International Seismological Centre From the ISC collection scanned by SISMOS

No. 93 *From* January 1, *to* January 31, 1923

# WASHINGTON, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\Phi = 38^\circ\ 54'\ 25''$ N $\lambda = 77^\circ\ 4'\ 24''$ W h = 42.4 m Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 11 | | $L_N$ | 4 35 44 | | | | | | Heavy micros. |
| | | F | 4 40 | | | | | | |
| Jan. 22 | | $i^P_E$ | 9 11 27 | | | | | | Heavy micros. |
| | | $e^P_N$ | 9 11 27 | | | | | | |
| | | $i^S_E$ | 9 17 12 | | | | | | |
| | | $i^S_N$ | 9 17 12 | | | | | | |
| | | $S_{R_N}$ | 9 20 53 | | | | | | |
| | | $e^L_E$ | 9 23.0 | | | | | | |
| | | $e^L_N$ | 9 22.7 | | | | | | |
| | | $M_E$ | 9 27 07 | | | 11.5 mm. | | | |
| | | $M_N$ | 9 24 40 | | 24.4 mm. | | | | |
| | | F | 12 (postea?) | | | | | | |
| Jan. 27 | | $e^P_E$? | 8 12 41 | | | | | | Heavy micros. |
| | | $e^P_N$? | 8 12 41 | | | | | | |
| | | $S_E$? | 8 14 | | | | | | |
| | | $S_N$? | 8 14 02 | | | | | | |
| | | F | 8 40 | | | | | | |

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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | 8 | 40 | | | | | |
| Feb. 2 | | $eP_E$ | 5 | 19 | 16 | | | | Microns. |
| | | $eP_N$ | 5 | 19 | 16 | | | | |
| | | $eS_E$ | 5 | 29 | | | | | |
| | | $eS_N$ | 5 | 29 | | | | | |
| | | $L_E$ | 5 | 47 | 22 | 19 | | | |
| | | $L_N$ | 5 | 49 | 22 | 22 | | | |
| | | $M_E$ | 5 | 51 | 07 | | 1.2mm. | | |
| | | F | 7 | 10 | | | | | |
| Feb. 2 | | $eP_Z$ | 5 | 19 | 23 | | | | $S_Z$ not clear. |
| | | $L_Z$ | 5 | 51 | | 21 | | | |
| | | F | 7 | 15 | | | | | |

International Seismological Centre

## REGISTRATION OF EARTHQUAKES—Continued.

| Date. | Character. | Phase. | Time. | Period. | Amplitude. $A_N$ | Amplitude. $A_E$ | Amplitude. $A_Z$ | Remarks. |
|---|---|---|---|---|---|---|---|---|
| Feb. 3 | | $eP_E$ | 16 | 13 20 | | | | |
| | | $eP_N$ | 16 | 13 21 | | | | |
| | | $iS_E$ | 16 | 22 55 | | | | |
| | | $eS_N$ | 16 | 22 55 | | | | |
| | | $eL_E$ | 16 | 31.9 | 26 | | | |
| | | $eL_N$ | 16 | 31.9 | 18 | | | |
| | | $L_E$ | 16 | 39 | 37 | | | |
| | | $L_N$ | 16 | 40 | 33 | | | |
| | | $M_{E\ 1}$ | 16 | 43 43 | 22 | | 20.8mm. | |
| | | $M_{N\ 1}$ | 16 | 48 54 | 19 | 26.6mm. | | |
| | | $M_{E\ 2}$ | 16 | 48 35 | 22 | | 31.1mm. | |
| | | $M_{E\ 3}$ | 16 | 53 38 | 19 | | 16.4mm. | |
| | | $M_{N\ 2}$ | 16 | 55 04 | 20 | 18.5mm. | | |
| | | $M_{E\ 4}$ | 16 | 56 39 | 16 | | 11.6mm. | |
| | | $M_{N\ 3}$ | 17 | 00 21 | 19 | 6.5mm. | | |
| | | $M_{E\ 5}$ | 17 | 00 09 | 15 | | 9.0mm. | |
| | | $M_{E\ 6}$ | 17 | 28 06 | 21 | | | |
| | | F | in third quake | | | | | |
| Feb. 3 | | $eP_E$ | 18 | 54 40 | | | | Sheets off at 20 hours. |
| | | $eP_N$ | 18 | 54 37 | | | | Quake still on, first and third. |
| | | $iS_E$ | 19 | 02 22 | | | | |
| | | $iS_N$ | 19 | 02 24 | | | | |
| | | $eL_E$ | 19 | 10.5 | | | | |
| | | $eL_N$ | 19 | 10.5 | | | | |

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| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 3 | | $e^{P_E}$ | 18 54 40 | | | | | | Sheets off at 20 hrs. Quakes still on, first and third. |
| | | $e^{P_N}$ | 18 54 37 | | | | | | |
| | | $i^{S_E}$ | 19 02 22 | | | | | | |
| | | $i^{S_N}$ | 19 02 24 | | | | | | |
| | | $e^{L_E}$ | 19 10.5 | | | | | | |
| | | $e^{L_N}$ | 19 10.5 | | | | | | |
| | | $L_E$ | 19 21 | 22 | | | | | |
| | | $L_N$ | 19 21 | 26 | | | | | |
| Feb. 3 | | $e^{P_E}$ | 17 51 52 | | | | | | The rest of this quake is within the cauda of first and so no more phases are discernible. |
| | | $e^{P_N}$ | 17 51 54 | | | | | | |
| | | $e^{S_E}$ | 18 02 10 | | | | | | |
| | | $e^{S_N}$ | 18 02 05 | | | | | | |
| Feb. 8 | | $i^{P_E}$ | 0 39 33 | | | | | | All phases except P doubtful. Heavy micros. |
| | | $e^{P_N}$ | 0 39 33 | | | | | | |
| | | $e^{S_E}$? | 0 44 05 | | | | | | |
| | | $e^{S_N}$? | 0 45 59 | | | | | | |
| | | $e^{L_E}$? | 0 50.0 | | | | | | |
| | | F? | 1 20 | | | | | | |
| Feb. 11 | | $e_E$ | 22 57 | | | | | | Gram difficult to read because of heavy micros. |
| | | $e_N$ | 22 56 49 | | | | | | |
| | | $e^{L_E}$ | 23 27.5 | 16 | | | | | |
| | | $e^{L_N}$ | 23 30.2 | 16 | | | | | |
| | | $L_E$ | 23 34 11 | 16 | | | | | |
| | | $L_N$ | 23 34 11 | 16 | | | | | |
| | | F | 0 (ca). | | | | | | |
| Feb. 12 | | $e^{P_E}$ | 2 10 14 | | | | | | Heavy micros. |
| | | $e^{P_N}$ | 2 10 14 | | | | | | |
| | | $e^{S_N}$? | 2 19 22 | | | | | | |
| | | $e^{L_E}$? | 2 37.3 | 21 | | | | | |
| | | $L_E$ | 2 44 11 | 16 | | | | | |
| | | $L_N$ | 2 45 26 | 16 | | | | | |
| | | F | 3 00 | | | | | | |

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No. 94 ter. *From* *to*

# WASHINGTON, D. C.

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Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Weichert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 12 | | $e_E$ | 13 47 13 | | | | | | Very heavy micros Possibly not of seismic origin. |
| | | $e_N$ | 13 47 29 | | | | | | |
| | | $e^S_E$ | 13 53 13 | | | | | | |
| | | $e^S_N$ | 13 53 13 | | | | | | |
| | | F | 14 05 | | | | | | |
| Feb. 24 | | $e^P_E$ | 7 46 12 | | | | | | Heavy micros. |
| | | $i^P_N$ | 7 46 12 | | | | | | |
| | | S | 7 55 33 | | | | | | |
| | | S | 7 55 34 | | | | | | |
| | | $e^L_E$ | 8 8.0 | | | | | | |
| | | $e^L_N$ | 8 8.0 | | | | | | |
| | | $L_E$ | 8 13 16 | 26 | | | | | |
| | | $L_N$ | 8 13 16 | 26 | | | | | |
| | | $M_{E_1}$ | 8 14 20 | 18 | | 2.2 mm. | | | |
| | | $M_{N_1}$ | 8 18 41 | 17 | 1.7 mm. | | | | |
| | | $M_{E_2}$ | 8 19 26 | 16 | | 2.4 mm. | | | |
| | | $M_{E_3}$ | 8 21 43 | 15 | | 1.7 mm. | | | |
| | | F | 9 35 | | | | | | |
| Feb. 27 | | $e^P_N$ | 20 44 22 | | | | | | P is difficult. All phases on E-W too difficult to interpret. Heavy micros. |
| | | $S_N$ | 20 49 43 | | | | | | |
| | | F | 21 10 | | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS

No. 95 *From* March 1 *to* March 31, 1923.

# WASHINGTON, D. C.

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Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Weichert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
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|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
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| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| March 1 | | $e^L_E$? | 8 51.0 | | | | | | Heavy micros. |
| | | $e^L_N$? | 8 51.0 | | | | | | Gram not well defined. |
| | | $L_E$ | 9 03 09 | 16 | | | | | |
| | | $L_N$ | 9 03 09 | 16 | | | | | |
| | | F | 9 35 | | | | | | |
| March 2 | Quake on March 2nd at about 17 hours was lost in the changing of sheets. Noticed in part. | | | | | | | | |
| March 11 | | $e_E$ | 23 26 00 | | | | | | $e_E$ might be taken for L but $e_N$ surely not. Very heavy micros. |
| | | $e_N$ | 23 26 16 | | | | | | |
| | | F | 23 50 | | | | | | |
| March 15 | | $e^P_E$ | 6 08 11 | | | | | | Very heavy micros. |
| | | $e^P_N$ | 6 08 06 | | | | | | |
| | | $S_E$? | 6 12 10 | | | | | | |
| | | $S_N$? | 6 12 14 | | | | | | |
| | | $e^L_E$ | 6 17.4 | | | | | | |
| | | $e^L_N$ | 6 16.1 | | | | | | |
| | | F | 6 50 | | | | | | |
| March 16 | | $e_E$ | 22 23 11 | | | | | | Difficult. |
| | | $e_N$ | 22 23 33 | | | | | | Very heavy micros. |
| | | L | 23 22 06 | 18 | | | | | |
| | | L | 23 30 05 | 16 | | | | | |
| | | L | 23 34 05 | 20 | | | | | |
| | | F? | In micros. | | | | | | |
| March 18 | | $e_E$ | 20 44 | | | | | | Difficult. |
| | | $e_N$ | 20 44 | | | | | | Heavy micros. |
| | | F | 20 55 | | | | | | |

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| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
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|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
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|---|---|---|---|---|
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| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| March 19 | | $e_E$ | 11 22 24 | | | | | | Heavy micros N-S poorly fined. |
| | | $S_E$? | 11 28 14 | | | | | | |
| | | $eL_E$? | 11 30.2 | | | | | | |
| | | $L_E$ | 11 31 00 | 19 | | | | | |
| | | $L_N$ | 11 31 29 | 19 | | | | | |
| | | F | 12 (ca.) | | | | | | |
| March 24 | | $e_E$ | 12 59 | | | | | | Very heavy micros. |
| | | $e_N$ | 12 59 | | | | | | |
| | | $S_E$ | 13 06 26 | | | | | | |
| | | $S_N$ | 13 06 26 | | | | | | |
| | | $eL_E$ | 13 18.4 | | | | | | |
| | | $eL_N$ | 13 18.0 | | | | | | |
| | | $L_E$ | 13 41 00 | 22 | | | | | |
| | | $L_N$ | 13 41 00 | 22 | | | | | |
| | | $M_E$ | 13 47 38 | 18 | | 1.5 mm. | | | |
| | | F | 14 45 | | | | | | |

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No. 96 *From* April 1 *to* April 30, 1923.

