

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 January
1933

No.	Date	Char.	Phase	G. M. Time h. m. s.	Instruments	Remarks
1	January 5	I	iP _Z	2 5 05	G-W	$\Delta = 68^{\circ}3$
			iZ	2 6 45	G-W	
			iZ	2 7 23	G-W	
			iS _E	2 14 13	G-W	
			L _E	2 22 8	G-W	
			F	4 33 ±		
2	January 9	III	eP _Z	10 35 44	(Small G-W	Appears to be a deep focus earthquake. the phases were identified by means of F.J. Scrase's Tables. A depth of 400± km was assumed for this quake. The agreement is quite satisfactory $\Delta=102^{\circ}$ Epic. 11°S. 170°E.
			iP _Z	10 35 48	p Large G-W	
			ipP _Z	10 37 14	small G-W	
			ep ¹	10 39 27	surface G-W	
			ePR ₁ EZ	10 39 48	waves.) G-W	
			iS _c PEZ	10 40 28	G-W	
			iPeSEZ	10 40 50	G-W	
			ipPR ₁ Z	10 41 26	G-W	
			esPR ₁ Z	10 41 50	G-W	
			ePR ₂ Z	10 42 56	G-W	
			iS _c P _c S _E	10 45 44	G-W	
			iS _E	10 46 57	G-W	
			iSP _E Z	10 48 12	G-W	
			EPS _E	10 48 34	G-W	
			iSR ₁ ?	10 53 40	G-W	
isSR ₁	10 56 30	G-W				
Subsequent phases are obscured by the next quake.						
3	January 9	III	iP _{EZ}	10 50 14	G-W	An earthquake of probably a very deep focus. $\Delta - 74^{\circ}$.
			iPeP	10 50 40	G-W	
			ipPEZ	10 52 06	G-W	
			isP	10 52 42	G-W	
			iPR ₁ Z	10 53 35	G-W	
			iS _E	10 59 06	G-W	
The Land M waves coincide with those of previous quake.						
			F	13 10 ±		

		Phase	G.M. Time h. m. s.	Instruments	Remarks
4	January 13	Beginning lost in change of film.			
		M	16 45 30		
		F	17 30 \pm		
5	January 17	I	Clock out of order		
6	January 20	I	Clock out of order		
7	January 20	I	Clock out of order		
8	January 24	I	iP _{EZ}	4 02 37	G-W
			e? _E	4 03 34	G-W
			e _E	4 9 51	G-W
			e _E	4 12 00	G-W
			i _E	4 17 10	G-W
			i	4 17 54	G-W
			L	4 34 10	G-W
			F	6 20 \pm	
9	January 25	I	e _V	2 11 40	G-W
			e _V	2 20 42	G-W
			e _V	2 26 52	G-W
			L	2 47 5	G-W
			F	3 45 \pm	
10	January 27	I	i _E	19 56 8	G-W
			i _E	19 59 30	G-W
			F	20 25 \pm	
11	January 29	III	EP _{E-Z}	13 56 7	G-W
			iPR _{1E}	14 00 50	G-W
			i? _{EZ}	14 07 12	G-W
			i? _Z	14 08 25	G-W
			iPS _E	14 10 30	G-W
			i _Z	14 15 31	G-W
			iSR ₁	14 16 35	G-W
			i? _Z	14 20 01	G-w
			iSR ₂	14 20 26	G-W
			i? _E	14 24 54	G-W



No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
11	January 29	III	M F	14 39 36 18 45 15	G-W	
12	January 29	I	E _E E _E F	14 21 22 14 22 23 Lost in preceding quake	G-W G-W	

Besides the above, seismic action was recorded as follows: 2d.
 12.3h.-12.8h.: 18d. 7.6h.-7.8h.: 25d. 10.9h.-11.1h.: 25d. 23.8h.-
 23.9h.: 30d. 5.1h.-5.9h.: 9.1h.-1.6h.: 31d. 2.3h.-s.4h.: 31d.
 5.6h.-6.2h.

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

Lat. $38^{\circ} 48'.1$ N. Long. $90^{\circ} 22'.2$ W. 160 m.

BULLETIN FOR 1932

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
13	February 3 No. 1	III	eP _{ENZ}	03 21 01	G-W	O=06 ^h 15 ^m 51' G. M. T. $\Delta = 23^{\circ}.1$ Epic. $19^{\circ}.2$ N. 76° W. South of Santiago, Cuba.
			iP _{ENZ}	06 21 06	G-W	
			iPR _{1Z}	06 21 26	G-W	
			iPR _{2Z}	06 21 36	G-W	
			ePR _{3Z}	06 21 39	G-W	
			i?Z	06 24 19	G-W	
			iP _{CPE}	06 24 46	G-W	
			iS _{EN}	06 25 10	G-W	
			iSR _{1N}	06 26 03	G-W	
			iSR _{2N}	06 26 21	G-W	
			iSR _{2N}	06 26 30	G-W	
			i?EN	06 27 10	G-W	
			L	06 27 40	G-W	
			iP _{CSSP}	06 23 37	G-W	
			M	06 30 10	G-W	
			eS _C S	06 32 00	G-W	
			iP _{ESS_EP}	06 40 32	G-W	
			W ₂	09 10 27	G-W	
F	09 20 +					
14	February 3 No. 2	I	e _E End covered by next	09 24 40	W-A quake	
15	February 3 No. 3	I	e F Y	09 46 45 09 50 +		
16	February 3 No. 4	II	iP _E	12 41 39	G-W	$\Delta = 23^{\circ}$ after shock.
			ePR _{1N}	12 42 06	G-W	
			ePR ₂	12 42 13	G-W	
			iS _E	12 45 47	G-W	
			L	12 48 07	G-W	
F	13 04 +					

