



FLORISSANT

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

Three Galitzin-Wilip, two Wood-Anderson Shortt period seismographs. Shortt synchronous clock

BULLETIN FOR 1971

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
1	Jan. 2	III	iP _{ENZ}	9 54 23	G-W; W-A	Compression Epicenter 18°N. 108.5 W.
			iP _{RIEZ}	9 55 01	G-W	
			eS _E	9 58 45	G-W	
			iS _{EN}	9 58 53	G-W	
			eL _{EN}	10 01 40	G-W	
			iM _E	10 02 12	G-W	
			F	13 40 ±	G-W	
2	Jan. 2	I	eP	11 17 19	W-A	$\Delta = 26.9$
			iP _{EN}	11 17 24	W-A	
			iS _N	11 21 50	G-W	
			L	11 24 30	G-W	
			F	12 00 ±	G-W	
3	Jan. 2	I	eP _{EN}	11 41 02	W-A	
			eS _N	11 45 21	W-A	
			F	11 55 ±	W-A	
Jan. 2-4		Moderate microseisms				
Jan. 7-8		Moderate microseisms				
4	Jan. 8	I	eP _{EN}	0 17 20	W-A	$\Delta = 17.6$ Felt in Province of Quebec.
			e _{EN}	0 17 46	W-A	
			e(S) _{EN}	0 20 33	W-A	
			eS _{EN}	0 20 46	W-A	
			iM _N	0 22 07	W-A	
			F	0 30 ±	W-A	
Jan. 9		Microseisms with maximum 16h-22h.				
5	Jan. 12	I	eP _{EN}	20 44 59	W-A	$\Delta = 67.0$
			eS _E	20 53 58	G-W	
			eL _E	21 05 30	G-W	
			S	22 35 ±	G-W	
Jan. 14-17		Moderate microseisms. Slight Maximum 16th. 0h-8h.				

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G. M. Time h. m. s.	Instruments	Remarks
6	Jan. 15	III	iP _{ENZ}	1 55 48	G-W	Compression. Epicenter 15° N. 97° W. Destructive in southern part of Mex- ico.
			i _{EN}	1 55 51	G-W	
			iPR _{1EN}	1 56 19	G-W	
			iS _{EN}	2 00 01	W-A	
			eL _N	2 03 00	W-A	
			iM _N	2 06 00	W-A	
			F	5 30 ±	W-A	
7	Jan. 15	I	eP _{EN}	13 56 25	W-A	Aftershock of the above. Δ = 25.3
			ePR _{1N}	13 56 57	W-A	
			ePR _{2N}	13 57 07	W-A	
			iS _E	14 00 44	W-A; G-W	
			F	14 10 ±		
8	Jan. 16	II	iP _{ENZ}	16 57 11	W-A; G-W	Compression. Δ = 23.6 Surface wav- es hardly perceptible.
			i _{NZ}	16 57 47	G-W	
			i _{NZ}	16 58 03	G-W	
			iS _{EN}	17 01 17	W-A; G-W	
			i _N	17 01 29	G-W	
			i _N	17 02 26	G-W	
			F	17 55 ±	G-W	
9	Jan. 16	II	iP _{ENZ}	19 25 00	G-W; W-A	Compression. Epicenter 14.5° N. 97° W.
			i _{NZ}	19 25 02	G-W	
			i _Z	19 25 18	G-W	
			iPR _{1NZ}	19 25 28	G-W	
			iS _{EN}	19 29 14	G-W; W-A	
			i _N	19 29 34	G-W	
			i _E	19 30 22	G-W	
			F	21 40 ±	G-W	

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No.	Date	Char.	Phase	Time h. m. s.	Instruments	Remarks
10	Jan. 17	III	e _P _{ENZ} i _P _{ENZ} i _{NZ} i _S _{EN} i _N i _L _{EN} i _M _{EN} F	3 54 59 3 55 00 2 55 40 2 58 54 3 01 08 3 01 39 3 03 00 Covered	G-W;W-A G-W G-W G-W W-A G-W G-W by following	Compression. Epicenter 25°N. 97°W.
11	Jan. 17	II	i _P _{EN} i _S _{EN} e _L _{EN} e _M _{EN} F	5 41 01 5 45 15 5 50 00 5 52 00 7 20 ±	G-W;W-A G-W G-W G-W G-W	Compression $\Delta = 24^{\circ}6$ L and M rel- atively small.
	Jan. 17-19 Jan. 20		Microseisms with maximum on 19th. 2h-4h. Irregular microseismic disturbance 17h-22h.			
12	Jan. 21	I	e _P _E e _S _N F	9 10 21 9 10 34 9 15 ±	W-A W-A W-A	Local
13	Jan. 23	I	e _P _N i _N i _P _{NZ} i _S _N i _S _E e _L _{EN} e _M _{EN} F	5 57 12 5 57 17 5 57 25 6 01 26 6 01 28 6 05 00 6 08 20 7 10 ±	W-A W-A G-W G-W G-W G-W G-W G-W	$\Delta = 24^{\circ}6$ With phase times at Buffalo. Epicenter 15°N. 97°W.
14	Jan. 24	I	e _P _Z i _S _N F	14 01 31 14 11 21 Covered	G-W G-W by following	$\Delta = 75^{\circ}8$
15	Jan. 24	I	e _P _N e _S _N M _N F	15 29 12 15 33 45 15 38 50 16 10 ±	W-A;G-W G-W G-W G-W	$\Delta = 27^{\circ}2$

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G. M. Time h. m. s.	Instruments	Remarks
16	Jan. 25	I	eP _{NZ}	13 40 06	G-W	$\Delta = 27^{\circ}.6$
			eS _N	13 44 42	G-W	
			iM _N	13 49 43	G-W	
			F	14 15 ±	G-W	
17	Jan. 27	I	eP _N	14 36 53	W-A	$\Delta = 44^{\circ}.5$
			iS _N	14 43 23	G-W	
			L	14 53 00	G-W	
			F	15 00 ±	G-W	
18	Jan. 27	III	eP _Z	20 24 20	G-W	Epicenter: Western China 31°N. 108°E.
			iPR _{1Z}	20 28 59	G-W	
			iZ	20 31 32	G-W	
			iN	20 34 46	G-W	
			iPS _{NZ}	20 38 39	G-W	
			iSR _{1EN}	20 44 36	G-W	
			eL _E	21 00 30	G-W	
			iM _E	21 12 30	G-W	
			F	24 45 ±	G-W	
19	Jan. 28	III	eP _{NZ}	21 38 53	G-W	Epicenter near Marianas Islands
			eP _{1Z}	21 42 26	G-W	
			iPR _{1NZ}	21 43 12	G-W; W-A	
			iZ	21 46 03	G-W	
			eS _{cPcSEN}	21 49 15	G-W	
			iEN	21 49 46	G-W	
			iEN	21 50 47	G-W; W-A	
			iP _{SEZ}	21 52 40	G-W	
			iSR _{1EN}	21 58 23	G-W; W-A	
			eL _{EN}	22 09 00	G-W	
			iM _{EN}	22 15 55	G-W	
			F	25 50 ±	G-W	

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No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
20	Jan. 29	I	eP _{ENZ}	17 15 35	W-A; G-W	$\Delta = 25^{\circ}.7$
			iP _N	17 15 37	W-A	
			iP _Z	17 15 40	G-W	
			iS _E	17 19 57	G-W	
			iE	17 20 17	G-W	
			L _Z	17 22 30	G-W	
			M _{ENZ}	17 26 30	G-W	
			F	18 30 ±		
	Jan. 31		Irregular microseisms.			

