sub> e <sub>N</sub> F	20 <sup>h</sup> 20 <sup>m</sup> 20 <sup>s</sup> 20 20 21 20 26 18 20 26 19 22 57 +	
107	July 30	W-A W-A W-A W-A W-A W-A	(e) <sub>E</sub> e <sub>E</sub> e <sub>E</sub> e <sub>E</sub> e <sub>E</sub> F	13 <sup>h</sup> 40 <sup>m</sup> 00 <sup>s</sup> 13 40 03 13 40 08 13 42 05 13 43 01 Lost in changing records	
108	July 31	G-W G-W G-W G-W G-W G-W G-W G-W G-W	eZ e <sub>E</sub> e <sub>E</sub> eZ e <sub>E</sub> eL <sub>E</sub> eM <sub>E</sub> eM <sub>Z</sub> F	20 <sup>h</sup> 54 <sup>m</sup> 07 <sup>s</sup> 20 59 49 21 00 29 21 01 37 21 08 35 21 20.9 21 29.4 21 34.4 23 40 +	

Minor Seismic Activity:

July 1, 10h19m to 14h23m; 14h55m to 15h55m: July 2-3, 14h00m to 02h47m: July 3, 05h36m to 06h20m; 14h00m to 21h24m: July 4, 23h08m to July 5 00h46m: July 6, 16h00m to 24h00m: July 7-8, 16h19m to 00h18m: July 8-9, 14h58m to 01h26m: July 9, 18h00m to 22h00m: July 10, 20h40m to 23h33m: July 11-12, 22h00m to 01h50m: July 12, 18h50m to 19h50m: July 12-13, 23h44m to 01h29m: 03h42m to 07h27m: July 13-14, 05h40m to 3h56m: July 14-15, 14h53m to 13h02m; July 15, 14h42m to 18h51m: July 16, 6h11m to 12h23m; 16h17m to 20h51m: 23h21m to July 17, 02h49m: July 17, 19h29m to 19h52m: July 19, 8h52m to 13h04m: July 22, 13h29m to 14h19m: July 23, 14h12m to 18h24m: July 24, 00h07m to 00h42m; 09h08m to 10h04m; 14h30m to July 25, 03h24m; July 25, 06h46m to 12h45m; 15h30m to July 26, 11h56m: July 26, 18h08m to 19h56m: July 28, 09h44m to 09h58m: July 30, 15h00m to July 31, 00h21m:

J. B. Macelwane, S. J.  
Director

F. Robertson  
Graduate Fellow

# FLORISSANT

## SEISMOGRAPHIC STATION, ST. LOUIS UNIVERSITY, ST. LOUIS, MO., U. S. A.

Three Galitzin-Wilip, two Wood-Anderson short-period seismographs, Shortt synchronome clock

Bulletin for August, 1937

25.

No.	Date	Inst.	Phase	G.L.C.T.	Remarks
109	Aug. 2	G-W	ePZ	15 <sup>h</sup> 57 <sup>m</sup> 29 <sup>s</sup>	
		G-W	ePNE	15 57 30	
		G-W	eNZ	15 57 47	
		G-W	eSNEZ	16 07 06	
		G-W	eN	16 07 28	
		G-W	eE	16 07 31	
		G-W	eME	16 25.2	
		G-W	eE	16 27.3	
		G-W	F	Lost in microseisms	
110	Aug. 3	G-W	ePZ	21 <sup>h</sup> 59 <sup>m</sup> 55 <sup>s</sup>	
		G-W	eN	22 00 00	
		G-W	eSE	22 04 12	
		G-W	eSNZ	22 04 13	
		G-W	iN	22 04 17	
		G-W	eZ	22 04 39	
		G-W	F	Lost in microseisms	
		G-W			
111	Aug. 4	G-W	ePZ	23 54 38	Surface
		G-W	eZ	23 55 11	
		G-W	(e)PZ	23 57 05	
		G-W	eN	23 57 08	
		G-W	eZ	23 57 10	
		G-W	ePR <sub>1</sub> Z	23 57 55	
		G-W	eN	23 58 09	
		G-W	eE	24 50.8	
		G-W	eN	24 51.3	
		G-W	eMNZ	25 03.3	
		G-W	F	25 38 +	
		112	Aug. 5	G-W	
G-W	eN			14 57 44	
G-W	eZ			14 57 58	
G-W	ePR <sub>1</sub> Z			15 03 12	
G-W	eZ			15 03 36	
G-W	eE			15 03 37	
G-W	eN			15 11 20	
G-W	eN			15 12 06	
G-W	eN			15 13.4	
G-W	eN			15 14 00	
G-W	eE			15 14 12	
G-W	F			Lost in microseisms	