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
17	February 5	I	i _{EZ} i _{EZ} M F	3 36 37 3 41 13 8 42 35 8 47 \pm	G-W G-W G-W	
18	February 16	III	e _{PZ} e _Z e _{PR₁Z} i _{S_C^PC_S^N} i _{S_N} i _{PS_N} e _{PPS} i _{PCSSC_P^M} e _{SR₁E} e _{PPPS_E} e _{SR₂E} e _{SR₃E} i _L M ₁ M ₂ F	14 2 34 14 6 30 14 6 43 14 13 10 14 14 5 14 15 12 14 16 13 14 17 03 14 20 58 14 21 06 14 25 15 14 28 24 14 34 50 14 42 00 14 51 10 15 10 \pm	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	O = $13^{\text{h}}48^{\text{m}}50^{\text{s}}$ $\Delta = 97^{\circ}7$ Epic. $17^{\circ}7' S.$ 180° Fiji Islands
19	February 17 No. 1	I	E _Z e _L M F	00 2 18 00 19 8 00 38 00 1 15 \pm	G-W G-W G-W	
20	February 17 No. 2	I	i _{PE} i _{SE} e _L End lost in change of film.	16 13 08 16 18 20 16 20 33	G-W G-W G-W	S-P = $31^{\circ}1$ Epic. $13^{\circ}N.$ $71^{\circ}W.$
21	February 23	III	i _Z i _Z i _Z i _Z i	00 33 47 00 34 02 00 35 12 00 36 12 00 37 2	G-W G-W G-W G-W G-W	Deep quake.

Lat. 30 40.1 N.

Long. 90° 22.2 W.

160 m.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
21	February 23 continued	III	i _Z	00 38 15	G-W	
			i _Z	00 39 20	G-W	
			i _{EN}	00 43 27	G-W	
			i _{EN}	00 43 47	G-W	
			i _{EN}	00 45 20	G-W	
			i _E	00 46 00	G-W	
			i _{ENZ}	00 50 02	G-W	
			i _{LE}	01 05 02	G-W	
			M	01 09 48	G-W	
			F	02 48 ±		
22	February 23	I	e _Z	20 46 00		
			e _L	21 03 35		
			M	21 09 45		
			F	21 47 ±		

Seismic action was recorded on the following day.

February 5d. 15.75h-19.19h., 5d. 19.19h-20.1h, 12d. 1.4h-2.7h., 13d. 3.5h-3.6h, 13d. 19.2h-19.5h, 14d. 0.1h-0.2., 14d 2.5h-2.3h, 14d. 12.6h-.3.3h, 16d. 13.9-14.1h, 17d. 23.4h-23.9h, 22d. 6.5h-6.9h.

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7.

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

 Lat. $38^{\circ} 43.1' N.$

 Long. $90^{\circ} 22.2' W.$

160 m.

Subsoil, Hard Clay.

BULLETIN FOR MARCH, 1932

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
23	March 2	I	eP _n eS _n eL M F	17 47 02 52 07 55 57 40 18 14 ±	G-W G-W G-W G-W	$\Delta_{S-P} = 30^{\circ}$
24	March 8	I	iP _n i iS _n i L M F	4 39 41 40 15 47 43 49 31 58 5 03 36 35 ±	G-W G-W G-W G-W G-W G-W	$\Delta = 57^{\circ}5$
25	March 8	I	e _e M F	18 28 12 52 30 19 35 ±	G-W G-W	Deep focus earthquake.
26	March 9	I	e _e M F	3 06 05 07 50 13 ±	G-W G-W	
27	March 10	I	iP _{en} i iS _n ? i F	23 06 12 06 50 10 03 10 51 12 50	G-W G-W G-W G-W G-W	Deep. Much obscured by micro- seisms.
28	March 14	I	iP _{enz} iPR _{1n} iPR _{2z} ePR _{3n} iP _c Pen	4 11 06 11 34 11 42 12 48 14 45	G-W G-W G-W G-W G-W	$\Delta_{S-P} = 24^{\circ}$ Epicenter $5^{\circ}N. 110^{\circ}W.$ $O = 4^{h}5^{m}38^{s}.$



No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
28	March 14 (continued)	I	iS _{en} iSR _{1e} iSR _{2n} eSR _{3n} iP _c S _e eL M ₁ M ₂ iS _c S _n iP _c SS _c P _n F	4 15 22 16 23 16 40 16 55 17 30 17 50 18 40 20 25 21 50 30 00 5 30 ±	G-W G-W G-W G-W G-W G-W G-W G-W G-W G-W	
29	March 14	I	iP _{enz} ePR _{1z} ePR _{2e} ePR _{3z} eP _c P _z iS _{en} iP _c S _e iSR _{1e} iSR _{2e} iSR _{3n} eL iS _c S _e M ₁ M ₂ eP _c SS _c P M ₃ F	22 49 44 50 45 51 08 51 13 51 23 55 11 56 12 57 10 57 43 58 03 58 10 23 00 12 02 50 06 25 08 00 10 03 24 15 ±	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	$\Delta_{S-P} = 33.2$ Epicenter 9°7 N. 72°W. O = 22 ^h 42 ^m 55 ^s . U.S.C.G.S. gives 7°N. 73°W.
30	March 19	I	eP _z i _e i _e iS? M F	11 13 44 24 21 24 50 24 52 56 00 13 00	G-W G-W G-W G-W G-W	Deen
31	March 26	I	iP _{enz} iP _c P _e iPR _{1z}	00 06 42 03 21 08 29	G-W G-W G-W	$\Delta_{S-P} = 43.7$ Epicenter 61°N. 151°W. in Alaska. O = 5 ^h 58 ^m 29 ^s .