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| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| April 13 | | $P_E$ | 15 42 27 | | | | | | Very heavy micros. |
| | | $P_N$ | 15 42 27 | | | | | | F in micros. |
| | | $S_E$? | 15 51 52 | | | | | | |
| | | $_eL_E$ | 16 0.4 | | | | | | |
| | | $L_E$ | 16 09 | 29 | | | | | |
| | | $L_N$ | 16 09 | 18 | | | | | |
| | | $M_E$ | 16 20 | 17 | | 1.3 mm. | | | |
| | | F | 17 (ca) | | | | | | |
| April 23 | | $_eL_E$? | 4 18.7 | | | | | | Heavy micros |
| | | $L_E$ | 4 23 27 | 16 | | | | | |
| | | F | 4 40 | | | | | | |
| April 24 | | $P_E$? | 23 00 | | | | | | Heavy micro. |
| | | $P_N$? | 23 00 38 | | | | | | |
| | | $S_E$ | 23 07 05 | | | | | | |
| | | $S_N$ | 23 07 05 | | | | | | |
| | | F | 23 35 | | | | | | |
| April 25 | | $e_E$ | 19 50 | | | | | | There seems to be little doubt regarding two quakes. P of second in cauda of first. Heavy micros |
| | | $e_N$ | 19 50 | | | | | | |
| | | $S_E$? | 19 54 29 | | | | | | |
| | | $S_N$? | 19 54 29 | | | | | | |
| | | | Second quake | | | | | | |
| | | $S_E$ | 20 10 31 | | | | | | |
| | | $S_N$ | 20 10 31 | | | | | | |
| | | F | 20 50 | | | | | | |

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| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 1 | | $e_E$ | 10 54 | | | | | | H. M. |
| | | $e_N$ | 10 54 | | | | | | |
| | | $eS_E$ ? | 11 00 49 | | | | | | |
| | | $eS_N$ ? | 11 00 49 | | | | | | |
| | | F | 11 30 (ca) | | | | | | |
| May 2 | | $e_E$ | 16 41 | | | | | | |
| | | $e_N$ | 16 41 | | | | | | |
| | | $eL_E$ ? | 16 43 | | | | | | |
| | | $eL_N$ ? | 16 43 | | | | | | |
| | | $L_E$ | 16 45 | | | | | | |
| | | $L_N$ | 16 46 44 | 11 | | | | | H. M. |
| | | F | 17 20 | | | | | | |
| May 4 | | $eP_E$ | 16 36 02 | | | | | | Micros. |
| | | $eP_N$ | 16 36 03 | | | | | | |
| | | $S_E$ | 16 43 34 | | | | | | |
| | | $S_N$ | 16 43 34 | | | | | | |
| | | $eL_E$ | 16 51.4 | 7 | | | | | |
| | | $eL_N$ | 16 51.4 | 7 | | | | | |
| | | $M_E$ | 16 57 04 | | | 5.8 mm. | | | |
| | | $M_N$ | 16 57 29 | | 3.7 mm. | | | | |
| | | F | 19 (ca) | | | | | | |
| | | $e_E$ | 22 37 26 | | | | | | |
| | | $e_N$ | 22 37 36 | | | | | | |
| | | $S_E$ | 22 47 11 | | | | | | |
| | | $S_N$ | 22 47 11 | | | | | | |
| | | F | 0 20 (ca) | | | | | | |
| May 5 | | $e_N$ | 9 58 | | | | | | |
| | | F | 10 10 | | | | | | |
| | | $e_N$ | 15 18 | | | | | | V.H.M. |
| | | $eL_N$ | 15 24.4 | | | | | | E-W obscure. |
| | | $F_N$ | 16 (ca) | | | | | | |
| May 12 | | $eP_E$ | 1 39 44 | | | | | | Very heavy micros. |
| | | $iP_N$ | 1 39 44 | | | | | | |
| | | $S_E$ ? | 1 49 54 | | | | | | |
| | | $S_N$? | 1 49 54 | | | | | | |
| | | F | 3 (ca) | | | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS

 *From* *to*

# WASHINGTON, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\Phi = 38^\circ\ 54'\ 25''$ N $\lambda = 77^\circ\ 4'\ 24''$ W h = 42.4 m Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 23 | | $_eP_N$ | 22 48 47 | | | | | | Heavy micros. |
| | | $S_E$? | 22 57 04 | | | | | | P on E-W does not show No distinct M. |
| | | $S_N$? | 22 57 04 | | | | | | |
| | | $_eL_E$ | 23 7.5 | | | | | | |
| | | $L_E$ | 23 14 19 | 27 | | | | | |
| | | $L_N$ | 23 14 30 | 22 | | | | | |
| | | F | 0 54 | | | | | | |
| May 28 | | $e_E$ | 1 48 53 | | | | | | Heavy micros. |
| | | $e_N$ | 1 48 30 | | | | | | |
| | | F? | | | | | | | |
| May 30 | | $e_E$ | 16 07 24 | | | | | | Heavy micros. |
| | | $e_N$ | 16 07 20 | | | | | | |
| | | $_eL_E$? | 16 27.3 | 19 | | | | | |
| | | $L_E$ | 16 33 24 | 19 | | | | | |
| | | $L_N$ | 16 34 | | | | | | |
| | | F | 16 55 | | | | | | |
| May 31 | | $e_E$? | 22 11 38 | | | | | | Very heavy micros. |
| | | $e_N$? | 22 11 38 | | | | | | |
| | | $_eL_E$ | 22 21.6 | 21 | | | | | Difficult. |
| | | F | 22 35 | | | | | | |

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*From* June 1 *to* June 30, 1923.

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| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Weichert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch-Omori | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Mainka | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 1 | | $e_E$ | 17 40 37 | | | | | | Very heavy micros. |
| | | $e_N$ | 17 41 24 | | | | | | |
| | | $S_E$ | 17 48 58 | | | | | | |
| | | $S_N$ | 17 48 58 | | | | | | |
| | | $eL_E$ | 17 56.3 | 16 | | | | | |
| | | $eL_N$ | 17 56.3 | 16 | | | | | |
| | | $L_E$ | 18 16 47 | 19 | | | | | |
| | | $L_N$ | 18 16 31 | 14 | | | | | |
| | | $M_E$ | 18 23 | 19 | | 0.2 mm | | | |
| | | F | In 2d quake | | | | | | |
| | | $eP_E$? | 20 29 31 | | | | | | Heavy micros. |
| | | $eP_N$? | 20 29 34 | | | | | | No distinct M. |
| | | $eS_E$ | 20 39 58 | | | | | | |
| | | $iS_N$ | 20 39 58 | | | | | | |
| | | $L_E$ | 21 09 08 | 20 | | | | | |
| | | $L_N$ | 21 18 08 | | | | | | |
| | | F | 23 50 | | | | | | |
| June 6 | | $e_E$ | 18 00 | | | | | | Difficult. E-W does not show. |
| | | F | 20 | | | | | | |
| | | $e_E$ | 23 17 | | | | | | Very heavy micros. |
| | | $e_N$ | 23 17 | | | | | | e possibly sooner. |
| | | F | 23 40 | | | | | | |
| June 18 | | $eP_E$ | 8 34 12 | | | | | | Heavy micros. |
| | | $eP_N$ | 8 34 06 | | | | | | |
| | | $iS_E$ | 8 40 44 | | | | | | |
| | | $eS_N$ | 8 40 44 | | | | | | |
| | | $i_E$ | 8 41 38 | | | | | | |
| | | $i_N$ | 8 42 11 | | | | | | |
| | | $eL_E$ | 8 49.0 | 15 | | | | | |
| | | $L_N$ | 9 03 37 | 26 | | | | | |
| | | $L_E$ | 9 11 16 | 26 | | | | | |
| | | $M_E$ | 9 15 16 | 16 | | 0.3 mm | | | |
| | | F | 9 53 | | | | | | |

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| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε : 1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 19 | | $i P_E$ | 22 52 33 | | | | | | |
| | | $i P_N$ | 22 52 33 | | | | | | |
| | | $S_N$ | 22 59 40 | | | | | | |
| | | $e L_E$ | 23 6.5 | | | | | | |
| | | $e L_N$ | 23 6.5 | | | | | | |
| | | $M_{E_1}$ | 23 09 53 | 6 | | 3.5 mm. | | | $S_N$ not defined. |
| | | $M_{N_2}$ | 23 10 14 | 6 | 2.1 mm. | | | | |
| | | $N_{E_2}$ | 23 12 14 | 8 | | 2.9 mm. | | | |
| | | $M_{E_3}$ | 23 14 08 | 6 | | 1.6 mm. | | | |
| | | F | 23 55 | | | | | | |
| June 22 | | $e_E$ | 4 02 27 | | | | | | |
| | | $e L_E$? | 4 7.0 | | | | | | |
| | | $e L_N$? | 4 6.7 | | | | | | |
| | | F | 4 35 | | | | | | |
| | | $e P_N$ | 7 04 43 | | | | | | |
| | | $e S_N$ | 7 10 22 | | | | | | |
| | | $e L_N$? | 7 13.0 | | | | | | |
| | | $L_E$ | 7 43 | 32 | | | | | |
| | | $L_N$ | 7 47 30 | 27 | | | | | |
| | | F | 8 50 | | | | | | E-W does not show. |
| | | $e_N$ | 21 18 36 | | | | | | Very heavy micros. |
| | | $e L_E$?? | 21 33.3 | | | | | | |
| | | $e L_N$?? | 21 33.3 | | | | | | |

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| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Weichert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch-Omori | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Mainka | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| July 4 | | $e_N$ | 8 21 | | | | | | Difficult. |
| | | F | 8 40 | | | | | | |
| July 7 | | $e_E$ | 6 31 56 | | | | | | e possibly sooner. |
| | | $e_N$ | 6 31 56 | | | | | | Heavy micros. |
| | | $L_E$ | 6 35 29 | 11 | | | | | |
| | | F | 6 40 | | | | | | |
| July 10 | | $eP_N$ | 0 40 16 | | | | | | $P_E$ does not show. |
| | | $iS_E$ | 0 49 20 | | | | | | Very heavy micros. |
| | | $eS_N$ | 0 49 20 | | | | | | |
| | | F | ? | | | | | | |
| July 11 | | $e_N$ | 11 31 | | | | | | E-W time off. |
| | | $S_N$ | 11 38 25 | | | | | | |
| | | $eL_N$ ? | 11 52.4 | | | | | | Heavy micros. |
| | | $L_N$ | 12 15 | 27 | | | | | |
| | | $L_N$ | 12 19 | | | | | | |
| | | F | 13 10 | | | | | | |
| July 12 | | $e_N$ | 9 38 58 | | | | | | |
| | | F ? | | | | | | | |
| July 12 | | $eL_N$ | 4 5.0 | | | | | | |
| | | $L_E$ | 4 13 | 22 | | | | | Very heavy micros. |
| | | $L_N$ | 4 17 | 22 | | | | | |
| | | F | 4 37 | | | | | | |
| July 16 | | $L_N$ | 16 05 04 | 16 | | | | | Very heavy micros. |
| | | F | 16 30 | | | | | | |
| July 16 | | $e_N$ | 23 46 | | | | | | Possibly not of seismic origin. |
| | | F | 0 04 | | | | | | |
| July 17 | | $e_E$ | 1 10 49 | | | | | | Difficult. |
| | | $e_N$ | 1 27 14 | | | | | | E-W time off. |
| | | F | 1 45 | | | | | | |
| July 18 | | $e_N$ | 1 18 47 | | | | | | Very faint. |
| | | F? | | | | | | | |
| July 20 | | $e_N$ | 15 16 | | | | | | |
| | | $eS_N$? | 15 23 13 | | | | | | Very heavy micros. |
| | | F | 15 30 | | | | | | |