## Borissant Bulletin for August, 1937

No.	Date	Inst.	Phase	G.L.C.T.	Remarks
113	Aug. 5	W-A W-A W-A W-A W-A	iPN eE iS <sub>NE</sub> iM <sub>E</sub> F	21 <sup>h</sup> 31 <sup>m</sup> 52 <sup>s</sup> 21 31 53 21 31 58 21 32 00 21 34 ±	Reported felt in South Saint Louis
114	Aug. 5	W-A W-A W-A W-A	iPN iE iS <sub>NE</sub> F	23 <sup>h</sup> 12 <sup>m</sup> 51 <sup>s</sup> 23 12 53 23 13 03 23 15 ±	Reported felt in Granite City, Illinois
115	Aug. 6	W-A W-A W-A W-A	ePN eSE eN F	22 <sup>h</sup> 03 <sup>m</sup> 43 <sup>s</sup> 22 03 47 22 03 48 22 05 ±	Near earthquake or blast
116	Aug. 11	W-A W-A W-A W-A	iPN iN iE F	1 <sup>h</sup> 14 <sup>m</sup> 09 <sup>s</sup> 1 14 18 1 14 22 1 26 ±	
117	Aug. 15	G-W G-W G-W G-W G-W	(e)PE (e) <sub>NZ</sub> e(S) <sub>N</sub> eZ F	0 <sup>h</sup> 26 <sup>m</sup> 54 <sup>s</sup> 0 26 59 0 30 12 0 30 14 Lost in microseisms	Weak.
118	Aug. 19	W-A W-A W-A	(e)E iN iNE	18 <sup>h</sup> 30 <sup>m</sup> 09 <sup>s</sup> 18 30 11 18 30 12	Near earthquake or blast. Time doubtful.
119	Aug. 20	G-W G-W G-W G-W G-W G-W	iZ iZ eE iZ eN F	7 <sup>h</sup> 44 <sup>m</sup> 31 <sup>s</sup> 7 45 04 7 45 22 7 48 45 7 49.0 Lost in microseisms.	Weak. Time doubtful.
120	Aug. 20	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	e(P')Z e(PR <sub>1</sub> )Z eN iZ eN eE iZ eE iN e(SKS)N iN	12 <sup>h</sup> 18 <sup>m</sup> 28 <sup>s</sup> 12 19 42 12 19 44 12 19 56 12 20 00 12 20 05 12 20 30 12 22 36 12 27 00 12 28 03 12 28 06	Time doubtful. Beginning phases masked by microseisms. Epicenter according to Manila:  φ = 14°2 N. λ = 122°1 E.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
120	Aug. 20 (con't.)	G-W	eN	12 28 49	H = 11h59m32s Felt throughout southern Luzon and neighboring Islands  Lost in changing records.
		G-W	i(PS)N	12 29 05	
		G-W	eN	12 30 00	
		G-W	iN	12 32 06	
		G-W	G?	12 34.4	
		G-W	iX?N	12 35.6	
		G-W	F		

Minor Seismic Activity:

Aug. 1, 10h15m to 23h37m: Aug. 2-3, 17h00m to 00h43m: Aug. 3-4, 18h00m to 09h00m: Aug. 5, 14h57m to 22h38m: Aug. 6, 14h58m to 24h00m: Aug. 7, 16h00m to 23h55m: Aug. 8-9, 20h42m to 04h33m: Aug. 9, 15h21m to 16h07m: Aug. 11, 23h00m to Aug. 12, 04h00m: Aug. 14-15, 14h30m to 01h15m: Aug. 15, 04h48m to 06h10m: 17h00m to 23h42m: Aug. 16, 10h55m to 11h02m: 17h31m to 18h31m: 20h38m to 21h09m: Aug. 17, 17h30m to 18h15m: 20h36m to 21h11m: Aug. 19, 15h00m to Aug. 20, 01h00m: Aug. 20, 15h00m to 22h10m: Aug. 21, 23h25m to Aug. 22, 00h39m: Aug. 23-24, 15h39m to 00h22m: Aug. 24-25, 22h30m to 00h10m: Aug. 26-27, 19h19m to 00h37m: Aug. 28, 15h52m to 22h48m: Aug. 30, 21h23m to 23h33m: Aug. 31, 00h00m to 00h05m: 03h00m to 05h00m: 14h00m to 23h00m:

J. B. Macelwane, S. J.  
Director

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# FLORISSANT

## SEISMOGRAPHIC STATION, ST. LOUIS UNIVERSITY, ST. LOUIS, MO., U. S. A.

Three Galitzin-Wilip, two Wood-Anderson short-period seismographs, Shortt synchronome clock

Bulletin for September, 1937

28

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
121	Sept 1	G-W	(e)Z	8 <sup>h</sup> 56 <sup>m</sup> 42 <sup>s</sup>	According to Ottawa U. S. C. and G. S. gives $\phi = 31^{\circ}5$ S. $\lambda = 179^{\circ}$ W. $\Delta_{PR1-H} = 108^{\circ}5$ $\Delta_{meas} = 108^{\circ}5$  $H = 8^h38^m56^s$
		G-W	ePR <sub>1</sub> Z	8 57 44	
		G-W	iZ	8 57 55	
		G-W	e(SKS) <sub>E</sub>	9 03 48	
		G-W	eNE	9 04 44	
		G-W	eSKKSZ	9 04 52	
		G-W	eSN	9 05 30	
		G-W	eSPE	9 07 07	
		G-W	eZ	9 07 11	
		G-W	eZ	9 08 10	
		G-W	eE	9 12 31	
		G-W	eN	9 12 56	
		G-W	eSR <sub>1</sub> E	9 13 13	
		G-W	eLE	9 29.1	
		G-W	eZ	9 31.1	
		G-W	eE	9 32.6	
		G-W	eMZ	9 37.1	
122	Sept 1	G-W	ePNZ	17 <sup>h</sup> 29 <sup>m</sup> 25 <sup>s</sup>	Weak  Deep?
		G-W W-A	iNZ	17 29 27	
		W-A	eN	17 29 49	
		G-W	iNZ	17 29 52	
		W-A	iN	17 30 25	
		G-W	eSN	17 33 17	
		G-W	eE	17 33 21	
		G-W	iN	17 33 23	
		G-W	eZ	17 33 24	
		G-W	eZ	17 33 41	
		G-W	eE	17 33 44	
		G-W	eN	17 33 52	
		123	Sept 1	G-W	
G-W	eE			22 00 18	
G-W	eZ			22 00 28	
G-W	e(S) <sub>E</sub>			22 07 13	
G-W	eN			22 07 14	
G-W	eN			22 07 35	
G-W	eN			22 07 52	
G-W	eE			22 09 15	
G-W	eZ			22 09 42	
G-W	eLE			22 34.5	
G-W	eME			22 39.2	
			F	24 07 ±	



No.	Date	Inst.	Phase	G.M.C.T.	Remarks
124	Sept 3	G-W G-W W-A W-A G-W G-W G-W G-W G-W G-W W-A W-A G-W G-W G-W G-W G-W G-W G-W F	ePZ iPNEZ iNE ipPZ iPcPZ ePR1Z iPR2N eSZ eSN iSNE iSPEZ iScSNE eSR1E iXE iLE iME F	18 <sup>h</sup> 58 <sup>m</sup> 05 <sup>s</sup> 18 58 07 18 58 20 18 58 41 18 58 00 19 00 15 19 00 46 19 05 58 19 06 02 19 06 02 19 06 15 19 07 58 19 10 03 19 10 45 19 15.8 19 16.8	$\phi = 52^{\circ}.5$ N. $\lambda = 177^{\circ}.5$ W. H = 18 <sup>h</sup> 48 <sup>m</sup> 29 <sup>s</sup> h = 160 to 180 Km. by Brunner Depth Chart. $\Delta p-H = 58^{\circ}.7$ $\Delta_{meas} = 58^{\circ}.7$ Felt at sea by S.S. Bencluch, Hide Maru, and Kingsbury within range 49° to 51° N. latitude and 168° to 177° W. longitude.  Lost in microseisms
125	Sept 8	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W F	ePNEZ eNZ ePR1NE iNEZ i(PR2)Z eNE eE iN i(SKS)E iSE iPSE iSKKSE iN eSR1E F	0 <sup>h</sup> 54 <sup>m</sup> 44 <sup>s</sup> 0 57 45 0 58 43 0 59 10 1 01 35 1 03 42 1 04 37 1 04 39 1 04 40 1 05 12 1 06 10 1 09 31 1 09 38 1 12 59 3 40 +	$\Delta =$ approximately 100° H = 0 <sup>h</sup> 40.1 <sup>m</sup> Epicenter: Region South Atlantic south- east of Cape Horn.
126	Sept 9	G-W G-W G-W G-W G-W G-W	(e)PN (e)Z eN eZ eS?N eZ F	5 <sup>h</sup> 38 <sup>m</sup> 06 <sup>s</sup> 5 38 49 5 38 51 5 39 03 5 42 35 5 42 51 5 44 +	Weak
127	Sept 14	G-W G-W G-W G-W G-W	(e)PZ eN eZ eSE eN eE F	0 <sup>h</sup> 59 <sup>m</sup> 52 <sup>s</sup> 0 59 54 0 59 58 1 04 13 1 04 19 1 06 07	Lost in microseisms.