Besides the above seismic movement was recorded at 2d. 0.5h-1.9h; 2d. 18.4h-18.7h; 4d. 0.6h-1.1h; 4d. 6.4h-6.9h; 4d. 11.5h-11.8h; 4d. 20.4h-20.6h; 7d. 13.3h-13.7h; 13d. 23.4h-23.7h; 15d. 21.4h-23.0h; 15d. 23.2h-25.3h; 20d. 9.9h-11.2h; 20d. 12.6h-14.3h; 23d. 23.5h-23.8h; 28d. 6.4h-7.2h.

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G. M. Time h. m. s.	Instruments	Remarks
	Feb. 1-2	III	iP _Z iZ P' _Z iPR ₁ Z iPR ₁ Z iS _{CP} P _{CP} S _{EN} iW iPS _{ENZ} iSR ₁ EN iSR ₂ N eM _E F	23 01 31 23 01 48 23 05 19 23 06 29 23 06 47 23 13 27 23 15 26 23 16 12 23 22 29 23 26 12 23 43 00 Covered by following	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	Dilatation Dilatation. Epicenter 39°S. 177°E. Napier, New Zealand des- troyed.
21	Feb. 3	I	ePR ePS F	00 58 48 01 08 33 5 30 ±	W-A W-A W-A	After-shock of preceding.
22	Feb. 9	I	eP _N eS _{EN} F	4 20 26 4 28 04 4 50 ±	W-A W-A W-A	
23	Feb. 10	III	iP' _Z iPR ₁ NZ iZ i _{EN} e _{EN} i _N i _{EN} iM _E F	6 54 04 6 57 20 6 58 04 7 07 05 7 11 52 7 17 00 7 22 40 7 58 00 10 30 ±	G-W G-W G-W G-W G-W G-W G-W G-W G-W	South of Sumatra
24	Feb. 11	I	eZ e _E e _E eM _{EZ} F	17 14 05 17 29 25 17 32 15 18 04 00 19 25 ±	G-W G-W G-W G-W G-W	

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No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
25	Feb. 12	I	iP _Z i _Z e _{EN} eL _E F	6 03 35 6 06 54 6 26 30 6 52 00 Covered by following	G-W G-W G-W G-W	South of Sumatra.
26	Feb. 12	I	eP _N iS _N eL _N F	8 11 33 8 15 54 8 19 00 9 15 ±	W-A; G-W W-A; G-W G-W G-W	Acapulco Deep
27	Feb. 13	II	ePR _{1E} eS _{cPcS} eS _{cPcPcS} _{EN} iPS M F	1 47 06 1 52 36 1 53 57 1 56 48 2 29 00 5 40 ±	G-W G-W G-W G-W G-W G-W	A faint quake preceded and obscured this record. Epicenter, New Zealand.
28	Feb. 14	II	iP' _Z ePR _{1NZ} i _Z ePS _{EN} eSR _{1N} e eL _{EN} eM _{EN} F	14 18 27 14 21 39 14 21 42 14 32 58 14 40 16 14 47 32 15 03 30 15 18 30 16 40 ±	G-W; W-A G-W G-W G-W G-W G-W G-W G-W	
29	Feb. 14	III	iP _{EN} iS _N i _N iL _E i _{EN} F	15 54 06.9 15 54 08.7 15 54 09.4 15 54 16.3 15 54 19.4 15 56 ±	W-A W-A W-A W-A W-A W-A	Blast. 20 tons dynamite in limestone quarry 12.6 km. distant. iP= compression. Max. amplitudes = 58 mm. ±
30	Feb. 15	I	e _N e _N F	8 43 40 8 47 48 8 50 ±	W-A W-A W-A	

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No.	Date	Char.	Phase	G. M. Time h. m. s.	Instruments	Remarks
	Feb. 16		Microseisms with maximum at 1 hr.			
31	Feb. 16	I	iP _Z i _Z e _Z e _{EN} e _{EN} e _{iEN} e _{MEN} F	19 01 16 19 01 34 19 04 37 19 11 38 19 17 20 19 29 00 19 34 00 20 40 ±	G-W;W-A G-W G-W G-W G-W G-W G-W G-W	Compression
32	Feb. 19	I	iP _{NZ} i _Z i _Z e _{EN} e _N iP _{NZ} i _Z e _E e _{M_E} F	18 00 03 18 01 33 18 03 07 18 13 40 18 22 00 18 43 54 18 46 57 18 56 03 19 01 30 20 30 ±	G-W;W-A G-W G-W G-W G-W W-A;G-W G-W G-W G-W G-W	Compression. Apparently second shock.
33	Feb. 19	I	e _N i _{EN} i _{EN} F	20 07 52.2 20 07 52.9 20 07 53.4 20 08 ±	W-A W-A W-A W-A	
34	Feb. 20	II	iP _{NZ} i _Z i _Z i _Z i _{SN} i _{EN} i _N i _N i _{EN} i _{EN} F	5 45 35 5 46 58 5 47 32 5 50 15 5 55 26 5 55 44 5 56 47 5 57 27 6 01 33 6 03 11 8 10 ±	G-W;W-A G-W G-W G-W G-W;W-A G-W;W-A G-W G-W G-W G-W G-W	Epicenter. E. Siberia. Perhaps several quakes superposed. Surface waves relatively small.

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No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
	Feb. 20		Microseisms with maximum at 20h.			
35	Feb. 23	I	iP _{EN} iS _N F	4 26 04 4 35 10 4 40 ±	W-A W-A; G-W	No surface waves.
	Feb. 23		Microseisms with maximum at 17-18h.			
	Feb. 23-24		Instruments not in operation 17h-17h.			
36	Feb. 27	I	e _N e _{EZ} i _Z e _Z i _Z eL _{EN} F	9 56 47 9 58 35 9 59 49 10 09 00 10 00 00 10 07 00 16 00 ±	W-A G-W G-W G-W G-W G-W G-W	

Besides the above partial records of weak or distant quakes
 3d. 5.7-6.2h; 3d. 9.6-10.5h; 4d. 13.1-13.3h; 5d. 9.9-10.3h; 5d. 17.9-18.1h; 5d. 19.7-20.2h; 7d. 5.1-5.3; 7d. 3.6-4.7h; 8d. 1.3-1.5h; 8d. 4.1-6.7h; 10d. 2.3-3.1h; 11. 20.9-21.1h; 13d. 1.0-1.6h; 13d. 19.9-20.1h; 17d. 2.6-3.5h; 19d. 21.9-22.3h; 20d. 10.6-11.7h; 21d. 22.6-23.2h; 25d. 21.6-22.2h.