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| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Weichert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| July 23 | | $e^PE$? | 7 38 00 | | | | | | Very heavy micros. |
| | | $e^PN$? | 7 38 00 | | | | | | |
| | | $i^SE$ | 7 47 13 | | | | | | No other phases.in evidence. |
| | | $i^SN$ | 7 47 23 | | | | | | |
| | | F | 8 30 | | | | | | |
| July 22 | | $P_E$ | 14 29 25 | | | | | | |
| | | $P_N$ | 14 29 25 | | | | | | |
| | | $S_E$ | 14 38 35 | | | | | | |
| | | $S_N$ | 14 38 35 | | | | | | |
| | | $eL_E$ | 14 52.5 | 27 | | | | | |
| | | $eL_N$ | 14 53.2 | 26 | | | | | |
| | | $L_E$ | 15 01 43 | 16 | | | | | |
| | | $L_N$ | 15 00 29 | 16 | | | | | |
| | | $M_E$ | 15 04 05 | 16 | | 0.9 mm. | | | |
| | | F | 16 46 | | | | | | |

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| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
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| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |
| Bosch-Omori | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Mainka | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Period | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Aug. 1 | | $i_E$ | 8 38 06 | | | | | | |
| | | $i_N$ | 8 38 08 | | | | | | |
| | | F | 9 (ca.) | | | | | | |
| Aug. 8 | | $e_E$ | 12 26 21 | | | | | | Heavy micros. |
| | | $e_N$ | 12 26 21 | | | | | | |
| | | $e_N$ | 12 27 13 | | | | | | |
| | | $i_N$ | 12 35 32 | | | | | | |
| | | F | 12 45 | | | | | | |
| Aug. 8 | | $i^P_E$ | 12 07 43 | | | | | | Very heavy micros. |
| | | $i^P_N$ | 12 07 43 | | | | | | |
| | | $S_E$ | 12 12 38 | | | | | | |
| | | $S_N$ | 12 12 38 | | | | | | |
| | | $e^L_E$ | 12 14.9 | | | | | | |
| | | $e^L_N$ | 12 14.7 | | | | | | |
| | | F | In second quake. | | | | | | |
| Aug. 11 | | $e_N$? | 1 06 46 | | | | | | |
| | | $e^S_N$ | 1 17 24 | | | | | | |
| | | F | 1 50 | | | | | | |
| Aug. 11 | | $e_N$ | 1 15 35 | | | | | | Very heavy micros. |
| | | $e_N$ | 1 18 13 | | | | | | |
| | | $e^L_N$ | 1 37.6 | | | | | | E-W does not show. |
| | | F | 2 (ca.) | | | | | | |
| Aug. 28 | | $i^P_E$ | 23 21 31 | | | | | | |
| | | $e^P_N$ | 23 21 35 | | | | | | S uncertain |
| | | $e^S_E$ | 23 25 44 | | | | | | |
| | | $e^S_N$ | 23 26 00 | | | | | | |
| | | $e^L_E$ | 23 30.3 | 9 | | | | | |
| | | $e^L_N$ | 23 29.6 | 6-7 | | | | | |
| | | $M_N$ | 23 32 16 | 12 | 12.2 mm. | | | | |
| | | $M_E$ | 23 35 16 | 8 | | 13.0 mm. | | | |
| | | F | 2 (ca.) | | | | | | |

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| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
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| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch-Omori | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Mainka | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 1 | | $e^P_E$ | 3 11 33 | | | | | | |
| | | $e^P_N$ | 3 11 44 | | | | | | |
| | | $S_E$ | 3 23 00 | | | | | | |
| | | $S_N$ | 3 23 03 | | | | | | |
| | | $e^L_E$ | 3 41.9 | 43 | | | | | |
| | | $e^L_N$ | 3 41.9 | 28 | | | | | |
| | | $M_{E_1}$ | 3 57 20 | 21 | | 3.7 m.m. | | | |
| | | $M_{E_2}$ | 4 00 15 | 16 | | 5.2 m.m. | | | |
| | | $M_{E_3}$ | 4 03 03 | 16 | | 3.6 m.m. | | | |
| | | $M_{N_1}$ | 4 05 30 | 19 | 3.7 m.m. | | | | |
| | | F | 7 (ca.) | | | | | | |
| Sept. 2 | | $e^P_E$ | 3 04 25 | | | | | | |
| | | $e^P_N$ | 3 03 59 | | | | | | Very heavy micros. |
| | | $S_E$ | 3 10 58 | | | | | | |
| | | $S_N$ | 3 10 53 | | | | | | |
| | | $e^L_N$ | 3 16.7 | 17 | | | | | |
| | | $L_E$ | 3 34 02 | 25 | | | | | |
| | | $L_N$ | 3 36 03 | 25 | | | | | |
| | | $M_E$ | 3 41 47 | 22 | | 1.0 m.m. | | | |
| | | F | 4 56 | | | | | | |
| Sept. 2 | | $e_N$ | 9 51 24 | | | | | | |
| | | F | 10 04 | | | | | | |
| Sept. 2 | | $e_N$ | 22 47 31 | | | | | | Marked micros. |
| | | $iS_N$ | 22 55 08 | | | | | | E-W component not pronounced. |
| | | $e^L_E$ | 23 02 | | | | | | |
| | | $e^L_N$ | 23 02 | | | | | | |
| | | $L_N$ | 23 05 30 | 11 | | | | | |
| | | F | 23 25 | | | | | | |
| Sept. 9 | | $e_N$ | 22 22 46 | | | | | | No distinct M. |
| | | $S_E$? | 22 29 16 | | | | | | Marked micros. |
| | | $S_N$ | 22 29 16 | | | | | | |
| | | $L_E$ | 23 00 07 | 39 | | | | | |
| | | $L_N$ | 23 13 24 | 19 | | | | | |
| | | $L_E$ | 23 14 12 | 18 | | | | | |
| | | F | 24 10 | | | | | | |
| Sept. 16 | | $e^P_E$ | 16 55 56 | | | | | | Very heavy micros. |
| | | $e^P_N$ | 16 55 56 | | | | | | |
| | | F | 17 10 | | | | | | |

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# Seismological Bulletin

## of the Georgetown University Department of Geology

$\Phi = 38^\circ\ 54'\ 25''$ N  $\lambda = 77^\circ\ 4'\ 24''$ W  h = 42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Weichert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 22 | | $eL_E$? | 21 36 | | | | | | |
| | | $eL_N$? | 21 36.6 | | | | | | Very heavy micros. |
| | | $L_N$ | 21 39 11 | 32 | | | | | P and S not indicated. |
| | | $L_N$ | 21 48 | 18 | | | | | |
| | | $L_E$ | 21 50 32 | 16 | | | | | |
| | | F | 23 | | | | | | |
| Sept. 23 | | $e_N$ | 17 40 52 | | | | | | |
| | | $e_E$ | 17 41 10 | | | | | | |
| | | $eL_N$? | 17 50 | | | | | | |
| | | $L_E$ | 17 55.1 | 16 | | | | | |
| | | $L_N$ | 18 01 | 11 | | | | | |
| | | F | 18 40 | | | | | | |
| Sept. 26 | | $L_N$ | 9 20 44 | 27 | | | | | Other phases not discernible. |
| | | $L_N$ | 9 30 06 | 16 | | | | | |
| | | F | 9 50 | | | | | | Very heavy micros. |
| Sept. 30 | | $iP_E$ | 1 27 30 | | | | | | Very heavy micros. |
| | | $eP_N$ | 1 27 33 | | | | | | |
| | | $iS_E$ | 1 33 000 | | | | | | |
| | | $iS_N$ | 1 33 02 | | | | | | |
| | | $eL_E$ | 1 36.2 | 17 | | | | | |
| | | $eL_N$ | 1 36.2 | 11 | | | | | |
| | | $M_{N_1}$ | 1 38 34 | 19 | 5.7 m.m. | | | | |
| | | $M_{E_1}$ | 1 40 22 | 16 | | 7.2 m.m. | | | |
| | | $M_{E_2}$ | 1 41 26 | 16 | | 6.8 m.m. | | | |
| | | $M_{N_2}$ | 1 41 37 | 14 | 6.7 m.m. | | | | |
| | | F | 3 (ca.) | | | | | | |

Francis A. Tondorf, S. J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

*From* October 1 *to* October 31, 1923.

# WASHINGTON, D. C.

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| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch-Omori | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Mainka | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 7 | | $e^{P_E}$? | 3 46 | | | | | | $P_E$ very uncertain |
| | | $P_N$ | 3 46 | | | | | | $P_N$ more so. |
| | | | | | | | | | Very heavy micros. |
| | | $i^{S_E}$ | 3 52 37 | | | | | | No distinct M. |
| | | $i^{S_N}$ | 3 52 37 | | | | | | |
| | | $e^{L_E}$ | 3 58.4 | 18 | | | | | |
| | | $L_E$ | 4 10 10 | 22 | | | | | |
| | | $L_N$ | 4 15 | 22 | | | | | |
| | | $L_E$ | 4 28 | 45 | | | | | |
| | | $L_N$ | 4 35 14 | 23 | | | | | |
| | | F | 5 50 | | | | | | |
| Oct. 10 | | $e^{P_E}$ | 7 19 47 | | | | | | |
| | | $i^{P_N}$ | 7 19 47 | | | | | | |
| | | $S_E$ | 7 26 48 | | | | | | |
| | | $S_N$ | 7 26 48 | | | | | | |
| | | $e^{L_E}$ | 7 32.6 | 27 | | | | | |
| | | $e^{L_N}$ | 7 32.6 | 27 | | | | | |
| | | $L_E$ | 7 36 38 | 13 | | | | | |
| | | $L_N$ | 7 37 | 26 | | | | | |
| | | F | 8 56 | | | | | | |
| Oct. 13 | | $e_E$ | 4 42 | | | | | | Very difficult. e possibly sooner. |
| | | $e_N$ | 4 42 | | | | | | |
| | | $e^{L_N}$ | 4 48.8 | | | | | | Very heavy micros. |
| | | $L_E$ | 4 62 09 | 10 | | | | | |
| | | $L_N$ | 4 52 | 8 | | | | | |
| | | F | 5 10 | | | | | | |
| Oct. 28 | | $e_E$? | 5 13 | | | | | | Very heavy micros. |
| | | $e_N$? | 5 13 | | | | | | |
| | | $S_E$ | 5 17 33 | | | | | | Gram difficult |
| | | $S_N$ | 5 17 33 | | | | | | |
| | | F ? | 5 30 | | | | | | |