Florissant Bulletin

 Lat. $38^{\circ} 48'.1$ N:

 Long. $90^{\circ} 22'.2$ W. Height 160 m.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
31	March 26 (continued)	I	iPR _{2z}	00 09 05	G-W	
			iPR _{3z}	09 22	G-W	
			iP _C S _n	12 28	G-W	
			iS _{en}	13 21	G-W	
			iP _S _e	13 28	G-W	
			iSR _{1m}	16 34	G-W	
			iS _C S	16 39	G-W	
			iSR _{2en}	17 39	G-W	
			eSR _{3e}	18 04	G-W	
			eL	20 ±	G-W	
			eP _C SS _C P	23 45	G-W	
			M ₁	24 10		
			F	3 10 ±		
32	March 26	I	eP _{en}	10 08 22	G-W	$\Delta = 132^{\circ}$
			iP _e	11 37	G-W	
			iPR _{1e}	13 43	G-W	
			iS _C P _C P _e	15 00	G-W	
			iPR ₂	16 54	G-W	
			iS _C P _C S _e	18 50	G-W	
			iPR _{2e}	19 40	G-W	
			iP _S _e	24 30	G-W	
			iPPS	35 40	G-W	

Seismic action was recorded on the following days:

 15d. 5.3-6.3h, 16d. 21.3-21.4h, 23.4-23.5h, 18d. 6.3-7.1h,
 20d. 0.2-0.8h, 29d. 1.2-2.6h, 29d. 0.8-0.8h, 4.1-4.2h, 30d. 18.4-
 18.8h, 19.6-20.3h, 31d. 19.2-19.4h.

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BULLETIN FOR APRIL, 1932

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
33	April 3	I	ez	20 57 30	G-W	Normal Depth. $\Delta = 92^{\circ}.5$? Epicenter Korea?
			ePR _{2Z}	58 00	G-W	
			eS _e	21 03 48	G-W	
			iPS _e	04 42	G-W	
			iENZ	07 00	G-W	
			eSR _{1N}	10 15	G-W	
			eP _C SS _C P _E	10 55	G-W	
			eSR _{2E}	14 45	G-W	
			eSR _{3E}	16 55	G-W	
			M	32 00	G-W	
			F	22 10 ±		
34	April 4	I	eP _{ENZ}	14 33 22	G-W	Deep focus. $\Delta = 38^{\circ}$ Epicenter probably in Columbia. <u>L</u> waves very small.
			iP _{ENZ}	33 29	G-W	
			iPR _{1NZ}	34 42	G-W	
			ePR _{2Z}	35 03	G-W	
			iP _C P _Z	35 50	G-W	
			iS _{EN}	39 21	G-W	
			iP _C S _{EN}	39 52	G-W	
			iSS _{EN}	40 15	G-W	
			iSR _{1EN}	41 38	G-W	
			iSSR _{1EN}	42 18	G-W	
			iSR _{2EN}	42 35	G-W	
			iS _C S _{EN}	43 00	G-W	
			35	April 13	I	
ePR _{1Z}	12 00	G-W				
iS _C P _C S ?	17 52	G-W				
i? _{EN}	19 50	G-W				
iPS _{EN}	21 53	G-W				
eSR _{1E}	27 23	G-W				
L	47 +					
M	54 00					
F	2 10 ±					

ng. $90^{\circ} 23.2' W$. Height 160 m.

Florissant Bulletin, 1932

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
36	April 14	I	e _{EN} i _{EN} i _{EN} i _{EN} M ₁ M ₂ F	01 55 30 55 42 59 13 02 00 00 02 31 04 20 02 27 ±	G-W G-W G-W G-W G-W G-W	
37	April 16	I	i _{EN} i _{EN} i _{EN} i _{EN} i _{EN} i _{EN} M F	03 05 39 06 30 08 39 09 23 10 03 11 17 12 30 03 40 ±	G-W G-W G-W G-W G-W G-W G-W	
38	April 22	I	iP _Z iS _Z F	05 17 35 32 40 34 ±	G-W G-W	
39	April 22	I	M M F	06 20 00 24 00 07 02 ±	G-W G-W	
40	April 24	I	iPENZ iS _{EN} iSR _{1E} eSR _{2E} L M F	06 15 56 19 54 20 45 21 01 22 11 24 30 07 14 ±	G-W G-W G-W G-W G-W G-W	$\Delta_{S-P} = 21.9$ $\theta = 6^h 10^m 58^s$. Epicenter: $26^{\circ}N. 112^{\circ}W$. Lower California
41	April 26	I	iP _Z epP _Z esP _Z ? ePR _{1Z} iS _{EN}	08 05 33 06 30 06 44 08 30 14 20	G-W G-W G-W G-W G-W	Deep focus. $\Delta = 66 S$. Epicenter: $25^{\circ}S. 70^{\circ}W$.

Lat. 30 40.1 N. Long. 90° 23.3 W. Height 160 m.