No.	Date	Inst.	Phase	G.M.C.T.	Remarks
128	Sept 15	G-W	e(P)Z	12 <sup>h</sup> 42 <sup>m</sup> 00 <sup>s</sup>	Epicenter region of $\phi = 8^{\circ}3' S.$ $\lambda = 162^{\circ}0' E.$ $H = 12^h27^m37^s$  May be slightly below normal depth.  $\Delta_{PR1-H} = 109^{\circ}8$ $\Delta_{meas} = 109^{\circ}2$
		G-W	e(P') <sub>NEZ</sub>	12 45 25	
		G-W	iPR1EZ	12 46 35	
		G-W	eN	12 46 40	
		G-W	ePR3Z	12 50 56	
		G-W	ePR4Z	12 52 14	
		G-W	iSNE	12 54 06	
		G-W	ePSE	12 55.8	
		G-W	iNEZ	12 56 21	
		G-W	ePPSZ	12 56 51	
		G-W	eLNE	13 20.3	
		G-W	eMZE	13 22.6	
		F Lost in changing records			
129	Sept 15	G-W W-A	ePNEZ	23 <sup>h</sup> 54 <sup>m</sup> 08 <sup>s</sup>	$\Delta_{P-H} = 24^{\circ}5$ $\Delta_{meas} = 24^{\circ}5$ $\phi = 14^{\circ}2' N.$ $\lambda = 91^{\circ}6' W.$ $H = 23^h48^m55^s$ $h = \text{at least } 100 \text{ km.}$ by Brunner Depth Chart.
		G-W W-A	ipPNZ	23 54 30	
		W-A	iPR1E	23 54 39	
		G-W	isPZ	23 54 51	
		G-W	ipPR1Z	23 55 01	
		G-W	i(S)NZ	23 58 03	
		G-W	iPcPZ	23 58 08	
		G-W	e(S)NEZ	23 58 24	
		G-W W-A	iNZ	23 58 30	
		G-W	isSE	23 58 22	
		G-W	e(L)E	24 00.9	
		G-W	eME	24 05.4	
		F Lost in microseisms			
130	Sept 16	W-A	iPN	18 <sup>h</sup> 50 <sup>m</sup> 34 <sup>s</sup>	Near earthquake or blast.
		W-A	iN	18 50 36	
		W-A	eE	18 50 38	
		W-A	eSN	18 50 40	
		W-A	iE F	18 50 41 18 52 ±	
131	Sept 17	G-W	(e)Z	9 <sup>h</sup> 49 <sup>m</sup> 45 <sup>s</sup>	Weak Distant
		G-W	eN	9 49 55	
		G-W	eN	9 55 52	
		G-W	eE	9 56 46	
		G-W	iN	9 56 48	
		G-W	e(S)N	9 58 29	
		G-W	eLN	10 05.1	
		G-W	eMN F	10 34.5 Lost in changing records	
132	Sept 30	G-W	ePNEZ	7 09 02	$\phi = 18^{\circ}9' N.$ $\lambda = 107^{\circ}3' W.$ $H = 7^h03^m40^s$ $\Delta_{P-H} = 24^{\circ}7$ $\Delta_{S-P} = 24^{\circ}7$ $\Delta_{meas} = 24^{\circ}7$
		W-A	ePNE	7 09 03	
		G-W	eE	7 12 56	
		G-W	eZ	7 13 19	
		G-W	eSNZ	7 13 27	
		W-A	eN	7 13 33	
		G-W	iNZ	7 13 34	
		G-W	iME F	7 16 49 8 38 ±	