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No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
March 1 Moderate Microseisms with maximum at 16h.						
37	Mar. 1	I	e _N	14 34 43.0	W-A	
			e _E	14 34 44.4	W-A	
			i _{EN}	14 34 51.4	W-A	
			F	14 40 ±	W-A	
38	Mar. 2	I	e _Z	2 33 20	G-W	Solomon Is-lands? Phases not clear.
			i _Z	2 36 40	G-W	
			i _Z	2 37 47	G-W	
			i _E	2 43 24	G-W	
			i _N	2 45 01	G-W	
			i _N	2 45 54	G-W	
			i _E	2 47 41	G-W	
			i _N	2 53 32	G-W	
			LN	3 07 00	G-W	
			i _E	3 10 30	G-W	
			F	5 10	G-W	
Mar. 4-6 Very intense microseisms beginning about 0h. on the 4th rising to maximum by 0h. on the 5th and subsiding by 0h. on the 6th.						
39	Mar. 7	II	e _P _{NZ}	0 47 39	G-W; W-A	Epicenter 7°5' N. 84°W. Δ _{S-P} 31.3 Difficult of interpretation. Data from Zurich show that an earthquake in Serbia was superposed.
			i _P _{NZ}	0 47 41	" "	
			i _{NZ}	0 48 28	G-W	
			i _{NZ}	0 48 43	G-W	
			e _S _N	0 52 42	G-W	
			i _S _N	0 52 58	G-W	
			M _E	1 02 30	G-W	
			F	2 30 ±	G-W	
40	Mar. 7	I	e _{NZ}	22 04 00	G-W; W-A	
			e _E	22 26 45	G-W	
			e _E	22 29 10	G-W	
			e _M _{EZ}	22 55 30	G-W	
			e _M _{2EZ}	23 07 00	G-W	
			F	24 25 ±	G-W	

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
41	Mar. 8	II	iP _Z	2 02 30	G-W; W-A	Destructive along Greco- Serbian border. $\Delta_{S-P} 77.1$
			i _Z	2 05 33	G-W	
			eS _{EN}	2 12 27	G-W	
			iS _{EN}	2 12 31	G-W	
			i _E	2 12 55	G-W	
			iSR _{1EN}	2 17 43	G-W	
			eL _{EN}	2 26 01	G-W	
			iM _{EN}	2	G-W	
			F	4 00 ±	G-W	
42	Mar. 8	I	iP _{EN}	3 40 33.1	W-A	$\Delta = 190$ km.
			iS _{EN}	3 40 55.5	W-A	
			F	3 42 ±	W-A	
43	Mar. 9	III	eP _{NZ}	2 01 38	G-W; W-A	Epicenter 38°N. 143°E. $\Delta = 88.5$
			iP _{NZ}	2 01 40	G-W; W-A	
			i _Z	2 02 05	G-W	
			i _Z	2 05 21	G-W	
			eS _{EN}	2 11 55	G-W	
			iS _{EN}	2 12 06	G-W	
			i _{EN}	2 12 20	G-W	
			i _{EN}	2 12 46	G-W	
			i _E	2 18 06	G-W	
			L _E	2 25 01	G-W	
			M _E	2 35 31	G-W	
			F	8 20 ±	G-W	
			~ Mar. 9 Moderate Microseisms with maximum at 16h.			
44	Mar. 10	I	eP _{EN}	3 34 35	W-A	
			eS _{E?}	3 39 40	G-W	
			L _{EN}	3 43 00	G-W	
			F	4 00 ±	G-W	

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45	Mar. 11	I	e _Z	12 41 10	G-W	
			e _{EZ}	12 44 45	G-W	
			i _{SE}	12 51 06	G-W	
			e _{EN}	12 53 33	G-W	
			e _{ENZ}	12 59 00	G-W	
			M _{EN}	13 19 10	G-W	
			F	15 15 ±	G-W	
46	Mar. 12	I	i _{EN}	11 05 03	G-W	
			i _Z	11 08 16	G-W	
			LN	11 38 00	G-W	
			F	12 40 ±	G-W	
Mar. 16		Moderate microseisms with maximum at 18h.				
47	Mar. 18	III	e _{P_{NZ}}	8 13 54	G-W; W-A	Compression. Dilatation. Epicenter 32°S. 73°W.
			i _{NZ}	8 13 59	G-W; W-A	
			e _{SEN}	8 23 24	G-W	
			i _{SEN}	8 23 29	G-W	
			i _E	8 27 21	G-W	
			i _{SR₁EN}	8 28 23	G-W	
			LEN	8 36 00	G-W	
			M _{EN}	8 43 00	G-W	
			F	12 30 ±	G-W	
48	Mar. 18	II	e _{NZ}	20 32 35	G-W; W-A	Southeast Coast of Mindanao, Phil ippines.
			i _{PRZ}	20 34 16	G-W	
			i _Z	20 35 13	G-W	
			i _Z	20 36 02	G-W	
			i _{ScPcSEN}	20 39 34	G-W	
			i _{EN}	20 40 16	G-W	
			i _{EN}	20 41 20	G-W	
			i _{EN}	20 44 56	G-W	
			i _{SR₁N}	20 51 09	G-W	
			L	21 12 30	G-W	
			F	23 00 ±	G-W	

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49	Mar. 19	II	ez	6 41 21	G-W	Northwest coast of Luzon, Phil- ippines.
			iPR _Z	6 44 53	G-W	
			iN	6 52 16	G-W	
			iE	6 53 02	G-W	
			iPSN	6 54 35	G-W	
			eSR ₁ EN	7 00 56	G-W	
			iEN	7 03 54	G-W	
			LE F	7 22 00	G-W	
50	Mar. 20	I	iPE	18 14 18.0	W-A	Blast
			iSN	18 14 19.2	W-A	
			F	18 15 ±		
51	Mar. 21	I	ePN	13 52 15.8	W-A	
			eE	13 52 21.1	W-A	
			eN	13 53 05.2	W-A	
			eEN	13 53 23.7	W-A	
			iN	13 53 27.3	W-A	
			iE	13 53 29.0	W-A	
			iEN	13 53 30.5	W-A	
			F	13 56 ±	W-A	
Mar. 22-23 Strong microseisms with maximum at 14-16h. on 23rd.						
52	Mar. 25	I	eN	2 58 08.2	W-A	Local
			eN	2 58 29.8	W-A	
			eN	2 58 43.5	W-A	
			F	3 00 ±	W-A	
March 24 Irregular microseisms 12-20h.						
53	Mar. 25	I	eEN	3 02 24.3	W-A	Local
			eEN	3 02 31.9	W-A	
			F	3 04 ±	W-A	