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| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Weichert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch-Omori | $A_N$ | 59 | 9.0 | |
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| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Nov. 1 | | $e_E$ | 20 15 24 | | | | | | |
| | | $e_N$ | 20 15 24 | | | | | | Very heavy micros. e possibly S. |
| | | $L_E$ | 20 16 29 | 9 | | | | | |
| | | $L_N$ | 20 16 29 | 9 | | | | | |
| | | e | 20 21 | | | | | | |
| | | F? | 20 40 | | | | | | |
| Nov. 2 | | $e_E$ | 21 28 56 | | | | | | |
| | | $e_N$ | 21 29 02 | | | | | | Very heavy micros |
| | | $S_N$? | 21 37 23 | | | | | | Sheet off Ohr. 20m. |
| | | $e_{LE}$ | 21 46.3 | 38 | | | | | Quake still |
| | | $e_{LN}$ | 21 46.3 | | | | | | on |
| | | $L_E$ | 22 09 10 | 30 | | | | | |
| | | $L_N$ | 22 10 02 | 26 | | | | | |
| | | $M_E$ | 22 23 05 | 19 | | 1.1mm | | | |
| Nov. 3 | | $e_P E$ | 8 42 21 | | | | | | |
| | | $i_P N$ | 8 42 21 | | | | | | |
| | | $S_E$ | 8 46 03 | | | | | | |
| | | $S_N$ | 8 46 03 | | | | | | |
| | | $e_{LE}$? | 8 47 | | | | | | |
| | | $L_N$ | 8 48 55 | 19 | | | | | |
| | | $L_E$ | 8 49 34 | 16 | | | | | |
| | | F | 10 (ca) | | | | | | |
| Nov. 3 | | $e_N$? | 16 44 | | | | | | |
| | | $e_{LE}$? | 16 18.0 | | | | | | Very heavy micros. |
| | | $e_{LN}$? | 17 17.4 | | | | | | Beginning very un- |
| | | $L_E$ | 17 18 11 | 21 | | | | | certain |
| | | $L_N$ | 17 18 16 | 26 | | | | | |
| | | $L_N$ | 17 28 | 11 | | | | | |
| | | F | 17 58 | | | | | | |
| Nov. 4 | | $e_P E$? | 0 24 22 | | | | | | |
| | | $e_P N$? | 0 24 00 | | | | | | Very heavy micros. |
| | | $e_S E$? | 0 37 00 | | | | | | Possibly sooner. |
| | | $e_S N$? | ?0 37 00 | | | | | | Difficult. |
| | | $S_{E_R}$ | 0 42 00 | | | | | | |
| | | $e_{LE}$ | 1 1.0 | | | | | | |
| | | $e_{LN}$ | 1 1.0 | | | | | | |
| | | $L_E$ | 1 03 05 | 28 | | | | | |
| | | $L_N$ | 1 03 25 | 31 | | | | | |
| | | $M_E$ | 1 07 35 | 25 | | 0,5mm. | | | |
| | | $M_N$ | 1 07 15 | 25 | 0.8mm. | | | | |
| Nov. 5 | | F | 1 55 | | | | | | |
| | | $e_E$ | 21 52 31 | | | | | | |
| | | $e_{LE}$ | 22 18.2 | | | | | | N-S bound |
| | | $L_E$ | 22 28 35 | 20 | | | | | by damper |
| | | F | 23 10 | | | | | | |
| | | $L_{EN}$ | 21 18 42 to 21 25 | | | | | | |

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| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nov. 8 | | $e^{S_E?}$ | 0 | 13 | 35 | | | | | Very heavy micros. |
| | | $i^{S_N}$ | 0 | 13 | 25 | | | | | P obscured in micros. |
| | | $e^{L_N?}$ | 0 | 19.5 | | | | | | possibly at 0 hr.07m.00s. |
| | | F | 0 | 40 | | | | | | |
| Nov. 9 | | $e_N$ | 3 | 28 | 30 | | | | | S possibly sooner. |
| | | $e^{S_N?}$ | 3 | 32 | 10 | | | | | E-W poorly defined. |
| | | $e^{L_N?}$ | 3 | 34.7 | | | | | | |
| | | $L_N$ | 3 | 39 | | | | | | |
| | | $L_E$ | 3 | 43 | | | | | | |
| | | F | 4 | 30 | et postea. | | | | | |
| Nov. 11 | | $e_E$ | 6 | 04 | | | | | | |
| | | $e_N$ | 6 | 04 | | | | | | |
| | | $S_E?$ | 6 | 11 | 48 | | | | | |
| | | $S_N?$ | 6 | 11 | 48 | | | | | |
| | | F | 6 | 20 | | | | | | |
| Nov. 11 | | $e_E$ | 14 | 06 | | | | | | |
| | | $e_N$ | 14 | 06 | | | | | | Difficult |
| | | $e_E$ | 14 | 14 | 00 | | | | | |
| | | $e_N$ | 14 | 14 | 20 | | | | | |
| | | F | 15 | (ca.) | | | | | | |
| Nov. 16 | | $e_E$ | 4 | 33 | 00 | | | | | e possibly sooner. |
| | | $e_N$ | 4 | 33 | 00 | | | | | Very heavy micros. |
| | | $S_E?$ | 4 | 36 | 24 | | | | | |
| | | $S_N?$ | 4 | 36 | 24 | | | | | |
| | | $e^{L_E?}$ | 4 | 38.0 | | | | | | |
| | | $e^{L_N?}$ | 4 | 38.0 | | | | | | |
| | | $L_E$ | 4 | 39 | | 8 | | | | |
| | | $L_N$ | 4 | 40 | 39 | 8 | | | | |
| | | F | 5 | | | | | | | |
| Nov. 16 | | $e_E$ | 7 | 28 | 25 | | | | | Very heavy micros. |
| | | $e_N$ | 7 | 28 | 25 | | | | | |
| | | $L_E$ | 7 | 31 | 35 | | | | | |
| | | $L_N$ | 7 | 32 | 23 | | | | | |
| | | F | 7 | 40 | | | | | | |
| Nov. 17 | | $e^{P_N}$ | 3 | 03 | 41 | | | | | |
| | | $S_E?$ | 3 | 12 | 57 | | | | | |
| | | $S_N?$ | 3 | 12 | 57 | | | | | |
| | | $L_E$ | 3 | 31 | 07 | 15 | | | | |
| | | $L_N$ | 3 | 36 | | | | | | |
| | | F | 4 | 10 | | | | | | |
| Nov. 18 | | $L_E$ | 9 | 16 | 39 | | | | | Very heavy micros. |
| | | $L_N$ | 9 | 17 | 32 | | | | | |
| | | F | 9 | 40 | | | | | | |

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|---|---|---|---|---|
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|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_0$ | ε : 1 |
|---|---|---|---|---|
| Bosch-Omori | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Mainka | $A_N$ | 11 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Dec. 5 | | $e_E$? | 21 06 21 | | | | | | Very heavy micros. |
| | | $e_N$? | 21 06 27 | | | | | | |
| | | $S_N$ | 21 18 08 | | | | | | |
| | | F | in micros | | | | | | |
| Dec. 13 | | $e_E$ | 17 05 17 | | | | | | Very heavy micros |
| | | $e_N$ | 17 05 17 | | | | | | |
| | | $e L_N$ | 17 10.3 | 14 | | | | | |
| | | $L_E$ | 17 19 08 | | | | | | |
| | | F | in micros | | | | | | |
| Dec. 14 | | $e_E$ | 10 44 46 | | | | | | Rest lost in heavy micros. |
| | | $e_N$ | 10 44 49 | | | | | | |
| Dec. 21 | | $e L_N$? | 8 15.3 | | | | | | Very heavy micros. |
| | | F | in micros | | | | | | |

Very heavy microseisms during the entire month made readings very difficult and uncertain.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
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| | $A_Z$ | 80 | 4.0 | |

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|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
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| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 1 | | $i_N$ | 3 10 47 | | | | | | $i_N$ is possibly $S_N$ |
| | | $e^{I_N}$? | 3 14.2 | | | | | | |
| | | F | 3 25 | | | | | | |
| Jan. 4 | | $e_E$ | 22 01 16 | 10 | | | | | E-W does not show Very heavy micros. |
| | | $e_N$ | 22 01 10 | | | | | | |
| | | $e^{L_E}$ | 22 3.3 | 10 | | | | | |
| | | $e^{L_N}$ | 22 3.4 | 10 | | | | | |
| | | $L_E$ | 22 05 06 | 10 | | | | | |
| | | $L_N$ | 22 05 26 | 10 | | | | | |
| | | F | in micros | | | | | | |
| Jan. 5 | | $e_E$ | 18 45 | | | | | | Very heavy micros. |
| | | $e_N$ | 18 45 | | | | | | |
| | | $i_E$ | 18 46 | | | | | | |
| | | $i_N$ | 18 46 | | | | | | |
| | | F | 19 (ca.) | | | | | | |
| Jan. 14 | | $e^{P_N}$? | 21 01 49 | | | | | | Very heavy micros. P possibly sooner. E-W shows no P |
| | | $i_E$ | 21 08 00 | | | | | | |
| | | $i_N$ | 21 08 00 | | | | | | |
| | | $e^{S_E}$ | 21 14 31 | | | | | | |
| | | $e^{S_N}$ | 21 14 31 | | | | | | |
| | | $L_E$ | 21 53 23 | 18 | | | | | |
| | | $L_N$ | 21 56 16 | 21 | | | | | |
| | | F | 21 30 | | | | | | |
| Jan. 21 | | $e^{P_E}$ | 2 05 24 | | | | | | Rest of phases masked in micros |
| | | $i^{P_N}$ | 2 05 24 | | | | | | |
| | | $e^{S_E}$ | 2 13 19 | | | | | | |
| | | $L_E$ | 2 31 57 | | | | | | |
| Jan. 25 | | $e_E$ | 6 12 40 | | | | | | Very Heavy micros. |
| | | $e_N$ | 6 12 40 | | | | | | |
| | | $e^{L_E}$? | 6 26.4 | | | | | | |
| | | $e^{L_N}$? | 6 26.4 | | | | | | |
| | | F | in micros | | | | | | |

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| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. 29 | | $e^{P}_{E}$ | 2 | 05 | 47 | | | | | | |
| | | $i^{P}_{N}$ | 2 | 05 | 47 | | | | | | |
| | | $e^{S}_{E}$ | 2 | 14 | 40 | | | | | | |
| | | $i^{S}_{N}$ | 2 | 14 | 43 | | | | | | |
| | | $e^{L}_{E}$ | 2 | 36.3 | | 16 | | | | | |
| | | $e^{L}_{N}$ | 2 | 36.1 | | | | | | | |
| | | F | 2 | 52 | | | | | | | |
| Jan. 30 | | $e^{P}_{E}$ | 20 | 59 | 11 | | | | | | Very heavy micros. |
| | | $i^{P}_{N}$ | 20 | 59 | 07 | | | | | | |
| | | $S_{E}$ | 21 | 04 | 57 | | | | | | |
| | | $S_{N}$ | 21 | 04 | 57 | | | | | | |
| | | $e^{L}_{E}$ | 21 | 8.2 | | 9 | | | | | |
| | | $e^{L}_{N}$ | 21 | 8.2 | | 9 | | | | | |
| | | F | 21 | 25 | | | | | | | |
| Jan. 31 | | $e_{E}$ | 1 | 16 | 37 | | | | | | Very heavy micros. |
| | | $i_{N}$ | 1 | 16 | 38 | | | | | | |
| | | F | 1 | 26 | | | | | | | P possibly at 1-08-56 |

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No. 106 From Feb. 1 to Feb. 29 19 24

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | | ~~143~~ | ~~5.0~~ | |
| | $A_E$ | | | |
| | | ~~165~~ | ~~5.0~~ | |
| | $A_Z$ | | | |
| | | ~~80~~ | ~~4.0~~ | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | | ~~133~~ | ~~5.0~~ | |
| | $A_E$ | | | |
| | | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | | ~~59~~ | ~~9.0~~ | |
| | $A_E$ | | | |
| | | ~~47~~ | ~~9.0~~ | |
| Bosch-Omori | $A_N$ | 11 | 13.5 | |
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| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 18 | | eE | 7 23 21 | | | | | | Very heavy micros. No other phases indicated. |
| | | eN | 7 22 59 | | | | | | |
| Feb. 24 | | $e^{L_E}$ | 6 6.0 | | | | | | |
| | | $e^{L_N}$ | 6 6.0 | | | | | | Very heavy micros. |
| | | $L_E$ | 6 9.0 | | | | | | |
| | | $L_N$ | 6 9.0 | | | | | | |
| | | F | 6 20 | | | | | | |