Florissant Bulletin, 1932

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
41	April 26	I	ePS _N	08 15 03	G-W	
			isS _{EN}	15 30	G-W	
			eSR _{1E}	18 39	G-W	
			esSR	20 12	G-W	
42	April 29	I	iP _{ENZ}	18 13 29	G-W	Deep focus. Aleutian Island. Δ about 61°.
			eP _{CPN}	14 22	W-A	
			e _p P _Z	14 38	G-W	
			ePR _{1Z}	16 20	W-A	
			iS _{EN}	21 34	G-W	
			isS _E	22 16	G-W	
			iSR	26 10	G-W	

Seismic action was recorded on the following days: 5d. 0.1h-0.2h, 22.6h-22.9h; 6d. 10h-10.3h, 14.4h-14.5h; 7d. 10.4h-16.6h; 8d. 12.6h-13.4h, 22.9h-23.2h; 18d. 13.4h-13.9h; 19d. 22.4h-22.6h; 22d. 6.2h-6.6h; 22d; 8.0h-8.1h; 25d. 7.9h-8.5h.

FLORISSANT

13.

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 1932

 Lat. $38^{\circ} 43'.1$ N. Long. $90^{\circ} 22'.2$ W. Height 160 m. Hard Clay.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
43	May 1	I	eE	4 44 10	G-W	
			eE	4 47 00	G-W	
			eE	4 50 49	G-W	
			M	5 15 00		
			F	5 40 $\frac{+}{-}$		
44	May 1	I	iPENZ	19 14 12	G-W	$\Delta_{S-P} = 16.99$
			eSEN	19 17 24	G-W	
			iE	19 17 47	G-W	
			iE	19 18 40	G-W	
			iPcP	19 18 52	G-W	
			L	19 19 02		
			M	19 20 30		
			F	20 15 $\frac{+}{-}$		
45	May 4	I	eE	7 06 20	G-W	
			e	7 06 57	G-W	
			F	7 10 $\frac{+}{-}$		
46	May 14	I	iPENZ	13 27 08	G-W	An earthquake of greatest intensity probably deeper than normal. Epic. 1.3 N. 124 E. $0 = 13^h 10^m 53^s$. $\Delta = 129.3$ M waves have smaller amplitude than the preliminary phases.
			iP ₁ LNZ	13 30 10	G-W	
			iPR ₁ NZ	13 32 19	G-W	
			i _e N	13 33 35	G-W	
			iScPcS _e N	13 37 00	G-W	
			iPPS	13 44 00	G-W	
			iSR ₁ eN	13 49 $\frac{+}{-}$	G-W	
			iP ₃	13 50 40	G-W	
			iSR ₃	13 55		
			F	18 10 $\frac{+}{-}$		
47	May 21	I	iPENZ	10 15 36	G-W	$0 = 10^h 10^m 17^s$. Δ meas. $0.24.7$ Epic. 13.8 N. 88.5 W. in the state of Honduras.
			iPR ₁ EN	10 16 07	G-W	
			iPR ₂ N	10 16 17	G-W	
			iPcP _E	10 19 17	G-W	
			iSE	10 19 53	G-W	
			iSR ₁ E	10 20 43	G-W	
			iSR ₂ E	10 20 47	G-W	
			L	10 22 40		
			M	10 25 40		
W	13 18 $\frac{+}{-}$					
F	13 44 $\frac{+}{-}$					

Florissant Bulletin for 1932

Lat. 33° 48.1 N. Long. 90° 22.2 W. Height 160 m. Hard Clay.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
48	May 22	I	iP _Z	11 42 53	G-W	
			i _N	11 54 23	G-W	
			i _N	11 57 00	G-W	
			i	12 00 01	G-W	
			F	14 10 ±		
49	May 22	I	iP _Z	22 45 18	G-W	Deep. Δ = 25° 20' Epic. 14° N. 38.5 W.
			ipP _Z	22 45 37	G-W	
			isP _Z	22 45 59	G-W	
			iS _{eN}	22 49 39	G-W	
			iS	22 49 43	G-W	
			L	22 53 ±		
			F	23 20 ±		
50	May 26	I	eP _{ENZ}	16 22 52	G-W	Very deep. Epic. 22.7° S. 180° E. O = 16 ^h 9 ^m 40 ^s . The interval of two minutes be- tween P and pP places the focus at a depth of about 600 ± km. L and M waves compara- tively small.
			iP _Z	16 23 08	G-W	
			ipP _Z	16 25 06	G-W	
			isP _Z	16 26 03	G-W	
			iP _Z	16 26 30	G-W	
			iPR _{1Z}	16 27 20	G-W	
			ipPR _{1Z}	16 29 18	G-W	
			isPR _{1Z}	16 29 50	G-W	
			iPR _{2Z}	16 30 18	G-W	
			ipPR _{2Z}	16 32 02	G-W	
			iScPcS _E	16 32 40	G-W	
			isPR _{2Z}	16 32 40	G-W	
			iScPcPcS	16 33 40	G-W	
			iS _{EN}	16 34 20	G-W	
			iSP _{EN}	16 36 01	G-W	
			iPS _{EN}	16 36 35	G-W	
			ipS _{EN}	16 37 05	G-W	
			isS _{EN}	16 38 00	G-W	
			iPcScP _Z ?	16 38 40	G-W	
			iPcPcPcP _Z ?	16 39 40	G-W	
			i?Z	16 40 10	G-W	
			iSR _{1EN}	16 41 00	G-W	
			ipSR _{1E}	16 43 12	G-W	
			isSR _{1E}	16 44 30	G-W	
			iSR _{2EN}	16 45 55	G-W	
			F	19 30 ±		

Florissant Bulletin for 1932

Lat. 38° 48.1 N. Long. 90° 22.2 W. Height 160 m. Hard Clay.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
51	May 28	I	eP _{NZ}	2 39 22	G-W	
			iN	2 45 52	G-W	
			iE	2 47 02	G-W	
			F	4 20		
52	May 30	I	iP _Z	00 32 40	G-W	Deep. No surface waves.
			ipP	00 33 22	G-W	
			iSE	00 40 51	G-W	
			sS _E	00 41 33	G-W	
			i	00 43 13	G-W	

Seismic activity: 5d. 9.3h-9.8h; 6d. 4.9h-5.1h; 7d. 11.4h-11.5h; 31d. 8.9h-9.4h.