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
54	Mar. 28	II	i _{NZ}	12 57 46	G-W; W-A	Epicenter 7°S. 138°E.
			i _Z	12 57 48	G-W	
			i _{EN}	12 57 49	W-A	
			i _Z	12 58 01	G-W	
			i _{ENZ}	13 01 00	G-W; W-A	
			i _{ENZ}	13 01 14	G-W	
			i _{EN}	13 01 29	G-W	
			i _{EN}	13 02 32	G-W	
			i _Z	13 03 46	G-W	
			i _{EN}	13 07 02	G-W; W-A	
			i _{EZ}	13 10 06	G-W	
			i _{EZ}	13 12 02	G-W	
			i _E	13 14 12	G-W	
			i _{EN}	13 17 17	G-W	
			i _{EN}	13 18 31	G-W	
			i _{EN}	13 20 02	G-W	
			i _{EN}	13 22 52	G-W	
F	16 15 ±	G-W	Practically no surface waves.			
	Mar. 28	Irregular microseisms at 6 - 21h.				
55	Mar. 29	I	i _{PZ}	17 34 31	G-W	Compression. Δ _{S-P} 54.09
			i _{SEN}	17 42 10	G-W	
			F	End covered by following		
56	Mar. 29	I	i _{P_{NZ}}	18 04 17	W-A; G-W	Dilatation. Dilatation. Δ = 80.4 No surface waves.
			i _Z	18 04 41	G-W	
			i _{SN}	18 14 31	W-A; G-W	
			i(S) _N	18 14 37	W-A; G-W	
End covered by following						
57	Mar. 29	I	i _{P_{NZ}}	19 21 52	W-A; G-W	Δ = 54.04
			i _Z	19 21 59	G-W	
			i _{SE}	19 29 28	G-W	
			e _{ME}	19 44 00	G-W	
			F	21 35 ±	G-W	

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

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
58	Mar. 31	II	iP _N	16 07 52	W-A	Managua destroyed.
			iP _{NZ}	16 07 56	G-W	
			i _{NZ}	16 08 27	G-W; W-A	
			i _{NZ}	16 09 06	G-W	
			i _{NZ}	16 10 01	G-W	
			i _{SN}	16 12 30	G-W	
			i _N	16 12 56	G-W	
			eM _E	16 22 00	G-W	
			F	19 20 ±	G-W	

Besides the above traces of seismic movement at 2d. 8.9-9.1h; 5d. 19.2-19.6h; 7d. 19.1-19.7h; 8d. 6.2-7.6h; 8d. 12.2-13.8h; 8d. 22.2-22.5h; 11d. 6.3-7.9h; 12d. 19.4-21.5h; ;4d. 13.2-15.4h; 22d. 21.8-21.9h; 23d. 14.8-15.0h.

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
59	Apr. 1	I	eP _{NZ}	13 19 10	W-A; G-W	$\Delta_{S-P} \quad 25^{\circ}.6$
			iN	13 19 20	W-A	
			iZ	13 22 15	G-W	
			eS _N	13 23 31	G-W	
			eL _E	13 28 30	G-W	
			eM _{NZ}	13 33 30	G-W	
			F	14 15 ±	G-W	
60	Apr. 1	II	iP _{EN}	23 20 56.0	W-A	$\Delta = 244 \text{ km.}$ Felt in Western Kentucky.
			iEN	23 20 57.0	W-A	
			iS _{EN}	23 21 26.5	W-A	
			iS _{EN}	23 21 27.3	W-A	
			eL _{EN}	23 21 28.7	W-A; G-W	
			F	23 29 ±		
61	Apr. 3	I	eP _N	2 05 00	G-W	$\Delta_{S-P} \quad 49^{\circ}.6$
			iS _{EN}	2 12 07	G-W	
			iE	2 14 49	G-W	
			eM _{EN}	2 29 00	G-W	
			F	4 10 ±	G-W	
62	Apr. 3	I	eP _{EN}	5 29 58	W-A	$\Delta_{S-P} \quad 67^{\circ}.6$
			eS _{EN}	5 39 01	G-W	
			eM _E	5 57 30	G-W	
			F	6 45 ±	G-W	
63	Apr. 3	I	eP _Z	23 32 15	G-W	$\Delta_{S-P} \quad 72^{\circ}.4$
			iZ	23 34 36	G-W	
			eZ	23 36 31	G-W	
			iS _E	23 41 46	G-W	
			iE	23 42 32	G-W	
			iE _Z	23 47 07	G-W	
			eE _Z	23 44 42	G-W	
			iE	23 45 53	G-W	
			eL _E	23 48 41	G-W	
			F	25 10 ±	G-W	

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
64	Apr. 5	I	iP _{NZ}	5 08 53	W-A; G-W	$\Delta_{S-P} \quad 24^{\circ}.5$
			eS _N	5 13 06	G-W	
			eM _{EN}	5 19 31	G-W	
			F	5 40 \pm	G-W	
65	Apr. 6	II	iP _Z	7 04 24	G-W	Epicenter Caroline Islands $\Delta = 110^{\circ}$
			eE _Z	7 07 49	G-W	
			iP _{RIZ}	7 09 02	G-W	
			eE	7 15 45	G-W	
			iE _N	7 16 45	G-W	
			iP _{SEZ}	7 18 37	G-W	
			eE	7 19 51	G-W	
			iS _{RLEN}	7 24 35	G-W	
			eE _N	7 29 01	G-W	
			eL _{EZ}	7 42 31	G-W	
			eM _{EZ}	7 49 31	G-W	
			F	9 50 \pm	G-W	
			66	Apr. 6	II	
iP _{EN}	15 37 59.5	W-A				
iE	15 38 00.6	W-A				
iS _{EN}	15 38 29.3	W-A				
F	15 45 \pm	W-A				
67	Apr. 9	I	iP _Z	23 13 41	G-W	$\Delta_{S-P} \quad 80^{\circ}.9$
			iS _E	23 23 56	G-W	
			iE	23 24 19	G-W	
			eE _N	23 29 31	G-W	
			eL _E	23 42 01	G-W	
			F	24 25 \pm	G-W	
67	April 13		Moderate microseisms,			
68	Apr. 13	I	iP _{EN}	19 53 34	W-A	
			iS _E	19 53 35	W-A	
			F	19 55 \pm	W-A	