Francis A. Tondorf, S. J.,
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

No. *From* March 1 *to* March 31, *19* 24

# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| March 4 | | $e^P_E$ | 10 13 49 | | | | | | |
| | | $e^P_N$ | 10 13 51 | | | | | | |
| | | $e^S_E$ | 10 18 50 | | | | | | |
| | | $i^S_N$ | 10 18 58 | | | | | | |
| | | $e^L$ | 10 21 | 27 | | | | | |
| | | $M_{E_1}$ | 10 24 58 | 22 | | 9.2 mm. | | | |
| | | $M_{N_1}$ | 10 26 | 11 | 4.0 mm. | | | | |
| | | $M_{E_2}$ | 10 30 | 20 | 3.0 mm. | | | | |
| | | F | In second quake. | | | | | | |
| March 4 | | $e^L_E$ | 11 59.2 | | | | | | All preceding lost in changing of sheets. |
| | | $e^L_N$ | 11 59.2 | | | | | | |
| | | F | 14 (ca.) | | | | | | |
| March 4 | | $e_E$ | 17 31 | | | | | | Very heavy micros. |
| | | $e_N$ | 17 31 | | | | | | |
| | | $L_N$ | 17 34 41 | | | | | | |
| | | F | 17 50 | | | | | | |
| March 5 | | $e^L_E$? | 12 23.4 | 16 | | | | | Very heavy micros. |
| | | F? | 13 (ca.) | | | | | | |
| March 6 | | $e_N$ | 12 36 45 | | | | | | Rest doubtful. Heavy micros. |
| March 7 | | $e_N$? | 18 20 40 | | | | | | Very heavy micros. |
| | | F | in micros. | | | | | | |
| March 11 | | $e^P_N$ | 10 46 45 | | | | | | P and S uncertain. Very heavy micros. |
| | | $e^S_N$? | 10 52 23 | | | | | | |
| | | $e^L_E$? | 10 55.0 | | | | | | |
| | | $e^L_N$? | 10 55.0 | | | | | | |
| | | $L_E$ | 10 57 33 | 16 | | | | | |
| | | $L_N$ | 10 58 | 16 | | | | | |
| | | $M_E$ | 10 58 35 | | | 1.8 mm. | | | |
| | | F | 12 50 | | | | | | |
| March 13 | | $e_E$ | 11 05 | | | | | | Sheets off at 11 hrs. 31 m. Seismic indications then continuing. Very heavy micros. |
| | | $e_N$ | 11 03 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| March 15 | | $e^P_N$ | 10 44 05 | | | | | | |
| | | $e^S_N$ | 10 54 29 | | | | | | |
| | | $e^L_E$? | 11 11.6 | 16 | | | | | |
| | | $L_E$ | 11 19 28 | 16 | | | | | |
| | | F | 11 55 | | | | | | |
| March 20 | | $L_E$ | 10 13 to 10 18 | 16 | | | | | Very heavy micros. |
| March 24 | | $e^P_N$ | 20 36 | | | | | | |
| | | $S_N$? | 20 40 36 | | | | | | |
| | | $e^L_E$? | 20 43.3 | 10 | | | | | Phases very difficult. |
| | | $L_E$ | 20 45 | | | | | | Very heavy micros. |
| | | $L_N$ | 20 47 27 | 16 | | | | | |
| | | F | 21 15 | | | | | | |
| March 25 | | $e^P_E$? | 14 13 10 | | | | | | $S_N$ uncertain |
| | | $e^P_N$ | 14 13 10 | | | | | | |
| | | $S_E$? | 14 20 27 | | | | | | |
| | | $e^L_E$ | 14 23.2 | 22 | | | | | |
| | | $e^L_N$ | 14 23.2 | | | | | | |
| | | $L_E$ | 14 25 06 | 11 | | | | | |
| | | $L_N$ | 14 26 11 | 15 | | | | | |
| | | F | in following quake | | | | | | |
| March 25 | | $e^P_E$? | 15 09 27 | | | | | | Very heavy micros. |
| | | $e^P_N$ | 15 09 38 | | | | | | |
| | | $e^S_E$? | 15 17 13 | | | | | | |
| | | $e^L_E$ | 15 19.9 | 17 | | | | | |
| | | $e^L_N$ | 15 19.9 | 17 | | | | | |
| | | $L_E$ | 15 21 11 | 11 | | | | | |
| | | $L_N$ | 15 22 27 | 11 | | | | | |
| | | F | 16 (ca.) | | | | | | |
| March 30 | | $e_E$? | 0 25 | | | | | | Very heavy micros. Gram pronounced but very difficult. |
| | | $e_N$? | 0 25 | | | | | | |
| | | $S_E$? | 0 29 26 | | | | | | |
| | | $S_N$? | 0 29 22 | | | | | | |
| | | F | 1 30 | | | | | | |

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No. 108 From April 1 to April 30, 19 24

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# Seismological Bulletin

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| April 13 | | $e_E$ | 15 11 | | | | | | |
| | | $e_N$ | 15 11 | | | | | | |
| | | $L_E$ | 15 38 | | | | | | |
| | | $L_N$ | 15 40 | | | | | | |
| | | F | 15 45 | | | | | | |
| April 13 | | $e_E$ | 14 09 | | | | | | |
| | | $e_N$ | 14 10 | | | | | | Very heavy micros. |
| | | $e^{L_E}$? | 14 25.8 | | | | | | |
| | | $e^{L_N}$? | 14 25.8 | | | | | | |
| | | $L_E$ | 14 54 21 | | | | | | |
| | | $L_N$ | 14 56 34 | | | | | | |
| | | F | 15 (ca.) | | | | | | |
| April 14 | | $e^{P_E}$ | 16 39 47 | | | | | | |
| | | $e^{P_N}$ | 16 39 47 | | | | | | |
| | | $P_{N_R}$ | 16 42 03 | | | | | | |
| | | $S_E$ | 16 43 27 | | | | | | |
| | | $S_N$ | 16 43 28 | | | | | | |
| | | $e^{L_E}$? | 16 52 | | | | | | |
| | | $e^{L_N}$? | 16 52 | | | | | | |
| | | $L_E$ | 17 00 03 | 38 | | | | | |
| | | $L_N$ | 17 00 14 | 32 | | | | | |
| | | F | 20 (ca.) | | | | | | |
| April 21 | | $e^{P_E}$ | 20 07 10 | | | | | | |
| | | $e^{S_E}$ | 20 12 26 | | | | | | No record on the N-S copm. Possibly bound. through damper. Micros. |
| | | $e^{L_E}$ | 20 14.4 | | | | | | |
| | | $L_E$ | 20 19 15 | | | | | | |
| | | F | 21 10 | | | | | | |

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No. 109 *From* May 1 *to* May 31 *19* 24

# Washington, D. C.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 1 | | $_ePE$ | 20 00 10 | | | | | | No distinct $M_N$. Micros. |
| | | $_ePN$ | 20 00 14 | | | | | | |
| | | $S_E$ | 20 05 12 | | | | | | |
| | | $S_N$ | 20 05 02 | | | | | | |
| | | $_eLE$ | 20 7.4 | | | | | | |
| | | $_eLN$ | 20 7.3 | | | | | | |
| | | $M_E$ | 20 13 33 | | | 4.3 | mm. | | |
| | | F | 21 10 | | | | | | |
| May 4 | | $_eE$ | 17 10 | | | | | | No distinct M. Heavy micros. |
| | | $_eN$ | 17 10 | | | | | | |
| | | $_eLE$ | 17 22.4 | | | | | | |
| | | $_eLN$ | 17 22.4 | | | | | | |
| | | $L_E$ | 17 30 27 | 9 | | | | | |
| | | $L_N$ | 17 31 21 | 11 | | | | | |
| | | F | 17 55 | | | | | | |
| May 6 | | $L_E$ | 17 08 | | | | | | N-S does not show Heavy micros. |
| | | $L_E$ | 17 15 23 | 21 | | | | | |
| | | $L_E$ | 17 30 13 | 16 | | | | | |
| | | F | 17 50 | | | | | | |
| May 17 | | $_eE$ | 4 21 17 | | | | | | L waves of exceedingly small amplitude. N-S does not show. |
| | | $L_E$ | 4 43 28 | | | | | | |
| | | F | 4 56 | | | | | | |
| | | | | | | | | | No records on the 18th. Machines stopped to be oiled. |

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| | | V | $T_O$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_O$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_O$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 21 | | $_eP_E$ | 10 18 54 | | | | | | |
| | | $_eP_N$ | 10 18 54 | | | | | | |
| | | $_eS_E$? | 10 24 55 | | | | | | |
| | | $_eL_E$ | 10 28.4 | | | | | | |
| | | $_eL_N$ | 10 28.4 | | | | | | |
| | | F | 10 54 | | | | | | |
| May 21 | | $_eE$ | 1 45 07 | | | | | | No other phases sure. |
| | | $_eN$ | 1 44 30 | | | | | | |
| | | F | 1 55 | | | | | | |
| May 28 | | $_eP_E$ | 10 03 48 | | | | | | Heavy micros. |
| | | $_eP_N$ | 10 03 48 | | | | | | |
| | | $_iS_E$ | 10 13 36 | | | | | | No L or M apparent. |
| | | $_eS_N$ | 10 13 36 | | | | | | |
| | | $_eL_E$ | 10 26.5 | 11 | | | | | |
| | | F | 10 55 | | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS

No. 101 *From* June 1 *to* June 30, 19 24.

# Washington, D. C.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 4 | | $e_E$? | 10 21 11 | | | | | | Very heavy micros. |
| | | $e_N$? | 10 21 11 | | | | | | |
| | | $L_E$ | 10 31 47 | 11 | | | | | |
| | | $L_N$ | 10 36 11 | 11 | | | | | |
| | | F | 10 43 | | | | | | |
| June 14 | | $e_E$ | 12 31 | | | | | | N-S does not show. |
| | | F | 12 45 | | | | | | |
| June 18 | | $e_E$ | 17 46 11 | | | | | | Very faint record. |
| | | $e_N$ | 17 46 11 | | | | | | E-W very difficult. |
| | | $e^{S_N}$? | 17 47 17 | | | | | | |
| | | $e^{L_E}$? | 17 49.8 | | | | | | |
| | | F | 17 55 | | | | | | |
| June 26 | | $e^{P_E}$ | 1 56 57 | | | | | | Difficult. |
| | | $e^{P_N}$ | 1 56 57 | | | | | | |
| | | $i_E$ | 2 00 37 | | | | | | |
| | | $i_N$ | 2 00 32 | | | | | | |
| | | $S_E$? | 2 10 13 | | | | | | |
| | | $S_N$? | 2 10 10 | | | | | | |
| | | $S_{E_{R_1}}$ | 2 19 | | | | | | |
| | | $S_{N_{R_1}}$ | 2 19 | | | | | | |
| | | $L_E$ | 2 45 1 2 | 30 | | | | | |
| | | $L_N$ | 2 45 12 | 25- 26 | | | | | |
| | | $M_N$ | 2 46 35 | | 0.7mm. | | | | |
| | | $M_E$ | 2 47 1 2 | | | 1.0mm. | | | |
| | | F | 4 44 | | | | | | |
| June 30 | | $i^{P_E}$ | 15 57 01 | | | | | | |
| | | $i^{P_N}$ | 15 57 01 | | | | | | No distinct micros. |
| | | $i^{S_E}$ | 16 07 28 | | | | | | |
| | | $i^{S_N}$ | 16 07 28 | | | | | | |
| | | $e^{L_E}$ | 16 23.4 | 14 | | | | | |
| | | $L_N$ | 16 27 24 | 30 | | | | | |
| | | $L_E$ | 16 32 06 | 20 | | | | | |
| | | F | 17 29 | | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS