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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

SUPPLEMENT FOR 1962
 Lat. $38^{\circ} 48.1$ N. Long. $90^{\circ} 22.2$ W. Height 160 m. Hard Clay.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
53	June 3	I	iP _{ENZ} Too violent to be recorded. O = 10-36-25. F	10 41 53 16 ±	G	Epicenter: 16° N. 104° W. Δ 25.7
54	June 3	I	iP _{EZ} iS _{EN} iM _{ENZ} F	15 01 17 05 46 10 49 follows.	G G	Δ S-P 25.6 After shock.
55	June 3	I	iP _N iS _{EN} iM _{NZ} F	15 13 48 18 02 22 12 50 ±	W-A G	Δ S-P 23.7
56	June 3	I	eP _E iS _{EN} iM _{EZ} F	16 57 53 17 02 08 05 24 30 ±	G G G	Δ S-P 23.8
57	June 3	I	iP _{ENZ} iS eM _E F	17 45 07 49 28 55 05 18 50 ±	G G G	Δ S-P 24.6
58	June 3	I	eP _{EN} eS _N L _E F	20 05 08 09 23 12 42 follows.	G G	Δ S-P 23.8
59	June 3	I	iP _N eS _E eM _N F	20 16 59 21 12 26 04 45 ±	W-A G W-A	Δ S-P 23.6
60	June 4	I	eP _E eS _E eM _E F	2 37 13 41 29 46 32 3 10 ±	G G G	Δ S-P 24.0

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
61	June 4	I	eP _N eS _{EN} iM _{EN} F	3 56 25 4 00 39 04 12 10 ±	G G G	△ _{S-P} 23 ⁰ .7
62	June 4	I	eP _N iS _N eM _N F	5 20 23 25 20 33 15 55 ±	W-A G W-A	△ _{S-P} 26 ⁰ .5
63	June 4	I	eP _N eS _{NZ} eM _{TE} F	10 44 43 49 05 52 10 11 15 ±	G G G	△ _{S-P} 24 ⁰ .7
64	June 4	I	eP _{ENZ} eS _{EN} eM _{EN} F	16 05 15 08 45 12 38 20 ±	G G G	△ _{S-P} 19 ⁰
65	June 6	I	eP _{ENZ} iP _Z iPR _{1Z} iPR _{1Z} PcP _Z iS _{EN} iSR _{1EN} PcS M F	8 49 56 50 00 50 22 52 40 53 30 54 28 55 22 53 11 58 56 follows	G G G G G G G W-A W-A	△ _{S-P} 25 ⁰ .5
66	June 6	I	iP _{ENZ} iS _{EN} iM _N F	9 17 33 21 48 24 08 11 25 ±	G G W-A	△ _{S-P} 23 ⁰ .8
67	June 6	I	eP _{ENZ} eS _{EZ} iM _Z F	11 54 50 59 03 12 01 35 35 ±	G G G	△ _{S-P} 23 ⁰ .6 Epicenter: 18 ⁰ .6 N. 77 ⁰ .1 W. O= 11-49-52.

Florissant Bulletin for 1932

Lat 38° 48.1 N. Long. 90° 22.2 W. Height 160 m. Hard Clay.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
68	June 8	I	e _{ENZ} e _{ENZ} i _{ENZ} F	5 01 40 08 29 17 18 40 ±	G G G	△ _{S-P} 45° ⁰ .3
69	June 8	I	i _{PZN} i _{SENZ} i _{MENZ} F	8 00 52 07 24 16 39 40 ±	G W-GA W-A G	△ _{S-P} 42° ⁰ .7
70	June 8	I	e _{PEN} i _{SENZ} i _{MNZ} F	10 42 04 46 31 51 34 11 10 ±	G G G	△ _{S-P} 25° ⁰ .4
71	June 9	I	i _{PENZ} e _{SNZ} e _{LE} F	4 40 48 44 55 47 15 5 45 ±	G G G	△ _{S-P} 23° ⁰ .7
72	June 10	I	i _{PN} i _{SN} e _{MNZ} F	3 17 36 22 16 26 11 40 ±	W-A G G	△ _{S-P} 26° ⁰ .8
73	June 10	I	e _{PN} i _{SN} i _{MEN} F	21 34 25 38 35 42 10 22 10 ±	G G	△ _{S-P} 23° ⁰ .3
74	June 10	I	i _{PZ} S F	23 04 58 13 04 20 ±	G G	△ _{S-P} 53°
75	June 14	I	i _{PE} i _{SE} F	6 19 18 24 58 7 15 ±	G G	△ _{S-P} 35° ⁰ .2
76	June 16	I	e _E i _Z i _Z	1 33 04 33 23 40 50	G G G	