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
75	Apr. 24	I	e _Z	2 25 19	G-W; W-A	
			eS _N	2 29 41	G-W	
			F	3 20 ±	G-W	
76	Apr. 24	III	iP _Z	17 37 01	G-W	Epicenter Caroline Islands Δ = 110°
			eP _Z	17 40 31	G-W	
			iPR _{1EZ}	17 41 40	G-W	
			i _Z	17 44 01	G-W	
			iPR _{2Z}	17 44 26	G-W	
			iS _{cPcPcSE}	17 48 31	G-W	
			e _Z	17 51 01	G-W	
			iEZ	17 51 15	G-W	
			iPSE	17 51 45	G-W	
			iSR _{1E}	17 57 09	G-W	
			eSR _{2E}	18 01 31	G-W	
			eSR _{3E}	18 04 50	G-W	
			eME	18 16 01	G-W	
			F	21 45 ±	G-W	
77	Apr. 25	I	iS _N	11 08 50	G-W; W-A	Δ _{S-P} 25.3
			eS	11 13 09	G-W	
			F	11 40 ±	G-W	
78	Apr. 26	I	eP _Z	4 33 16	W-A	Δ _{S-P} 68°
			iP _Z	4 33 40	G-W	
			iS _{NN}	4 42 21	G-W; W-A	
			eL _{EN}	4 56 00	G-W	
			F	6 00 ±	G-W	
79	Apr. 27	I	e _N	17 03 20	G-W	Destructive in Transcaucasia. Epicenter about 39°N. 46°E.
			eEN	17 07 33	G-W	
			eE	17 13 35	G-W	
			iEN	17 14 30	G-W	
			iEN	17 15 04	G-W	
			i _N	17 16 12	G-W	
Gap in record 17-25 to 17-50 owing to change of record sheets.						
			F	19 40 ±		

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G. M. Time h. m. s.	Instruments	Remarks
80	May 1	I	iP _{NZ}	22 43 52	G-W;W-A	Compression Δ_{S-P} 35 ^o .7 Epicenter 8 ^o N. 70 ^o W.
			ePK _{LNZ}	22 45 10	G-W;W-A	
			iS _E	22 49 26	G-W	
			eSR _{LE}	22 51 53	G-W	
			eL _{EN}	22 53 30	G-W	
			iM _N	22 53 10	G-W	
			F	24 00 ±	G-W	
8.	May 3	No records 11 a.m. to 4 p.m.				
81	May 5	I	eN	12 18 13.6	W-A	Records fogged. Felt in Birmingham, Ala. $\Delta = 615$ km.
			eN	12 18 20.5	W-A	
			eN	12 18 25.2	W-A	
			iP _N	12 18 26	W-A	
			iN	12 19 33.6	W-A	
			iN	12 19 34.9	W-A	
			iN	12 19 38.3	W-A	
			iS _N	12 19 38.2	W-A	
F	12 25 ±	W-A				
82	May 9	I	eP _{EZ}	10 39 28	G-W	Δ_{S-P} 22 ^o .0 Epicenter 24 ^o N. 109 ^o W.
			eS _{EN}	10 43 22	G-W	
			iS _N	10 43 30	G-W	
			eL _E	10 45 00	G-W	
			iM _{EN}	10 46 00	G-W	
			F			
83	May 10	I	eW?	8 06 13	W-A	Local
			e _N	8 06 16	W-A	
			e _E	8 06 19	W-A	
			e _N	8 06 43	W-A	
			iS _N	8 06 46	W-A	
			e _{EN}	8 06 50	W-A	
			i _{EN}	8 06 51	W-A	
			F	8 08 ±	W-A	
May 10		Quake missed; no records 11 a.m. to 6 p.m.				

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
84	May 12	I	eP _{NZ}	1 48 24	G-W;W-A	Δ_{S-P} 69 ^o .3 Epicenter 54 ^o N. 161 ^o E.
			iP _Z	1 48 28	G-W	
			i _Z	1 48 41	G-W	
			i _Z	1 48 46	G-W	
			iS _E	1 57 38	G-W	
			i _E	1 58 11	G-W	
			cL _{EZ}	2 13 00	G-W	
			eL _{EZ}	2 17 10	G-W	
			F	3 45 ±	G-W	
85	May 13	I	eS _E ?	9 01 18	G-W;W-A	
			eL _E	9 23 30	G-W	
			F	9 50 ±	G-W	
87	May 14 May 16	No records from 11 a.m. to 7 p. m. on 15th. " " " " " to 4 p.m. "				
86	May 20	III	iP _E	2 32 35	W-A	Δ_{S-P} 56 ^o 5 Epicenter 37 ^o 5 N. 16 ^o 5 W.
			i _Z	2 33 20	G-W	
			i _{EZ}	2 34 15	G-W	
			eS _N	2 40 25	W-A	
			iS _N	2 40 29	G-W	
			i _N	2 46 26	G-W	
			i _N	2 47 04	G-W	
			iL _{NZ}	2 47 20	G-W	
			eL _{EZ}	2 52 00	G-W	
			F	6 30 ±	G-W	
87	May 20	I	iP _Z	22 05 00	G-W	Compression Δ_{S-P} 66 ^o 9 Epicenter 23 ^o 7 S. 72 ^o 5 W.
			eS _E	22 13 53	G-W	
			cL _{ENZ}	22 18 31	G-W	
			F	End covered by following		
88	May 20	I	eP _{NZ}	22 33 09	G-W;W-A	Δ_{S-P} 69 ^o
			eS _{EN}	22 41 21	G-W	
			F	24 00 ±	G-W	

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
89	May 27	I	eP _{NY}	6 10 49	W-A	Δ_{S-P} 67 ^o .6
			eS _E	6 19 52	G-W	
			eM _E	6 37 00	G-W	
			F	End covered by following		
90	May 27	I	iP _E	6 45 20	G-W	Compression Δ_{S-P} 64.3 Epicenter 56 ^o N. 133 ^o E.
			iS _N	6 54 01	G-W	
			eM _{EZ}	7 10 00	G-W	
			F	7 45 ±	G-W	
91	May 27	I	iP _N	10 26 12	W-A	Compression Dilatation Δ_{S-P} 23 ^o .7 Epicenter 18 ^o N. 102 ^o W.
			iP _Z	10 26 13	G-W	
			iS _E	10 30 19	G-W	
			eM _{EN}	10 34 30	G-W	
			F	11 10 ±	G-W	
May 27 No records from 11 a.m. to 2 p.m.						
92	May 28	I	eP _{NZ}	3 25 15	W-A; G-W	Δ_{S-P} 60 ^o .9
			e _{NZ}	3 25 43	G-W	
			eS _E	3 33 32	G-W	
			e _E	3 34 19	G-W	
			F	4 05 ±	G-W	
93	May 28	I	eP _{NZ}	18 45 21	G-W	Δ_{S-P} 67 ^o .8
			iS _E	18 54 35	G-W	
			eM _E	19 11 55	G-W	
			F	20 30 ±	G-W	
94	May 29	I	iP _{TN}	5 24 29	W-A	Δ_{S-P} 47 ^o Epicenter 52 ^o N. 156 ^o W.
			eS _E	5 31 16	G-W	
			e _{EN}	5 34 00	G-W	
			eM _E	5 38 30	G-W	
			F	6 05 ±	G-W	
95	May 30	I	eP _N	11 44 43	W-A	Δ_{S-P} 62 ^o .8 Epicenter 52 ^o N. 177 ^o E.
			eP _N	11 44 54	G-W; W-A	
			iS _E	11 53 19	G-W	
			eM _E	12 10 00	G-W	
			F	13 00 ±	G-W	