No.	Date	Inst.	Phase	G.M.C.T.	Remarks
133	Sept 22	W-A W-A W-A W-A	(e)(P) <sub>N</sub> e(S) <sub>E</sub> eN iN F	18 <sup>h</sup> 30 <sup>m</sup> 00 <sup>s</sup> 18 30 08 18 30 09 18 30 10 18 32 ±	Near earthquake or blast
134	Sept 23	G-W G-W G-W G-W G-W	ePZ eZ iP'Z iZ iSZ F	13 <sup>h</sup> 20 <sup>m</sup> 54 <sup>s</sup> 13 24 08 13 24 36 13 25 30 13 33 28 Lost in microseisms	$\phi = 6.95$ S. $\lambda = 153.8$ E. H = 13 <sup>h</sup> 08 <sup>m</sup> 00 <sup>s</sup> Depth probably normal. $\Delta P-H = 114.5$ $\Delta_{meas} = 114.6$
135	Sept 27	W-A W-A G-W G-W G-W G-W G-W G-W G-W W-A G-W G-W G-W	eP'N iP'NEZ ipP'ZE ipP'N ePR <sub>1</sub> Z eSKPZ isSKPZ iN eNE iNE eLNE eMN F	9 <sup>h</sup> 14 <sup>m</sup> 48 <sup>s</sup> 9 14 49 9 15 01 9 15 03 9 16 34 9 17 45 9 17 59 9 24 51 9 24 52 9 24 53 10 06.0 10 14.0 10 29 ±	$\phi = 8.95$ S. $\lambda = 110.4$ E. h = 60 km ca, according to Brunner Depth Chart. $\Delta P-H = 145.0$ $\Delta_{meas} = 144.9$ Felt in central Java
136	Sept 28	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	iPNZ i(PR <sub>1</sub> )NZ i(PR <sub>1</sub> )Z iPR <sub>2</sub> Z eE eEZ iSE iE i(SR <sub>1</sub> )E eLNZ eLE eMZ eMNE F	6 26 14 6 26 41 6 26 50 6 27 02 6 28 40 6 30 35 6 30 42 6 31 18 6 31 26 6 35.1 6 35.6 6 37.6 6 38.6 8 13 ±	$\phi = 14.0$ N. $\lambda = 91.7$ W. H = 06 <sup>h</sup> 20 <sup>m</sup> 50 <sup>s</sup> Normal depth $\Delta P-H = 249.3$ $\Delta S-P = 249.3$ $\Delta_{meas} = 249.3$ Felt in Guatemala.
137	Sept 28	G-W G-W G-W G-W G-W G-W G-W	(e)PNZ iZ eE eSNE eNZ eLN eLZ eMNZ F	18 <sup>h</sup> 24 <sup>m</sup> 42 <sup>s</sup> 18 25 12 18 25 51 18 29 16 18 29 39 18 35.1 18 35.6 18 37.6 18 22 ±	In minute mark



No.	Date	Inst.	Phase	G.M.C.T.	Remarks
138	Sept 28	G-W	iPz	11h36m48s	Lost in changing records
		G-W	iN	11 36 50	
		G-W	iZ	11 37 50	
		G-W	eSN	11 41 28	
		G-W	eN	11 42 02	
			F		
139	Sept 30	G-W	eE	21h58m29s	Distant
		G-W	eN	21 59 02	Weak
		G-W	eE	22 11 48	
		G-W	eE	22 16 47	
		G-W	eLE	22 24.9	
		G-W	eN	22 26.4	
		G-W	eZ	22 27.2	
		G-W	eME	22 27.3	
			F	23 09 +	

Minor Seismic Activity:

Sept. 1, 3h40m to 3h44m; 18h25m to 23h28m: Sept. 2-3, 16h20m to 2h08m: Sept. 3, 14h31m to 24h00m: Sept. 4, 6h31m to 9h01m: Sept. 4-5, 16h34m to 9h45m: Sept. 5, 14h51m to 23h35m: Sept. 8, 16h20m to 20h59m: Sept. 9, 16h06m to 22h23m: Sept. 10, 8h29m to 9h55m: Sept. 10-11, 14h51m to 2h47m: Sept. 12, 17h15m to 23h00m: Sept. 14-15, 20h55m to 7h45m: Sept. 15-16, 14h49m to 4h05m: Sept. 16, 14h59m to 22h02m: Sept. 17, 6h19m to 6h22m: Sept. 20, 15h21m to 21h06m: Sept. 21, 8h32m to 12h48m; 21h26m to 22h02m: Sept. 22, 3h44m to 5h00m: Sept. 23-24, 16h00m to 1h53m: Sept. 24, 6h10m to 8h00m; 19h28m to 20h02m: Sept. 25, 4h45m to 5h33m; 7h33m to 9h33m: Sept. 29, 18h27m to 23h20m.