No. 111 *From* July 1, *to* July 31, *19* 24.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
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| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| July 1 | | $L_E$ | 3 49 35 | 20 | | | | | |
| | | $L_N$ | 3 50 01 | 11 | | | | | |
| | | F | 4 10 | | | | | | |
| July 2 | | $_ePE$ | 18 12 | | | | | | $_ePE$ possibly at 18 hr. 11 m. 42 s. |
| | | $_ePN$? | 18 12 | | | | | | |
| | | $_eSE$? | 18 17 02 | | | | | | |
| | | $_eSN$? | 18 17 02 | | | | | | |
| | | $_eLE$? | 18 22.3 | | | | | | Very difficult. |
| | | $_eLN$? | 18 21 | | | | | | |
| | | $L_E$ | 18 24 35 | 11 | | | | | |
| | | $L_N$ | 18 24 35 | 11 | | | | | |
| | | F | 18 40 | | | | | | |
| July 3 | | $_eSE$? | 5 04 52 | | | | | | |
| | | $_eSN$ | 5 04 52 | | | | | | P impossible. |
| | | $_eLE$ | 5 18.6 | 9 | | | | | |
| | | $L_E$ | 5 29 31 | 37 | | | | | |
| | | $L_N$ | 5 30 30 | 34 | | | | | |
| | | $M_E$ | 5 39 12 | 20 | | 1.0 mm. | | | |
| | | $M_N$ | 5 43 10 | 16 | 0.6 mm. | | | | |
| | | F | 6 37 | | | | | | |
| July 6 | | $L_N$ | 19-24 to 19-34 | | | | | | Very small amplitude. |
| July 6 | | $_iPN$ | 14 25 12 | | | | | | P hardly shows. |
| | | $_eSE$ | 14 30 23 | | | | | | No distinct $M_N$. |
| | | $_eSN$ | 14 30 23 | | | | | | |
| | | $_eLE$ | 14 33.7 | | | | | | |
| | | $_eLN$? | 14 33.2 | | | | | | |
| | | $L_E$ | 14 35 52 | 22 | | | | | |
| | | $L_N$ | 14 37 12 | 16 | | | | | |
| | | $M_E$ | 14 37 47 | 16 | | 0.7 mm. | | | |
| | | F | 14 56 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| July 11 | | $e_E$ | 20 05 30 | | | | | | |
| | | $e^S_E$? | 20 09 18 | | | | | | |
| | | $e^S_N$ | 20 09 18 | | | | | | |
| | | $e^L_E$? | 20 31.2 | | | | | | |
| | | $e^L_N$? | 20 31.3 | | | | | | |
| | | $L_E$ | 20 43 | 17 | | | | | |
| | | $L_N$ | 20 42 17 | 17 | | | | | |
| | | $M_E$ | 20 49 34 | 18 | | 1.0 mm. | | | |
| | | $M_N$ | 20 52 05 | 17 | 1.0 mm. | | | | |
| | | F | 22 (ca.) | | | | | | |
| July 12 | | $e^P_E$?? | 15 24 | | | | | | Micros. difficult. F-?. |
| | | $e^P_N$?? | 15 24 42 | | | | | | |
| | | $S_E$? | 15 36 44 | | | | | | |
| | | $S_N$ | 15 36 44 | | | | | | |
| July 15 | | $e^P_E$? | 0 11 53 | | | | | | N-S barely shows but for P. |
| | | $e^P_N$ | 0 11 52 | | | | | | |
| | | $S_E$ | 0 13 58 | | | | | | |
| | | $e^L_E$ | 0 14.1 | | | | | | |
| | | F | 0 18 | | | | | | |
| July 22 | | $P_N$ | 4 11 42 | | | | | | P does not show. No distinct M. |
| | | $P_{N_R}$ | 4 13 26 | | | | | | |
| | | $i^S_E$ | 4 17 34 | | | | | | |
| | | $i^S_N$ | 4 17 39 | | | | | | |
| | | $e^L_E$ | 4 20.7 | 12 | | | | | |
| | | $L_E$ | 4 22 26 | 11 | | | | | |
| | | $L_N$ | 4 25 38 | 11 | | | | | |
| | | F | 5 (ca.) | | | | | | |
| July 24 | | $e_E$ | 5 14 50 | | | | | | E-W barely shows. Heavy micros Record difficult. |
| | | $e^S_E$? | 5 24 18 | | | | | | |
| | | $L_E$ | 5 54 28 | | | | | | |
| | | F | 7 10 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| August 13 | | $e_E$ | 13 45 28 | | | | | | |
| | | $L_E$ | 14 04 24 | 13 | | | | | N-S does not show. Heavy micros. |
| | | $L_E$ | 14 15 07 | 13 | | | | | |
| | | F | 14 40 | | | | | | |
| August 14 | | $e^{P}E$? | 18 15 26 | | | | | | |
| | | $e^{S}E$ | 18 27 39 | | | | | | N-S comp. possibly bound. Very heavy micros |
| | | $S_{E_R}$ | 18 34 23 | | | | | | |
| | | $eL_E$ | 18 46.3 | 21 | | | | | |
| | | $L_E$ | 18 55 17 | 19 | | | | | |
| | | $M_E$ | 19 05 22 | 19 | | 0.4 mm. | | | |
| | | F | 22 (ca.) | | | | | | |
| August 21 | | $L_E$ | 19 29 49 to 19 40 | 18 | | | | | N-S does not show. Ampl. small. Micros. |
| August 25 | | $e^{P}E$? | 14 44 07 | | | | | | |
| | | $e^{P}N$? | 14 44 07 | | | | | | Very heavy micros. |
| | | $e^{S}E$ | 14 54 00 | | | | | | |
| | | $e^{S}N$ | 14 54 00 | | | | | | |
| | | $L_N$ | 15 21 03 | | | | | | |
| | | $L_E$ | 15 24 | | | | | | |
| | | $L_E$ | 15 28 50 | 17 | | | | | |
| | | $L_N$ | 15 28 24 | 10 | | | | | |
| | | F | in micros. | | | | | | |
| August 25 | | $e_E$? | 23 14 47 | | | | | | |
| | | $e_N$? | 23 14 47 | | | | | | Difficult. |
| | | $L_E$ | 23 50 16 | | | | | | Very heavy micros. |
| | | $L_N$ | 23 50 20 | 16 | | | | | |
| | | F? | 0 30 | | | | | | |

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| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| August 25 | | $e_E$ | 2 44 | | | | | | Other phases not clear. Very heavy micros. |
| August 26 | | $eP_E$?? | 3 26 | | | | | | Difficult |
| | | $eP_N$? | 3 25 57 | | | | | | Very heavy micros. |
| | | $eS_N$? | 3 36 24 | | | | | | |
| | | $eL_N$? | 3 43.2 | 10 | | | | | |
| | | $L_E$ | 4 03 13 | 22 | | | | | |
| | | $L_N$ | 4 04 10 | 26 | | | | | |
| | | $L_E$ | 4 12 11 | 22 | | | | | |
| | | $L_N$ | 4 13 13 | 22 | | | | | |
| | | F | 5 10 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 6 | | $e_E$ | 3 15 27 | | | | | | Very heavy micros. |
| | | $e_N$ | 3 15 05 | | | | | | |
| | | F ? | In micros | | | | | | |
| Sept. 13 | | $e^P_E$ | 14 46 48 | | | | | | $S_N$ somewhat doubtful. $S_E$ possibly sooner than $S_N$. |
| | | $e^P_N$ | 14 46 48 | | | | | | |
| | | $S_E$ | 14 57 11 | | | | | | |
| | | $S_N$ | 14 57 21 | | | | | | |
| | | $S_{R_E}$ | 15 02 32 | | | | | | |
| | | $e^L_N$ | 15 13.7 | 21 | | | | | |
| | | $L_N$ | 15 18 10 | 26 | | | | | |
| | | $L_E$ | 15 19 56 | 27 | | | | | |
| | | $M_E$ | 15 25 54 | 22 | | 0.3mm. | | | |
| | | F | 17 12 | | | | | | |
| Sept. 14 | | $L_E$ | 13 52.4 | 16 | | | | | Sheets changed. Pen down at 13hrs 34m. |
| | | $L_N$ | 13 58.9 | 16 | | | | | |
| | | $L_E$ | 14 03 54 | 19 | | | | | |
| | | $L_N$ | 14 03 42 | 19 | | | | | First part of quake lost. |
| | | F | 15(ca.) | | | | | | |
| Sept. 17 | | $P_E$ | 7 08 57 | | | | | | |
| | | $P_N$ | 7 08 57 | | | | | | |
| | | $S_E$ | 7 12 25 | | | | | | Very heavy micros. |
| | | $S_N$ | 7 12 27 | | | | | | |
| | | $e^L_E$ | 7 13.0 | 8 | | | | | |
| | | $L_E$ | 7 17 27 | 9 | | | | | |
| | | F | 7 30 | | | | | | |
| Sept. 30 | | $e^P_E$?? | 8 56 06 | | | | | | Very heavy micros. |
| | | $e^P_N$?? | 8 56 06 | | | | | | |
| | | $e^S_E$ ? | 8 57 48 | | | | | | |
| | | $e^S_N$? | 8 57 48 | | | | | | |
| | | $e_E$ ? | 8 58.2 | | | | | | |
| | | $e^L_N$? | 8 58.2 | | | | | | |
| | | $M_E$ | 8 58 22 | | | 0.89mm. | | | |
| | | $M_N$ | 8 58 24 | | 0.97mm. | | | | |
| | | F | 9 05 | | | | | | |

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| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 5 | | $e_E$ | 13 31 57 | | | | | | Sheets down at 13hrs.31m |
| | | $e_N$ | 13 31 57 | | | | | | |
| | | F | 14(ca.) | | | | | | Quake apparently before. Very heavy micros. |
| Oct. 12 | | L | 19 52 19 | 26 | | | | | Very difficu. Does not sho on N-S. |
| Oct. 13 | | $e_N$ | 12 45 02 | | | | | | Heavy micros. Very difficu. |
| | | $e^{L_E}$?? | 12 53.0 | | | | | | All phases doubtful |
| | | | | | | | | | Very heavy micros. |
| Oct. 14 | | $i^{P_E}$ | 5 06 39 | | | | | | Very heavy micros. |
| | | $e^{P_N}$ | 5 06 39 | | | | | | |
| | | $e^{S_E}$? | 5 11 58 | | | | | | |
| | | $e^{S_N}$ | 5 11 58 | | | | | | |
| | | $e^{L_N}$ | 5 14.1 | 22 | | | | | |
| | | $L_E$ | 5 15 03 | 19 | | | | | |
| | | $L_N$ | 5 19 52 | 11 | | | | | |
| | | $L_E$ | 5 20 52 | 9 | | | | | |
| | | F | 5 50 | | | | | | |
| Oct. 17 | Grams on this date could not be read because of clock difficulties. | | | | | | | | |
| Oct. 18 | | $e^{P_N}$ | 23 12 25 | | | | | | $P_E$-. ? |
| | | $e^{S_E}$ | 23 18 00 | | | | | | |
| | | $e^{S_N}$ | 23 18 00 | | | | | | Very heavy micros. |
| | | $e^{L_E}$ | 23 22.2 | 11 | | | | | |
| | | $L_E$ | 23 24 04 | 16 | | | | | |
| | | $L_N$ | 23 30 03 | 15 | | | | | |
| | | F? | 23 50 | | | | | | |
| Oct. 19 | | $e^{P_E}$? | 15 49 43 | | | | | | Very heavy micros. |
| | | $e^{P_N}$? | 15 49 43 | | | | | | |
| | | $S_E$ | 15 54 09 | | | | | | |
| | | $S_N$ | 15 54 09 | | | | | | |
| | | $e^{L_E}$ | 15 57.2 | | | | | | |
| | | $e^{L_N}$ | 15 57.2 | | | | | | |
| | | F | 16 10 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 20 | | $_e P_E$ | 20 04 06 | | | | | | |
| | | $_i P_N$ | 20 04 06 | | | | | | Very heavy micros. |
| | | $_i S_E$ | 20 13 24 | | | | | | |
| | | $_i S_N$ | 20 13 24 | | | | | | |
| | | $L_E$ | 20 31 06 | 24 | | | | | |
| | | $L_N$ | 20 36 12 | 21 | | | | | |
| | | $M_N$ | 20 36 22 | 21 | 0.5mm. | | | | |
| | | $M_E$ | 20 37 17 | 20 | | 0.5mm. | | | |
| | | F | 21 10 | | | | | | |
| Oct. 23 | | $L_E$ | 12 24 | | | | | | Simusoidal type. Period about 6-7 seconds. Very heavy micros. |
| | | $L_N$ | 12 25 | | | | | | |
| | | F | 12 30 | | | | | | |