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
96	June 1	I	e _E	12 21 32	G-W	
			e _E	12 23 53	G-W	
			eM _E	12 50 17	G-W	
			F	13 30 ±	G-W	
97	June 1	I	i _N	20 45 40	W-A	
			F	20 55 ±	W-A	
98	June 4	I	i(PR ₁) _Z	10 11 36	G-W	
			i _Z	10 12 29	G-W	
			e(SR ₁) _N	10 29 35	G-W	
			e _E	11 07 00	G-W	
			i _E	11 10 30	G-W	
			i _Z	11 12 06	G-W	
			i _E	11 12 15	G-W	
			F	11 30 ±	G-W	
99	June 9	I	e(S) _E	12 34 43	G-W	
			eM _E	12 51 00	G-W	
			F	12 30 ±	G-W	
100	June 9	I	e(P) _Z	14 05 34	G-W	
			e(S) _E	14 16 12	G-W	
			eL _E	14 36 30	G-W	
			eM _E	14 40 00	G-W	
			F	Lost in changing record		
101	June 9	I	Beginning lost in changing record.			
			eL _E	16 50 31	G-W	
102	June 13	I	F	18 50 ±	G-W	
			e _{EN}	15 58 32	G-W	
			e _N	15 59 34	G-W	
			e _N	16 22 22	G-W	
			eM _{EN}	16 27 05	G-W	
F	18 15 ±	G-W				

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
103	June 15	I	iP _{NZ} eS _N e _E eM _E F	11 29 31 11 37 12 11 39 15 11 53 30 13 00 ±	G-W; W-A G-W G-W G-W G-W	$\Delta = 55^{\circ}1$
104	June 17	I	eP _N iS _{EN} eL _E F	12 22 48 12 33 17 12 41 00 13 30 ±	W-A G-W G-W G-W	$\Delta = 83^{\circ}6$
105	June 20	I	iP _N eS _{EN} F	1 27 28 1 36 32 2 10 ±	W-A G-W G-W	$\Delta = 67^{\circ}8$
106	June 20	I	i(P) _{NZ} e _N e(S) _N e _E e _{NZ} F	15 14 47 15 16 51 15 23 01 15 32 16 15 35 11 16 00 ±	G-W; W-A W-A G-W G-W G-W G-W	$\Delta = 60^{\circ}3$ Probably off Northern Coast of Chile.
107	June 21	I	eP _Z iPR _{1Z} iPR _{2Z} iS _N i _N iSR _{1N} eL _{EN} eM _{EN} F	12 28 33 12 29 09 12 29 19 12 32 59 12 33 09 12 34 08 12 35 16 12 36 36 13 40 ±	G-W G-W G-W G-W G-W G-W G-W G-W G-W	19°N. 110°W $\Delta = 26^{\circ}2$
			No records June 21st to		23rd.	
108	June 28	I	iP _{ENZ} eS _E eL _E eM _E F	16 37 55 16 46 57 16 59 00 17 04 31 17 30 ±	G-W; W-A G-W G-W G-W G-W	$\Delta = 67^{\circ}2$

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
109	June 29	I	iP _{NZ}	20 35 24	G-W;W-A	29°S.
			iP _{NZ}	20 35 35	G-W;W-A	72°W.
			iZ	20 35 39	G-W	$\Delta = 69^\circ$
			iS _{EN}	20 44 36	G-W;W-A	
			iS _E	20 44 49	G-W	
			iE	20 44 59	G-W	
			F	21 45 ±	G-W	

Besides the above, partial records of weak or distant quakes
 2d. 2.0-2.5h; 2d. 6.55-6.9; 5d. 3.6-3.7h; 7d. 0.88-1.1h; 11d. 19.5-
 20.3; 17d. 17.5-18.6h; 18d. 14.0-14.5h; 19d. 22.9-23.9h; 20d. 1.6-
 2.3h; 24d. 20.4-21.0h; 27d. 18.4-19.7h; 30d. 4.3-4.6h.

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BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
110	July 2	I	eEN	4 02 50	G-W	
			eEN	4 03 20	G-W	
			eLEN	4 26 00	G-W	
			F	5 00 ±	G-W	
111	July 7	I	iP _{NZ}	3 59 35	G-W; W-A	Epicenter 13°N. 94°W.
			iPR _{1Z}	4 00 12	G-W	
			i _N	4 00 31	G-W	
			iSENZ	4 03 58	G-W; W-A	Surface waves insignificant
			eSR _{1EN}	4 05 07	G-W	
			iSR _{3N}	4 05 40	W-A	
			F	5 15 ±		
112	July 9	I	eP _E	12 08 45	G-W	Epicenter 47°N. 28°W.
			eEZ	12 10 05	G-W	
			eS _E	12 15 35	G-W	
			eLENZ	12 22 30	G-W	
			eMENZ	12 27 00	G-W	
			F	12 50 ±	G-W	
113	July 9	I	eP _{NZ}	21 05 51	G-W	Δ _{S-P} 27°
			eS _N	21 10 23	G-W	
			eL _N	21 15 00	G-W	
			eM _{NZ}	21 20 10	G-W	
			F	21 40 ±	G-W	
114	July 11	I	e(P) _Z	6 04 56	G-W	
			e(S) _N	6 11 25	G-W	
			F	6 40 ±	G-W	
N.B. N-S component on short-period Wood Anderson not recording July 11 to 31.						
115	July 12	I	eENZ	17 04 31	G-W	Beginning ob- scured by changing records.
			e _N	17 50 31	G-W	
			e _E	17 35 39	G-W	
			e _E	17 42 31	G-W	
			F	19 30 ±	G-W	
July 15th. Earthquake at 11 a.m. missed by changing of record sheets.						

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
116	July 17	I	iP _Z	9 18 54	G-W	Epicenter: 14°5 N. 97°W.
			iPR ₁ NZ	9 19 25	G-W	
			iS _{EN}	9 23 09	G-W	
			i _{EN}	9 23 23	G-W	
			i _{EN}	9 23 51	G-W	
			iSR ₁ N	9 24 17	G-W	
			eL _{EN}	9 26 06	G-W	
			eM _{EN}	9 28 36	G-W	
F	11 15 ±	G-W				
117	July 18	I	iP _Z	5 37 27	G-W	Epicenter: 21°S. 71°W.
			i _Z	5 38 06	G-W	
			iS _E	5 45 55	G-W	
			i _E	5 46 38	G-W	
			i _E	5 48 02	G-W	
			F	6 40 ±	G-W	
118	July 18	I	iP _{ENZ}	11 34 52	G-W	Epicenter 58°3 N. 159°E.
			iS _{EN}	11 43 52	G-W	
			iSR ₁ EN	11 48 26	G-W	
			iSR ₂ EN	11 51 47	G-W	
			eL _{EN}	11 54 30	G-W	
			eM _E	11 59 30	G-W	
			F	13 45 ±	G-W	
119	July 18	I	e _E	14 45 55	W-A	Felt in New Madrid, Mo.
			e _E	14 45 57	W-A	
			eP _E	14 45 58	W-A	
			i _E	14 46 12	W-A	
			i _E	14 46 24	W-A	
			iS _E	14 46 27.7	W-A	
			i _E	14 46 29.6	W-A	
			F	14 53 ±	W-A	
120	July 19	I	eP _{EZ}	20 20 56	G-W; W-A	Δ _{S-P} 59°2
			eS _{EN}	20 29 03	G-W	
			eM _E	20 45 00	G-W	
End covered by following						
121	July 19	I	eP _E	20 53 25	W-A	Δ _{S-P} 59°2
			eS _{EN}	21 01 32	G-W	
			F	21 40 ±	G-W	