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## SEISMOGRAPHIC STATION, ST. LOUIS UNIVERSITY, ST. LOUIS, MO., U. S. A.

Three Galitzin-Wilip, two Wood-Anderson short-period seismographs, Shortt synchronome clock

Bulletin for October, 1937

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No.	Date	Inst.	Phase	G. L. C. T.	Remarks
140	Oct 5	G-W	ePZ	6 <sup>h</sup> 26 <sup>m</sup> 16 <sup>s</sup>	$\Delta_{P-H} = 22^{\circ}4$ $\Delta_{meas} = 22^{\circ}4$  $\phi = 2295$ N. $\lambda = 10895$ W.  $H = 6^{h}21^{m}17^s$  Depth probably normal
		G-W	eZ	6 26 24	
		G-W	ePR <sub>1</sub> Z	6 26 43	
		G-W	eN	6 26 58	
		G-W	(e) <sub>E</sub>	6 30 15	
		G-W	eSE	6 30 20	
		G-W	eNE	6 30 27	
		G-W	i <sub>E</sub>	6 30 32	
		G-W	eZ	6 30 36	
		G-W	eLNE	6 31.9	
		G-W	eLZ	6 32.4	
		G-W	iMNE	6 33.3	
		G-W	iMZ	6 34.4	
				F	
141	Oct 5	W-A G-W	ePNE	22 <sup>h</sup> 58 <sup>m</sup> 54 <sup>s</sup>	Near earthquake
		W-A	i <sub>E</sub>	22 58 55	
		W-A	i <sub>N</sub>	22 58 56	
		W-A	i <sub>NE</sub>	22 58 59	
		W-A	i <sub>N</sub>	22 59 02	
		W-A	i <sub>N</sub>	22 59 08	
		W-A	i <sub>N</sub>	22 59 13	
		W-A	i <sub>SN</sub>	22 59 16	
		W-A	eS <sub>E</sub>	22 59 18	
		W-A	i <sub>NE</sub>	22 59 22	
		G-W	eN	22 59 25	
		W-A	i <sub>E</sub>	22 59 34	
				F	
142	Oct 6	W-A	(e) <sub>N</sub>	9 <sup>h</sup> 52 <sup>m</sup> 03 <sup>s</sup>	$\phi = 1797$ N. $\lambda = 9990$ W.  $H = 9^{h}47^{m}16^s$  $h = 100$ Km ca by the Brunner Depth Chart.  $\Delta_{P-H} = 22^{\circ}4$ $\Delta_{meas} = 22^{\circ}4$
		W-A	i <sub>N</sub>	9 52 05	
		G-W	iPZ	9 52 06	
		G-W	ipPZ	9 52 20	
		G-W	iZ	9 52 25	
		W-A	i <sub>N</sub>	9 52 26	
		G-W	iZ	9 53 04	
		G-W	eN	9 55 38	
		G-W	eSZ	9 56 03	
		W-A	eSNE	9 56 03	
		G-W	iZ	9 56 26	
		G-W	iZ	9 57 52	
		G-W	eLN	9 59.4	
				F	

No.	Date	Inst.	Phase	G. M. C. T.	Remarks
143	Oct 6	G-W	(e)Z	17 <sup>h</sup> 19 <sup>m</sup> 40 <sup>s</sup>	
		G-W	(e)Z	17 22 57	
		G-W	(e)E	17 23 19	
		G-W	eZ	17 23 30	
		G-W	iZ	17 24 21	
		G-W	eN	17 24 29	
		G-W	eE	17 30 05	
		G-W	eSE	17 31 26	
		G-W	ePSE	17 33 54	
		G-W	eN	17 34 06	
		G-W	ePPSE	17 34 58	
		G-W	eLZ	18 00.4	
		G-W	eMZ	18 02.9	
		G-W	F	20 10 +	
144	Oct 6	G-W	eE	22 <sup>h</sup> 07 <sup>m</sup> 50 <sup>s</sup>	Weak
		G-W	eLE	22 12.9	
		G-W	eME	22 30.9	
		G-W	F	22 41 +	
145	Oct 12	G-W	ePN	16 <sup>h</sup> 05 <sup>m</sup> 08 <sup>s</sup>	Weak Deep?
		G-W	eZ	16 05 09	
		G-W	eZ	16 08 33	
		G-W	eE	16 09 22	
		G-W	eN	16 09 40	
		G-W	eSNZ	16 10 07	
		G-W	eE	16 10 08	
		G-W	eLE	16 14.5	
		G-W	eME	16 20.5	
G-W	F	18 19 +			
146	Oct 12	G-W	iPNZ	21 <sup>h</sup> 01 <sup>m</sup> 37 <sup>s</sup>	Weak
		G-W	ipPZ	21 02 05	
		G-W	iN	21 02 06	
		G-W	iZ	21 02 17	
		G-W	iN	21 02 18	
		G-W	(e)E	21 09 53	
		G-W	iSNE	21 10 20	
		G-W	iSSE	21 11 00	
		G-W	eN	21 11 09	
		G-W	iE	21 12 10	
		G-W	F	22 52 +	