Florissant Bulletin for 1932

Long. 90° 22.2 W. Height 160 m. Hard Clay.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
76	June 16	I	iZ iZ iN iN F	1 41 30 42 07 47 38 58 43 3 30 00	G G G G	
77	June 18	I		10 17 11 Too violent to be recorded;		$\Delta 23^\circ$ Epicenter: 18.8 N. 104.5 W. 0=10-12-36.
78	June 18	I	iPZ iS _N iZ F	22 04 18 08 31 13 49 40 ±	G G G	$\Delta_{S-P} 23.6$
79	June 19	I	eP _N eS _N iN eN F	8 46 40 50 56 54 40 56 25 9 15 ±	G W-A G G	$\Delta_{S-P} 24^\circ$
80	June 20	I	iPZ eS	9 07 20 11 43	G G	$\Delta_{S-P} 24.8$ Epicenter: 13°N. 88.5 W. 0=9-02-00.
81	June 20	I	iP _N iN iSE iZ F	9 32 15 37 13 37 33 40 14 10 30 ±	G G G G	$\Delta_{S-P} 31.8$ Epicenter: 44°N. 126°W. 0=9-26-46.
82	June 22	I	iP _{EZ} iN iN iS _N	13 04 30 04 40 04 51 09 03	W-A W-A W-A W-A	$\Delta_{S-P} 26^\circ$ Great intensity. Epicenter: 17.3 N. 103.5 W. 0=12-59-18. Off
The subsequent phases were too violent to be recorded. Mexico.						
83	June 22	I	iP _E eS _E iL _{EZ} F	16 53 45 57 44 17 01 38 30 ±	G G G	$\Delta_{S-P} 22^\circ$

Florissant Bulletin for 1932

Lat. $38^{\circ} 43.1' N.$ Long. $90^{\circ} 22.2' W.$ Height 160 m. Hard Clay.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instruments	Remarks
84	June 24	I	iP _Z eS _I F	9 43 06 53 47 10 15	G G	\triangle S-P 27°

Besides the above, seismic activity at : 5d. 18.8h-19.3h; 9d. 3.4h-4.1h; 9d. 22h-22.5h; 10d. 12.5h-13h; 12d. 3h-3.5h; 13d. 21.5h-22.5h; 14d. 20.9h-21.5h; 27d. 9.1h-9.5h.

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SEISMOGRAPHIC STATION, ST. LOUIS UNIVERSITY, ST. LOUIS, MO., U. S. A. 21.

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

Lat. $38^{\circ} 43'1''$ N. Long. $90^{\circ} 22'2''$ W, Height 160 m. Hard Clay

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instrument	Remarks
85	July 3	I	eP _{EN} iS _N F	17 40 05 17 47 22 17 50 \pm		$\Delta = 50^{\circ}$
	July 5		Seismic motion at approx. 7-10			(G.M.T.)
	July 5		Seismic motion. Time not determinable.			
86	July 6	I	iP _{EN} eS _{EN} eM _{EN} F	15 12 21 15 16 43 15 20 15 30 \pm		
87	July 7	II	iP _{ENZ} i _{JEN} iS _{JEN} iL _N F	16 20 37 16 20 43 16 24 39 16 26 25 18 30 \pm		$\Delta = 22^{\circ}3$ Epicenter: 28° N. $113^{\circ}5$ W
	July 9		Emergent phases beginning at approx. 13-15. Lasted until about 13.55.			
	July 10		Seismic motion beginning about 00-55. Record very indistinct.			
88	July 10	I	iP _{EN} eS _{EN} eM _{EN} F	7 57 57 8 08 25 8 29 9 30 \pm		$\Delta = 84^{\circ}1$
89	July 12		e _E eL _E F	3 07 33 3 17 03 3 30 \pm		
90	July 12	I	eP _{EN} eS _{EN} eL _{EN} F	13 57 30 14 01 50 14 07 05 14 25 \pm		$\Delta = 24^{\circ}5$

Florissant Bulletin for 1932

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instrument	Remarks
91	July 12	II	iP _{EN}	19 23 53		$\Delta = 21^{\circ}7$ Epicenter: 25.6 N. 110.5W.
			iS _{EN}	19 32 49		
			iL _{EN}	19 34 29		
			iM _{EN}	19 35 35		
			F	22 30 \pm		
92	July 13	I	eP _E	2 31 24		$\Delta = 23^{\circ}8$
			eS _E	2 35 39		
			eL _{EN}	2 37 52		
			F	2 52 \pm		
	July 13		Corresponding to the St. Louis records. Time uncertain.			
93	July 16	I	eP _{EN}	23 35 52		May be only the long waves of the quake shown on the St. Louis records begin- ning at 23-33-00
			eS _N	23 36 02		
			eL _{EN}	23 37 30 (± 10)		
			F	23 50 \pm		
94	July 17	I	e _{EN}	00 41 35		Probably only the emergent phases showing
			eL _{EN}	00 45 30		
			F	00 55 \pm		
95	July 20	I	eS _{EN}	3 01 14		$\Delta = 21.4$ from the St. Louis records. Phases on these records are indistinct.
			eL _{EN}	3 04		
			F	3 20 \pm		
	July 20	I	Emergent phases which correspond to the St. Louis records. They center about 20-30.			
	July 21	I	Emergent phases centering about 00-20-00.			
	July 21	I	Emergent phases beginning at about 12-56-14 F 15-00-00.			
	July 22	I	Emergent phases beginning at 10-06-30 and ending at about 11-00-00.			
	July 22	I	Emergent phases beginning at about 12-00-00 and lasting until about 14-00-00.			

Florissant Bulletin for 1932

Lat. $38^{\circ} 48'1''$ N. Long. $90^{\circ} 22'2''$ W. Height 160 m. Hard Clay

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instrument	Remarks
	July 25	I	Emergent phases centering about 8-45. No surface waves.			
96	July 25	II	iP _{EN}	9 17 55		$\Delta = 23.3$ Epicenter $17^{\circ}2'N$ $104^{\circ}0'W$.
			i _{EN}	9 18 03		
			iPR _{LEN}	9 13 26		
			iS _{EN}	9 22 05		
			iM _{EN}	9 26 13		
			F	covered by the following		
	July 25	I	Emergent phases beginning at about 9-34- 50(± 2). Phases indistinguishable on these records.			
	July 30	I	Emergent phases beginning at 7-25-47. Indistinct.			
	July 30	I	Emergent phases beginning at approx. 21.17.			