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
122	July 20	I	eP _Z eS _{EN} eL _{EZ} F	8 43 49 8 54 09 9 13 31 10 15 ±	G-W G-W G-W G-W	Δ_{S-P} 81°7
123	July 21	I	eP _Z iPR _{1EZ} iS _{cPcS} i _E i _N iPS _N F	3 50 42 3 55 14 4 01 03 4 02 03 4 02 47 4 03 59 5 15 ±	G-W W-A;G-W G-W G-W G-W G-W G-W	Epicenter determined by U.S.C.G.S. 22°S. 174°E.
124	July 23	I	eP _E e _N eS _{EN} End covered by following eP _N eS _N F	14 39 43 14 45 01 14 46 10 14 49 01 14 55 03 15 30 ±	W-A G-W W-A;G-W G-W G-W G-W	
125	July 27	I	eP _Z eS _N iS _{EN} eL _E F	7 21 13 7 25 06 7 25 15 7 26 52 8 20 ±	G-W G-W G-W G-W G-W	Δ_{S-P} 21°9
126	July 27	I	iP _{NZ} i _N iS _{EN} e _{EN} eL _N F	16 36 10 16 37 09 16 41 58 16 44 02 16 48 02 17 30 ±	G-W G-W G-W G-W G-W G-W	Δ_{S-P} 37°7

Besides the above, seismic movements at 1d.23.8h-24.5h; 2d.1.1h-2.0h; 2d.2.7h-3.2h; 2d.3.5h-5.0h; 3d.22.0h-23.2h; 5d.6.8h-7.0h; 5d.14.5h-15.2h; 5d. 15.5h-16.5h; 5d.19.5h-21.4h; 7d.21.3h-21.8h; 9d.12.1h-13.0h; 10d.20.1h-20.3h; 10d.21.7h-22.0h; 15d.16.5h-18.6h; 15d.18.7h-20.0h; 16d.21.3h-21.6h; 17d.23.5h-24.0h; 19d.10.1h-10.6h; 19d.11.4h-12.2h; 20d.3.7h-4.0h; 21d.12.3h-12.5h; 22s.20.1h-20.8h; 23d. 5.1h-7.2h; 25d. 22.1h-23.9h. 29d.18.1h-18.7h; 31d.23.9h-23.3h.

FLORISSANT

BULLETIN FOR 1931

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

No.	Date	Class	Station	Time			Instruments	Remarks
				h.	m.	s.		
127	Aug. 2	I	iP _{EZ}	23	40	43	G-W; W-A	
			e _{EZ}	23	47	34	G-W	
			iS _{EN}	23	49	49	G-W; W-A	
			F					
128	Aug. 6	II	eP _Z	18	28	39	W-A	
			eS _N	18	39	03	G-W	
			eL _{EN}	19	01	39	G-W	
			F	20	00	±	G-W	
129	Aug. 7	I	eP _Z	2	27	04	G-W	Near New Guinea
			e _Z	2	30	03	G-W	
			eE _Z	2	31	53	G-W	
			iP _{R₁Z}	2	31	59	G-W	
			i _N	2	39	12	G-W	
			iP _{SE}	2	41	48	G-W	
			iS _{R₁N}	2	48	26	G-W	
			eM _{EZ}	3	12	00	G-W	
F	6	10	±	G-W				
130	Aug. 9	I	eP _Z	1	35	25	G-W	
			eS _N	1	40	04	G-W	
			F	2	05	±	G-W	
131	Aug. 9	I	eP _{E?}	6	19	14.7	W-A	Felt in Kansas City and to the westward. Δ 405 km.
			e _E	6	19	41.4	W-A	
			i _E	6	19	51.8	W-A	
			i _E	6	19	53.8	W-A	
			iS _N	6	20	02.2	W-A	
			i _N	6	20	33.2	W-A	
			F	6	21	±	W-A	
132	Aug. 9	I	eP _E	7	06	06.4	W-A	Felt in Kansas City. Δ = 405 km. Amplitudes lower than in preceding.
			iP _E	7	06	07.3	W-A	
			eP _E	7	06	37.4	W-A	
			iE _N	7	07	14.6	W-A	
			iE _N	7	07	17.5	W-A	
			iS _{EN}	7	07	25.2	W-A	
			i _E	7	07	27.5	W-A	
			i	7	07	28.2	W-A	
			F	7	09	±	W-A	

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
133	Aug. 10	III	eP _{NZ}	21 32 04	G-W; W-A	Epicenter 49°N. 93°E.
			iP _Z	21 32 06	G-W	
			iZ	21 32 16	G-W	
			iPR _{1Z}	21 35 55	G-W	
			i _W	21 38 13	G-W	
			iS _C P _C S _W	21 42 31	G-W	
			i _N F	21 43 34	G-W; W-A	
134	Aug. 13	I	eP _Z	22 23 35	G-W	
			ePR _{1NZ}	22 27 46	G-W	
			e _{EN}	22 34 01	G-W	
			iS _{EN}	22 34 50	G-W	
			iPS _Z	22 37 08	G-W	
			eL _{EZ}	22 58 00	G-W	
			F	25 00 ±	G-W	
135	Aug. 15	I	i _E	17 56 37	W-A	
			i _E	17 56 41	W-A	
			i _E	17 56 43	W-A	
			F	17 58 ±	W-A	
136	Aug. 16	I	iP _{EZ}	8 11 20	G-W; W-A	
			iS _E	8 15 32	G-W	
			eM _{EZ}	8 30 40	G-W	
			F	9 35 ±	G-W	
137	Aug. 16	I	iP _E	11 18 14	W-A	Felt in Texas.
			iS _E	11 20 42	W-A	
			iM _E	11 22 19	W-A	
			F	11 35 ±	W-A	
138	Aug. 16	III	eP _E	11 43 40	W-A	Δ _{S-p} 13.4 Destructive in Texas. Epicenter 30°6 W. 103°8 N. End covered by following
			iP _E	11 43 41	W-A	
			i _{EN}	11 43 45	W-A	
			iS _N	11 46 14	W-A	
			F			