No.	Date	Inst.	Phase	G.L.C.T.	Remarks
147	Oct 24	G-W	ePZ	11 <sup>h</sup> 43 <sup>m</sup> 56 <sup>s</sup>	$\Delta P-H = 41^{\circ}7$
		G-W	iNZ	11 45 48	$\Delta_{meas} = 41^{\circ}8$
		G-W	eN	11 50 13	Depth normal.
		G-W	eW	11 53 34	Minute mark
		G-W	eN	11 54 04	$\phi = 59^{\circ}7$ N. $\lambda = 148^{\circ}8$ W.
		G-W	eLN	11 59.1	H = 11 <sup>h</sup> 36 <sup>m</sup> 07 <sup>s</sup>
		G-W	F	12 29 ±	

Minor Seismic Activity:

Oct. 3, 19h43m to 19h55m: Oct. 4, 08h35m to 09h30m: Oct. 5, 18h37m to 22h53m: Oct. 7, 08h09m to 08h10m; 16h44m to 23h32m: Oct. 19-20, 15h08m to 10h34m: Oct 20, 14h41m to 22h55m: Oct 24, 04h06m to 07h28m.

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Three Galitzin-Wiip, two Wood-Anderson short-period seismographs, Shortt synchronome clock  
Bulletin for November, 1937

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No.	Date	Inst.	Phase	G. M. C. T.	Remarks
148	10	G-W	(e)Z	6 <sup>h</sup> 25 <sup>m</sup> 42 <sup>s</sup>	Weak
		G-W	eL <sub>N</sub>	5 32.1	
		G-W	e(L <sub>M</sub> )Z	6 35.1	
			F	7 06 ±	
149	13	G-W	eN	10 <sup>h</sup> 38 <sup>m</sup> 41 <sup>s</sup>	Weak
		G-W	eN	10 44 30	
		G-W	e(L)N	10 47.0	
		G-W	e(L)Z	10 48.0	
		G-W	eM <sub>Z</sub>	11 00.0	
			F	11 33 ±	
150	14	G-W	iPNZ	11 <sup>h</sup> 11 <sup>m</sup> 49 <sup>s</sup>	Destructive at Chitral in northwestern India.  Epicenter according to Rev. J. J. Lynch, S. J. of Fordham University Ø = 35°6' N λ = 70°8' E.  H = 10 <sup>h</sup> 58 <sup>m</sup> 14 <sup>s</sup>  h = 250 Km.  long period Lost in changing records
		G-W	iz	11 11 53	
		G-W	epPZ	11 12 45	
		G-W	iP'Z	11 15 52	
		G-W	ePR <sub>1</sub> NZ	11 16 07	
		G-W	epP'Z	11 16 45	
		G-W	ipPR <sub>1</sub> Z	11 17 03	
		G-W	iPR <sub>2</sub> N	11 18 11	
		G-W	iSKS <sub>N</sub>	11 22 01	
		G-W	iSKS <sub>N</sub>	11 22 42	
		G-W	iS <sub>N</sub>	11 23 05	
		G-W	isSKS <sub>N</sub>	11 23 48	
		G-W	iz	11 23 50	
		G-W	iSP <sub>N</sub>	11 24 49	
		G-W	isS <sub>N</sub>	11 25 13	
		G-W	iPPS <sub>N</sub> Z	11 25 59	
		G-W	eN	11 34.5	
	F				
151	17	W-A	iP*E	17 <sup>h</sup> 05 <sup>m</sup> 07 <sup>s</sup>	Near earthquake ΔS*-P* = 0°33' = 72.6 mi. Ø = 38°34' N. λ = 82°05' W. H = 11 <sup>h</sup> 04 <sup>m</sup> 47.7 <sup>s</sup> Felt near Centralia, Ill.
		W-A	iPnE	17 05 08	
		W-A	iPGE	17 05 09	
		W-A	iS*	17 05 21	
			F	17 08 ±	
152	28	G-W	(e)Z	5 <sup>h</sup> 43 <sup>m</sup> 20 <sup>s</sup>	
		G-W	iz	5 43 38	
		G-W	eZ	5 46 29	
		G-W	eN	5 46 31	
		G-W	iz	5 46 35	
		G-W	iN	5 46 39	
	F	7 58 ±			