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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 1932

Lat. $33^{\circ} 43.1$ N. Long. $90^{\circ} 22.2$ W. Height 160 m. Hard Clay.

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instrument	Remarks
	September 3	I	Seismic motion (BW) about 12.5h. Indistinct.			
	September 4		Seismic motion at 13h. (G.M.T.)			
	September 5		Seismic motion at 4h. (G.M.T.) Indistinct.			
97	September 8	I	iP _{ENZ} iS _{EN} eL _{EN} iM _{EN} F	1 46 16.5 1 50 33.0 1 53 56 1 56 50 2 20 ±	W-G W-G W-G W-G	△ _{S-P} 24 ^o .7
	September 9		Activity early on the 9th.			
98	September 14	I	eP _{ENZ} iN iP _{RLEN} eS _{EN} eSR _{LEN} eM _{EN} F	7 51 03 7 51 23 7 54 01 7 57 25 8 00 27 8 06 05 8 30 ±	W-G W-G W-G W-G W-G W-G	△ _{S-P} 40 ^o .7 Epicenter: 61 ^o N. 146 ^o W. Probably moderately deep.
99	September 15	II	e _{NI} eScPcPcS _{EN} e _{EN} eSR _{LEN} eL _{EN} eW _{2EN} F	14 21 16 14 21 50 14 24 10 14 29 53 14 57 22 16 07 04 16 40 ±	W-G W-G W-G W-G W-G W-G	Quake reported at Hawke Bay, New Zealand
100	September 23	I	iP _{ENZ} i _{EN} ip _{PEN} is _{SEN} iS _{EN} i _{EN}	14 34 19 14 34 20.5 14 35 21 14 36 01 14 44 19.5 14 46 22	W-G W-G W-G W-G W-G W-G	△ _{S-P} 37 ^o .3 (Scrase and Stechschulte) △ _{meas.} 33 ^o .0
	September 25		Seismic motion centering at 9.7 h. (G.M.T.)			

Florissant Bulletin for 1932

Lat. $33^{\circ} 48.1' N.$ Long. $90^{\circ} 22.2' W.$ Height 160 m. Hard Clay

No.	Date	Char.	Phase	G.M. Time h. m. s.	Instrument	Remarks
101	September 26	I	e _P EN	19 33 01	W-G	△ S-P 81.1
			i _S N	19 43 12	W-G	
			e _L E	19 52 38	W-G	
			F	21 00		
102	September 29	I	e _{EN}	4 09 34	W-G	
			e _L EN	4 39	W-G	
			F	4 54		
103	September 29	I	e _P ENZ	17 58 30	W-G	△ S-P 77.1
			e _S F(?)	18 03 21	W-G	

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

BULLETIN FOR 1952

No.	Date	Inst.	C/D	Phase	G.M.C.T.	S-P	Δ	P-0	O--remarks
104	October 2	W-A		iPN	3-04-57	4'49"	27°9	5'50"	Tentative epicenter: 10°9 N., 86°5 W. 0=2h59m07s
		W-A		iPR ₁ N	3-05-48				
		W-A		ePR ₂ N	3-06-03				
		W-G		eSEN	3-09-45				
		W-G		eSR ₁ EN	3-11-15				
		W-G		eSR ₂ EN	3-11-39				
		W-G		eLEN	3-12-49				
				F	3-40				
	October 3	Seismic activity centering around				1-30.			
	October 9	Seismic activity centering around				1-10.			
	October 9	Seismic activity centering around				23-10.			
105	October 11	W-G		ePEN	19-13-05	3'54"	21°4	4'43"	19h08m22s Tentative epicenter: 25° N., 110°W.
		W-G		iSEN	19-17-01				
		W-G		iLEN	19-19-07				
		W-G		eM ₁ EN	19-21-30				
				F	20-04				
106	October 15	W-G		eP EN	19-45-57	4'17"	24°1	5'12"	19h40m45s
		W-G		eSEN	19-50-14				
				F	20				
107	October 16	W-G		ePEN	12-16-41	6'55"	46°3	8'24"	12h03m17s
		W-G		iP ₁ EN	12-16-48				
		W-G		iSEN	12-23-37	6'56"	46°3	8'25"	12h03m23s Tentative epicenter: 5°0 N., 155° W. Two shocks.
		W-G		eS _N	12-23-43				
		W-G		ePS ₁ EN	12-23-49				
		W-G		i ₁ EN	12-26-30				
		W-G		eLEN	12-31				
		W-G		eM ₁ EN	12-34				
				F	13-00				
	October 17	Emergent phases beginning at approximately				12-57			
		and lasting until				13-00.			
	October 17	Emergent phases beginning at approximately				13-24			
		and lasting until				14-15.			