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
139	Aug. 16	I	e _{PN}	13 36 30	W-A	Felt in Western Texas.
			e _{SN}	13 38 56	W-A	
			F	13 45 ±	W-A	
140	Aug. 17	I	e _Z	13 23 52	G-W	
			e _{SEN}	13 27 47	G-W	
			e _{ME}	13 30 47	G-W	
			F	13 50 ±	G-W	
141	Aug. 18	II	i _{PZ}	14 34 21	G-W	
			i _{ScPcSE}	14 44 52	G-W	
			i _{EN}	14 45 28	G-W	
			i _{PSZ}	14 46 49	G-W	
			i _{EN}	14 52 03	G-W	
			e _{ME}	15 04 30	G-W	
			i _{ME}	15 13 30	G-W	
			F	19 15 ±	G-W	
142	Aug. 18	I	e _{PN}	19 39 36	W-A	Texas?
			e _{SN}	19 42 03	W-A	
			i _{MN}	19 43 43	W-A	
			F	20 05 ±	W-A	
143	Aug. 19	I	i _{EN} F	14 31 16	W-A	
144	Aug. 23	I	i _{PE}	18 07 25	W-A	
			i _{SN}	18 12 01	G-W	
			e _{LN}	18 15 30	G-W	
			e _{MEN}	18 16 43	G-W	
			F	19 30 ±	G-W	
145	Aug. 24	II	e _{PZ}	21 49 50	G-W	Epicenter: 30°N. 67°E.
			e _{PRINZ}	21 54 20	G-W	
			i _{NZ}	21 53 43	G-W	
			i _{ScPcSEN}	22 00 30	G-W	
			i _N	22 03 34	G-W	
			i _{MENZ}	22 40 34	G-W	
			F	26 00 ±	G-W	

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
146	Aug. 25	I	eP _{NZ}	22 26 21	G-W;W-A	
			eS _N	22 31 09	G-W	
			eM _{NZ}	22 37 54	G-W	
			F	23 15 ±	G-W	
147	Aug. 26	I	iP _N	21 39 31	W-A	
			iS _N	21 42 03	W-A	
			eI _N	21 43 10	W-A	
			F	21 50 ±	W-A	
148	Aug. 27	III	iP _Z	15 41 44	G-W	Epicenter 30°N. 67°E.
			iPP-1 _{NZ}	15 46 04	G-W	
			i _{NZ}	15 46 32	G-W	
			i _{NZ}	15 49 15	G-W	
			iS _C P _C S _{EN}	15 52 23	G-W	
			iS _C P _C P _C S _{EN}	15 53 16	G-W	
			i _N	15 54 08	G-W	
			iPS _Z	15 55 31	G-W	
			iE _N	15 56 15	G-W	
			iM _{ENZ}	16 33 45	G-W	
			F	20 30 ±	G-W	
149	Aug. 30	I	iP _Z	7 41 15	G-W	
			i _Z	7 42 15	G-W	
			eS _{EN}	7 46 20	G-W	
			eE _N	7 48 58	G-W	
			F	8 30 ±	G-W	
150	Aug. 31	I	eP _N	5 34 37	G-W	Local
			e _N	5 35 19	G-W	
			e _N	5 36 07	G-W	
			F	5 40 ±	G-W	

Besides the above, seismic movement at 1d.0.4h-1.1h; 1d.20.4h-21.5h; 2d.20.9h-21.2h; 5d.4.3h-4.8h; 5d.7.5h-8.0h; 5d.9.6h-10.0h; 5d.23.1h-23.6h; 6d.3.6h-3.8h; 8d.2.3h-3.1h; 8d.5.4h-5.7h; 8d.9.7h-10.2h; 8d.13.4h-13.6h; 8d.21.3h-21.7h; 10d.23.8h-24.5h; 10d.10.0h-11.0h; 11d.6.6h-7.3h; 14d.5.0h-5.0h; 16d.19.3h-20.5h; 17.9.8h-10.0h; 18d.6.1h-6.9h; 22d.22.9h-24.3h; 25d.19.9h-20.2h; 26d.20.5h-20.7h; 28d.1.6h-2.2h; 31d.6.9h-8.3h.

FLORISSANT

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

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

Note: During the months of September, October, and November the instruments were not in operation.

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
151	Dec.1	I	M	04 29 15	G-W	
			F	05 36 ±	G-W	
152	Dec.3	I	e _Z	10 36 13	G-W	
			i _Z	10 39 10	G-W	
			F	10 48 ±	G-W	
Heavy microseisms from Dec. 4 - Dec.6. Maximum Dec. 18th to 20th.						
153	Dec.10	I	i _{EN}	8 12 09	W-N	Local quake. Felt in Arkansas, U.S.A.
			iP _{EN}	8 11 14	W-N	
			e	8 12 35	W-N	
			e	8 12 42	W-N	
			iS [?] _{EN}	8 12 46	W-N	
			e _{EN}	8 13 00	W-N	
			e _{EN}	8 13 17	W-N	
			F	8 15 ±	W-N	
154	Dec.14	I	iP _Z	19 26 06	G-W	Δ_{S-P} 63 ^o .8
			iS _E	19 37 43	G-W	
			F	20 06 ±	G-W	
155	Dec.17	I	e _{EN}	3 36 34	W-A	Local quake. $\Delta = 479$ k. Felt in Mississippi
			e _{EN}	3 36 38	W-A	
			iP _{EN}	3 36 42	W-A	
			i _{EN}	3 36 44	W-A	
			i _{EN}	3 36 53	W-A	
			e _{EN}	3 36 54	W-A	
			e _{EN}	3 36 57	W-A	
			i _{EN}	3 37 23	W-A	
			i _{EN}	3 37 34	W-A	
			iS [?] _{EN}	3 37 39	W-A	
			F	3 45 ±	W-A	

BULLETIN FOR 1931

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
156	Dec. 18	I	e F	5 52 48 6 03 ±	G-W G-W	
157	Dec. 18	I	e _E i _Z L F	10 08 57 10 08 58 11 05 16 11 38 ±	G-W G-W G-W G-W	
158	Dec. 20	I	iP _{EZ} iS _Z F	15 05 11 15 11 10 15 16 30	G-W G-W G-W	Δ_{S-p} 39°.3 No surface waves.
Appears to be of the deep focus type of earthquake						
159	Dec. 22	I	M F	5 27 15 5 40 ±		
160	Dec. 24	I	i _{NZ} i _{NZ} i _N i _N i _Z M F	3 48 31 3 49 03 3 50 50 3 55 08 3 59 15 4 05 35 4 30 ±		
161	Dec. 25	I	M F	4 14 40 5 08 ±		
Considerable microseisms from Dec. 23 to Dec. 30. Seismic action was recorded on the following day. 1d. 18.3h-19.3h; 10d. 2.5h-2.8h; 28d. 11.4h-11.7h; 31d. 1.6h-2.4h.						