Minor Seismic Activity: Nov. 13, 15h56m to 23h17m, Nov. 14, 7h09m to 10h45m; 15h00m to 23h30m; Nov. 15, 22h01m to 23h20m; Nov. 16, 0h06m to 0h12m, 3h39m to 4h00m, 22h03m to 22h11m; Nov. 18, 1h00m to 1h08m Nov. 25, 5h02m to 6h22.

**FLORISSANT****SEISMOGRAPHIC STATION, ST. LOUIS UNIVERSITY, ST. LOUIS, MO., U. S. A.**

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Bulletin for December, 1937

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No.	Date	Inst.	Phase	G.M.C.T.	Remarks
153	5	G-W	eLZ F	5h10.6 <sup>m</sup> 5 54 ±	Time doubtful
154	6	G-W G-W G-W G-W G-W	(e)Z e <sub>N</sub> e <sub>N</sub> e <sub>Z</sub> F	21h55 <sup>m</sup> 0 21 55.6 21 59.0 22 00.3 22 11 ±	Time doubtful Weak
155	8	G-W G-W G-W G-W	ePZ i <sub>N</sub> e(S) <sub>N</sub> e <sub>Z</sub> F	2h30 <sup>m</sup> 51 <sup>s</sup> 2 30 54 2 43.1 2 44.5 2 59 ±	Weak
156	8	G-W G-W G-W	(e)Z eLNZ e(M)Z F	8h51 <sup>m</sup> 27 <sup>s</sup> 9 41.1 9 49.1 10 12 ±	
157	18	G-W G-W G-W G-W	e <sub>Z</sub> e <sub>N</sub> e <sub>Z</sub> e <sub>N</sub> F	20h55 <sup>m</sup> 38 <sup>s</sup> 20 58.5 21 02.9 21 03.4 21 30 ±	Weak
158	22	G-W W-A W-A G-W G-W G-W G-W G-W G-W G-W G-W G-W	iP <sub>NZ</sub> eP <sub>N</sub> e <sub>E</sub> i <sub>NZ</sub> ePR <sub>2Z</sub> e <sub>Z</sub> e <sub>N</sub> iS <sub>NZ</sub> e <sub>NE</sub> e(L) <sub>N</sub> i <sub>Z</sub> F	3h42 <sup>m</sup> 43 <sup>s</sup> 3 42 44 3 42 45 3 42 47 3 43 32 3 47 04 3 47 07 3 47 13 3 47 17 3 50.5 3 51 21 5 14 ±	∅ = 17° 2 N. λ = 105° 7 W. H = 3h37m15s Depth normal Δ <sub>P-H</sub> = 25 <sup>o</sup> .3 Δ <sub>S-P</sub> = 25 <sup>c</sup> .3 Δ <sub>meas</sub> = 25 <sup>o</sup> .3



Florissant Bulletin for December, 1938

No.	Date	Inst.	Phase	G. M. C. T.	Remarks
159	23	G-W	iPNZ	7 <sup>h</sup> 40 <sup>m</sup> 30 <sup>s</sup>	Aftershock of No. 158?
		G-W	ePR <sub>1</sub> N	7 41 00	
		G-W	eSN	7 44 57	Time doubtful
		G-W	iSN	7 44 59	
		G-W	eZ	7 45 01	
		G-W	iMN	7 48 16	
		G-W	eZ	7 48.7	
		G-W	F	8 13 ±	

Clock not in operation from December 23 to January 1

Minor Seismic Activity: December 7, 18h11m to 18h30m; Dec. 13, 19h57m to 20h29m; 23h19m to 23h47m; December 16, 10h35m to 11h14m.

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