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|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Nov. 1 | | $e^{P_E}$ | 5 01 46 | | | | | | |
| | | $i^{P_N}$ | 5 01 46 | | | | | | |
| | | $S_E$ | 5 08 30 | | | | | | S is very doubtful. |
| | | $e^{L_E}$ | 5 12.2 | | | | | | Very heavy micros. |
| | | $e^{L_N}$ | 5 12.7 | | | | | | |
| | | $L_N$ | 5 13 57 | 16 | | | | | |
| | | $L_E$ | 5 14 58 | 16 | | | | | |
| | | F | 5 30 | | | | | | |
| Nov. 28 | | $L_N$ | 12 53 44 | 9 | | | | | |
| | | $L_E$ | 13 13 27 | 22 | | | | | Very heavy micros. |
| | | $L_N$ | 13 17 21 | 16 | | | | | |
| | | F | In micros. | | | | | | |

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|---|---|---|---|---|
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|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
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|---|---|---|---|---|
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| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Dec. 17 | | $e_E$ | 6 08(ca) | | | | | | e is very uncertain |
| | | $e_N$ | 6 07(ca) | | | | | | |
| | | $L_E$ | 6 14 05 | 11 | | | | | Very singular gram. |
| | | $L_N$ | 6 14 21 | 7 | | | | | |
| | | F | 6 25 | | | | | | Difficult |
| Dec. 27 | | $i^P_E$ | 11 34 42 | | | | | | Very heavy micros. |
| | | $i^P_N$ | 11 34 42 | | | | | | |
| | | $e^S_E$ | 11 44 46 | | | | | | |
| | | $i^S_N$ | 11 44 46 | | | | | | |
| | | $S_{R_E}$ | 11 45 22 | | | | | | |
| | | $S_{R_N}$ | 11 45 22 | | | | | | |
| | | $e^L_N$ | 12 0.1 | | | | | | |
| | | F | 12 20 | | | | | | |
| Dec. 28 | | $e^P_E$ | 23 07 | | | | | | P possibly sooner. |
| | | $e^P_N$ | 23 07 | | | | | | |
| | | $i^S_E$ | 23 18 38 | | | | | | Very heavy micros. |
| | | $e^S_N$ | 23 18 38 | | | | | | |
| | | $e^L_E$ | 23 37.7 | 33 | | | | | |
| | | $L_E$ | 23 44 11 | 27 | | | | | |
| | | $L_N$ | 23 48 11 | 21-22 | | | | | |
| | | $L_N$ | 23 55 29 | 22-23 | | | | | |
| | | F | 0 30(ca) | | | | | | |

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No. 117 *From* Jan. 1, *to* Jan. 31, *19* 25

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | ~~143~~ | ~~5.0~~ | |
| | $A_E$ | ~~165~~ | ~~5.0~~ | |
| | $A_Z$ | ~~80~~ | ~~4.0~~ | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | ~~133~~ | ~~5.0~~ | |
| | $A_E$ | ~~133~~ | ~~5.0~~ | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | ~~59~~ | ~~9.0~~ | |
| | $A_E$ | ~~47~~ | ~~9.0~~ | |
| Bosch-Omori | $A_N$ | ~~14~~ | ~~13.5~~ | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 5 | | $e_N$ | 21 56 | | | | | | E-W poorly defined. |
| | | $e^L_N$ | 21 57.5 | | | | | | |
| | | $L_N$ | 21 59 17 | 8-9 | | | | | |
| | | $L_E$ | 22 00 17 | 9-10 | | | | | |
| | | F | 22 11 | | | | | | |
| 5 | | $e_E$ | 22 14 | 6 | | | | | It is possible that $e_{EN}$ |
| | | $e_N$ | 22 14 | 6 | | | | | marks $e^L_{EN}$ |
| | | F | 22 30 | | | | | | Difficult. |
| Jan. 5 | | $e^P_E$ | 13 54 34 | | | | | | Possibly $i^P_N = {}^PR_N$ |
| | | $i^P_N$ | 13 54 51 | | | | | | |
| | | $S_E$ | 14 02 18 | | | | | | |
| | | $S_N$ | 14 02 18 | | | | | | Other phases not discernible |
| | | $e^L_N$? | 14 11.7 | | | | | | |
| Jan. 18 | | $e^P_E$ | 12 18 17 | | | | | | |
| | | $e^P_N$ | 12 18 19 | | | | | | |
| | | $i^S_E$ | 12 28 27 | | | | | | |
| | | $i^S_N$ | 12 28 27 | | | | | | |
| | | $e^L_E$ | 12 40.2 | 11 | | | | | |
| | | $e^L_N$ | 12 42.2 | 11 | | | | | |
| | | $L_E$ | 12 54 30 | 23 | | | | | |
| | | $M_{E_1}$ | 12 56 18 | 22 | | 0.58mm. | | | |
| | | $M_{E_2}$ | 13 00 48 | 21 | | 1.04mm. | | | |
| | | $M_N$ | 13 02 22 | 19 | 0.72mm. | | | | |
| | | F | 15 10 | | | | | | |
| Jan. 26 | | $e^P_N$ | 19 08 38 | | | | | | |
| | | $i_E$ | 19 10 05 | | | | | | |
| | | $i_N$ | 19 10 05 | | | | | | |
| | | $S_E$ | 19 13 47 | | | | | | |
| | | $e^S_N$ | 19 13 46 | | | | | | |
| | | $e^L_E$? | 19 16.1 | | | | | | |
| | | $L_E$ | 19 19 05 | 20 | | | | | |
| | | $L_N$ | 19 19 49 | 19 | | | | | |
| | | $M_E$ | 19 21 10 | 16 | | 0.67mm. | | | |
| | | $M_N$ | 19 21 42 | 18-19 | 1.02mm. | | | | |
| | | F | 20 30 | | | | | | |

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Double

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# Washington, D. C.

## Seismological Bulletin

of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N $\lambda$=77° 4′ 24″ W h=42.4 m Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 28 | | $_ePN$? | 4 18 27 | | | | | | $P_E$ does not show. |
| | | $S_E$ | 4 28 09 | | | | | | |
| | | $S_N$ | 4 28 59 | | | | | | |
| | | $L_E$ | 4 54 | 22 | | | | | |
| | | $L_N$ | 4 54 05 | 22 | | | | | |
| | | $L_E$ | 5 02 22 | 17 | | | | | |
| | | $L_N$ | 5 05 09 | 16 | | | | | |
| | | $M_N$ | 5 07 21 | 16 | 0.40mm. | | | | |
| | | F | 6 (ca.) | | | | | | |
| Jan. 28 | | $_eL_E$ | 11 15.0 | 21 | | | | | |
| | | $_eL_N$ | 11 16.0 | 21 | | | | | P and S not ascertained. |
| | | $L_E$ | 11 16 19 | 19 | | | | | Heavy micros. |
| | | $L_N$ | 11 17 14 | 19 | | | | | |
| | | $M_E$ | 11 16 15 | 14 | | 0.31mm. | | | |
| | | $M_N$ | 11 18 00 | 11 | 0.34mm. | | | | |
| | | F | 12(ca.) | | | | | | |
| Jan. 30 | | $L_E$ | 18 05 11 | 11 | | | | | P and S cannot be recognized because of micros which are exceedingly heavy. No distinct M.F. doubtful. |
| | | $L_N$ | 18 09 31 | 19 | | | | | |
| | | $L_E$ | 18 13 03 | 19 | | | | | |
| | | F? | 18 35 | | | | | | |
| Jan. 30 | | | | | | | | | |
| Jan. 30 | | $L_E$ | 18 05 11 | 16 | | | | | P and S in micros which are very heavy E-W does not show in any phase. |
| | | $L_E$ | 18 06 32 | 19 | | | | | |
| | | F | 18 25 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 1 | | $e_E$ | 21 11 05 | | | | | | Initial wave sinusoidal. Difficult. |
| | | $e_N$ | 21 11 05 | | | | | | |
| | | $S_E$? | 21 17 21 | | | | | | |
| | | $S_N$? | 21 17 21 | | | | | | |
| | | $L_N$ | 21 27 32 | 16 | | | | | |
| | | $L_E$ | 21 30 20 | 16 | | | | | |
| | | F | 22 (ca.) | | | | | | |
| Feb. 1 | | $e_E$ | 5 37 | | | | | | |
| | | $e_N$ | 5 36 54 | | | | | | |
| | | $S_E$ | 5 47 38 | | | | | | |
| | | $S_N$ | 5 47 38 | | | | | | |
| | | $eL_E$? | 6 1.8 | | | | | | $eL$ shows a trifle early. |
| | | $eL_N$? | 6 1.5 | | | | | | |
| | | F | 6 40 | | | | | | |
| Feb. 2 | | $e_E$ | 13 52 47 | | | | | | |
| | | $e_N$ | 13 52 30 | | | | | | |
| | | $L_E$ | 14 17 44 | 22 | | | | | |
| | | $L_N$ | 14 30 | 16 | | | | | |
| | | F | 14 45 | | | | | | |
| Feb. 2 | | $e_E$ | 12 02 | | | | | | No other phases show. Heavy micros. |
| Feb. 2 | | $eP_E$ | 19 59 45 | | | | | | |
| | | $eP_N$ | 19 59 45 | | | | | | |
| | | $iS_E$ | 20 10 27 | | | | | | |
| | | $iS_N$ | 20 10 27 | | | | | | |
| | | $L_E$ | 20 35 22 | 22 | | | | | |
| | | $L_N$ | 20 35 41 | 22 | | | | | |
| | | $L_E$ | 20 46 | 17 | | | | | |
| | | $L_N$ | 20 49 | 17 | | | | | |
| | | F | 21 25 | | | | | | |
| Feb. 9 | | $eL_E$ | 15 10 08 | | | | | | |
| | | $L_N$ | 15 12 08 | 21-22 | | | | | First phases do not show. |
| | | $L_E$ | 15 13 14 | 21 | | | | | |
| | | $M_E$ | 15 15 17 | 17 | | 0.38mm. | | | |
| | | $L_E$ | 15 22 04 | 16 | | | | | |
| | | $L_E$ | 15 29 | 16 | | | | | |
| | | F | 15 50 | | | | | | |