Florissant Bulletin for 1932

No.	Date	Inst.	C/D	Phase	G.M.C.T.	S-P	Δ	P-O	0--Remarks
	October 20	Seismic activity centering at about 19-00.							
108	October 24	W-G		iP _{EN} iS _E	12-11-26 12-13-29	iS-iP 7'03"	4797	8'34"	Probably deep. 0-12-03-52
	October 25	Seismic activity centering at about 18-40.							
	October 27	Seismic activity centering at about 10-15.							
109	October 29	W-G W-G W-G W-G		eP _E eS _E iL _{EZ} eM _{EZ} F	3-41-54 3-46-12 3-49-10 3-51-28 4-14	4'18"	2494	5'14"	3h36m40s
110	October 30	W-G W-G W-G W-G W-G W-G W-G		eP _E ePcP _E iS _E ePS _E eSR _{1E} iL _E eM _E F	20-55-29 20-56-51 21-02-31 21-02-41 21-06-17 21-09 21-14 22-15	7'02"	4796	8'33"	20h46m56s

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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 1932

No.	Date	Inst.	Phase	G.M.C.T.	S-P	Δ	P-0	0--Remarks
111	Nov. 12	W-G	iP _I EN	4-59-11	10'13"	8195	12'15"	4 ^h 46 ^m 56 ^s . Tentative epicenter: 41° N., 135° E. 0 by Stech- schulte's table = 4 ^h 46 ^m 51 ^s .
		W-G	eP _I EN	4-59-15				
		W-G	pP EN	5-00-31				
		W-G	ePR ₁ EN	5-02-42				
		W-G	iScPcS _{EN}	5-09-06				
		W-G	iS _I EN	5-09-24				
		W-G	eS _I EN	5-09-29				
		W-G	iSR ₁ EN	5-15-14				
		W-G	iSR ₂ EN	5-19-00				
		W-G	iSR ₃ EN	5-20-44				
		W-G	L EN	5-26				
		W-G	eM EN	5-32				
W-G	F	7-00 ±						
112	Nov. 15	W-G	eP _{EN}	10-36-07	4'42"	27°1		10 ^h 20 ^m 24 ^s .
		W-G	3 _{EN}	10-40-49				
113	Nov. 18	W-G	eP _{EN}	1-04-54		25°4		00 ^h 59 ^m 31 ^s .
		W-G	iS _{EN}	1-09-20				
		W-G	eM _{EN}	1-16-15				
		W-G	F	2-00 ±				

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 1932

No.	Date	Inst.	C/D	Phase	G.M.C.T.	S-P	Δ	P-0	0--Remarks
114	Dec. 4	W-A G-W		iP _{EZ} iS _N	4-11-53 4-13-28 6-25	6'30"	42°4	7'53"	4 ^h 04 ^m 05 ^s . 38°N.35°W.
115	Dec. 4	G-W W-A G-W G-W G-W G-W G-W		eP _Z eP' _{EZ} ePR _{1EZ} iScPcP _{EZ} iPS _{EN} i _{EN} eL _{NZ} F	8-27-29 8-30-28 8-32-21 8-33-47 8-42-48 8-44-30 9-15-30 10-49				
115	Dec. 7	G-W W-A W-A W-A G-W	C	iP _{ENZ} i _{ENZ} i _{EN} i _Z iS F	16-27-18 16-27-24 16-27-53 16-28-03 16-31-38 19-40	4'20"	24°5	5'16"	16 ^h 22 ^m 02 ^s . 18°2 N. 103°5 W.
6									
116	Dec. 19	W-A W-A W-A G-W G-W G-W	C	iP _{NZ} i _N i _N iS _{EN} i _E eL _{ENZ} F	6-34-06 6-34-20 6-34-27 6-38-45 6-40 00 6-44-00 7-40	4'39"	26°7	5'38"	6 ^h 23 ^m 28 ^s . 12°5 N. 93° W.
117	Dec. 20	W-A G-W		eP _{EN} iS _{EN} F	2-44-26 2-51-30 3-20	7'04"	47°9	8'35"	2 ^h 35 ^m 51 ^s .
	Dec. 21	Records not available for measurement.							
118	Dec. 24	G-W W-A W-A G-W G-W	C C C C	iP i _{NZ} i _N i _{NZ} eS _N	23-57-11 23-57-33 23-57-35 23-57-47 24-01-13	4'02"	22°3	4'53"	Deep focus.

Florissant Bulletin for 1932

No.	Date	Inst.	C/D	Phase	G.M.C.T.	S-P	Δ	F-O	Remarks
118 cont.	Dec. 24	G-W G-W		iS _{EN} i _E F	24-01-20 24-02-03 24-30				
119	Dec. 25	G-W G-W G-W G-W W-A W-A W-A G-W G-W G-W W-A	C D	iP _Z iPR _{1NZ} i _N i _N iScPcS _N iS _N e _N iSR _{1N} i _N i _N M _N F	2-18-20 2-22-28 2-24-26 2-28-17 2-29-08 2-30-16 2-31-32 2-37-35 2-40-36 2-45-00 3-03-00 6-40	11'54"	162°	13'56"	2 ^h 04 ^m 24 ^s . Destructive in Suchau, China.
120	Dec. 26	W-A G-W G-W G-W	C	iP eS _N iS _N iM _N F	5-07-35 5-11-32 5-11-37 5-14-14 5-50	4'02"	22°3	4'53"	Deep focus.
121	Dec. 30	W-A G-W G-W	C	iP _{NZ} eS _N eL _N F	18-53-05 18-57-38 19-03-00 19-30	4'28"	25°5	5'25"	18 ^h 47 ^m 29 ^s .
122	Dec. 31	G-W G-W G-W		eP _{EZ} i _Z eM _{EZ} F	6-50-22 6-53-40 7-36-00 9-10				

Minor Seismic movements at the following time intervals:

 10 d. 4.4 h.-5.5h.; 10d. 10.4h.-12.0h.; 24d. 6.0h.-8.9h.;
 25d. 0.2h.-1.1h.