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| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | V | $T_o$ | ε:1 |
|---|---|---|---|
| $A_N$ | | | |
| $A_E$ | | | |
| $A_Z$ | | | |

| Bosch Photographic Pendulums | V | $T_o$ | ε:1 |
|---|---|---|---|
| $A_N$ | | | |
| $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 9 | | $e_E$ | 6 00 | | | | | | Seconds of first e ambiguous because in hour mark. Slightly before 6 hrs. |
| | | $e_N$ | 6 00 | | | | | | |
| | | $e_E$ | 6 06 20 | | | | | | |
| | | $e_N$ | 6 06 20 | | | | | | |
| | | e | 18 08 14 | | | | | | |
| Feb. 16 | | $e_E$ | 18 08 14 | | | | | | e may be S. |
| | | $e_N$ | 18 08 20 | | | | | | |
| | | $e^{L_N}$ | 18 14.5 | 22 | | | | | |
| | | $L_N$ | 18 37 14 | 27 | | | | | |
| | | $L_E$ | 18 37 25 | 27 | | | | | |
| | | F | 18 52 | | | | | | |
| Feb. 20 | | $e^{P_E}$ | 1 15 08 | | | | | | No distinct M. |
| | | $e^{P_N}$ | 1 15 08 | | | | | | |
| | | $i^{S_E}$ | 1 25 30 | | | | | | |
| | | $e^{S_N}$ | 1 25 17 | | | | | | |
| | | $e^{I_E}$ | 1 41.4 | | | | | | |
| | | $L_N$ | 1 58 56 | 19 | | | | | |
| | | $L_E$ | 1 59 02 | 16 | | | | | |
| | | F | 2 10 | | | | | | |
| Feb. 24 | | $i^{P_E}$ | 0 02 20 | | | | | | |
| | | $i^{P_N}$ | 0 02 20 | | | | | | |
| | | $i^{S_E}$ | 0 09 14 | | | | | | |
| | | $i^{S_N}$ | 0 09 16 | | | | | | |
| | | $e^{L_E}$ | 0 15.4 | | | | | | |
| | | $M_E$ | 0 19 03 | | | 71.0mm | | | |
| | | $M_N$ | 0 19 11 | | 25.2 mm. | | | | |
| | | F | 1 (ca.) | | | | | | |
| Feb. 25 | | $e_E$ | 19 16 | | | | | | Very heavy micros. |
| | | $e_N$ | 19 16 | | | | | | |
| | | F | 19 20 | | | | | | |

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No. 119 *From* Mar. 1, *to* Mar. 31, 19 25

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# Seismological Bulletin

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Mar. 1 | | $_eP_E$ | 2 21 46 | | | | | | Sheet was taken off before end of quake to give data to press. |
| | | $_eP_N$ | 2 21 46 | | | | | | |
| | | $_iS_E$ | 2 23 38 | | | | | | |
| | | $_iS_N$ | 2 23 38 | | | | | | |
| | | $M_E$ | 2 24 40 | | | 128mm. | | | |
| | | $M_N$ | 2 24 56 | | 117mm. | | | | |
| | | F? | | | | | | | |
| Mar. 7 | | $e_E$ | 18 37 | | | | | | Other phases do not show. Very heavy Micros. |
| | | $e_N$ | 18 37 | | | | | | |
| Mar. 16 | | $_eL_E$ | 15 43 22 | | | | | | Very heavy micros. |
| | | $L_E$ | 15 47 | 26 | | | | | N-S hardly shows |
| | | $M_E$ | 15 50 21 | 19 | | 0.38mm. | | | |
| | | F | 16 20 | | | | | | |
| Mar. 19 | | $_eL_E$ | 16 49.4 | | | | | | Very heavy micros. N-S hardly shows. |
| | | $L_E$ | 17 07 26 | | | | | | |
| | | F | 17 15 | | | | | | |
| Mar. 21 | | $_iP_E$ | 15 25 06 | | | | | | Gram difficult. |
| | | $_eP_N$ | 15 25 00 | | | | | | Traffic interference. |
| | | $_eS_E$? | 15 28 26 | | | | | | S not very reliable. |
| | | F | 15 40 | | | | | | Very heavy micros. |
| Mar. 22 | | $e_N$ | 15 07 | | | | | | |
| | | $L_E$ | 15 12 43 | 8 | | | | | |
| | | $L_N$ | 15 12 43 | 8 | | | | | |
| | | F | 15 20 | | | | | | |
| Mar. 22 | | $L_E$ | 12 14 16 | 16 | | | | | Heavy micros. |
| | | $L_N$ | 12 15 33 | 11 | | | | | |
| | | F | Lost in changing of sheets. | | | | | | |

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*From* Mar. 1, *to* Mar. 31, *19* 25

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Mar. 22 | | $e_E$ | 9 02 | | | | | | |
| | | $e_N$ | 9 02 | | | | | | |
| | | $e^{L_E?}$ | 9 12.1 | 16 | | | | | |
| | | $L_E$ | 9 19 37 | 24 | | | | | |
| | | $M_{E_1}$ | 9 48 25 | 19 | | 0.55mm. | | | |
| | | $M_{E_2}$ | 9 50 26 | 17 | | 0.73mm. | | | |
| | | $M_{E_3}$ | 9 56 37 | 18 | | 0.80mm. | | | |
| | | F | 11 55 | | | | | | |
| Mar. 24 | | $e_E$ | 13 07 39 | | | | | | $e_E$ possibly sooner Very difficult. |
| | | $e_N$ | 13 07 39 | | | | | | |
| | | $e^{S_E?}$ | 13 12 32 | | | | | | Heavy micros. |
| | | F | 13 20 | | | | | | |
| Mar. 29 | | $e^{P_E}$ | 21 18 54 | | | | | | Heavy micros. |
| | | $i^{P_N}$ | 21 18 54 | | | | | | N-S shows no distinct M. |
| | | $i^{S_E}$ | 21 23 57 | | | | | | |
| | | $e^{S_N}$ | 21 23 57 | | | | | | |
| | | $e^{L_E}$ | 21 26 | 11 | | | | | |
| | | $M_E$ | 21 31 06 | 15-16 | | 0.96mm. | | | |
| | | F | 22 20 | | | | | | |

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No. 120 *From* April 1, *to* April 30, *19* 25

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 15.5 | |
| | $A_E$ | 11 | 15.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| April 5 | | $L_E$ | 21 59 26 | 20 | | | | | No other phases. Very heavy micros. |
| | | $L_E$ | 22 00 00 | 21 | | | | | |
| | | $L_N$ | 22 01 21 | 21 | | | | | |
| | | F? | | | | | | | |
| April 7 | | $e_E$ | 18 26 44 | | | | | | No other phases clear. Very heavy micros. |
| | | $e_N$ | 18 26 44 | | | | | | |
| April 11 | | $_iP_E$ | 11 01 37 | | | | | | |
| | | $_eP_N$ | 11 01 42 | | | | | | $_eL_{EN}$ possibly at 11h.23.8m. |
| | | R | 11 05 22 | | | | | | |
| | | $L_E$ | 11 19 40 | 11 | | | | | Heavy micros. |
| | | $L_N$ | 11 24 00 | 11 | | | | | |
| | | $L_E$ | 11 54 38 | 22 | | | | | |
| | | $L_N$ | 12 00 00 | 22 | | | | | |
| | | $M_E$ | 12 04 27 | 17 | | 0.5mm. | | | |
| | | $M_N$ | 12 05 17 | 17 | 0.4mm. | | | | |
| | | F | 14 30(ca.) | | | | | | |
| April 16 | | $_eP_E$? | 20 12 33 | | | | | | |
| | | $_eP_N$? | 20 12 33 | | | | | | |
| | | $_eS_E$? | 20 22 17 | | | | | | |
| | | $_eS_N$? | 20 22 17 | | | | | | |
| | | $L_E$ | 20 51 22 | 32 | | | | | |
| | | $L_N$ | 20 54 27 | 21 | | | | | |
| | | $M_E$ | 21 01 12 | 21 | | 1.36mm. | | | |
| | | $M_N$ | 21 04 29 | 24 | 0.4mm. | | | | |
| | | F | 22 56 | | | | | | |
| April 29 | | $e_E$ | 22 47 | | | | | | |
| | | $e_N$ | 22 47 | | | | | | |
| | | $L_E$ | 22 51 45 | 10 | | | | | |
| | | F | 23(ca.) | | | | | | |

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No. 121 *From* May 1, *to* May 31, *19* 25.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
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| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 3 | | ePE | 17 41 11 | | | | | | |
| | | ePN | 17 41 11 | | | | | | |
| | | iE | 17 43 11 | | | | | | |
| | | iN | 17 43 41 | | | | | | |
| | | iE | 17 44 37 | | | | | | |
| | | iN | 17 44 39 | | | | | | |
| | | LN | 18 07 21 | 37 | | | | | |
| | | LN | 18 15 22 | 22 | | | | | |
| | | LE | 18 22 27 | 32 | | | | | |
| | | LN | 18 22 33 | 27 | | | | | |
| | | MN | 18 36 22 | 22 | 0.4mm. | | | | |
| | | ME | 18 40 37 | 24 | | 0.4mm. | | | |
| | | F | 19 20 | | | | | | |
| May 3 | | iPE | 23 18 40 | | | | | | |
| | | iPN | 23 18 41 | | | | | | S? |
| | | eLE? | 23 40.7 | 16 | | | | | Micros. |
| | | LE | 23 43 22 | 16 | | | | | |
| | | LE | 0 09 37 | 23 | | | | | |
| | | LN | 0 17 16 | 20 | | | | | |
| | | ME | 0 21 41 | 16 | | 0.3mm. | | | |
| | | MN | 0 22 43 | 20 | 0.4mm. | | | | |
| | | F | 0 50(ca.) | | | | | | |
| May 5 | | eE | 10 28 | | | | | | |
| | | eN | 10 28 | | | | | | First phases uncertain. |
| | | eSE? | 10 37 22 | | | | | | |
| | | LE | 11 08 27 | 27 | | | | | Micros. |
| | | LN | 11 09 40 | 16 | | | | | |
| | | ME | 11 17 11 | 21 | | 0.6mm. | | | |
| | | MN | 11 25 21 | 20 | 0.7mm. | | | | |
| May 6 | | iE | 0 39 13 | | | | | | |
| | | iN | 0 39 13 | | | | | | No other phases appear. |

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# Washington, D. C.

## Seismological Bulletin

of the Georgetown University Department of Geology

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 15 | | $_ePE$ | 12 07 38 | | | | | | |
| | | $_iPN$ | 12 07 40 | | | | | | |
| | | $_iSE$ | 12 16 14 | | | | | | |
| | | $_eSN$ | 12 16 12 | | | | | | |
| | | $_iE$ | 12 16 40 | | | | | | |
| | | $_eLE$? | 12 26.1 | | | | | | |
| | | $_eLN$? | 12 26.7 | | | | | | |
| | | F? | | | | | | | S is very doubtful. |
| May 19 | | $_ePE$ | 5 43 23 | | | | | | No distinctM. |
| | | $_ePN$ | 5 43 23 | | | | | | |
| | | $_eSN$? | 5 57 41 | | | | | | |
| | | $L_E$ | 6 43 40 | 22 | | | | | |
| | | $L_N$ | 6 45 45 | 22 | | | | | |
| | | $L_N$ | 6 48 03 | 16 | | | | | |
| | | $L_E$ | 6 51 10 | 18 | | | | | |
| | | F | 7 10 | | | | | | No other phas- |
| May 20 | | $_eE$ | 23 53 21 | | | | | | es discernible. |
| | | F? | | | | | | | VeryheavyMicros. |
| | | | | | | | | | VeryheavyMicros. |
| May 26 | | $_ePE$ | 8 26 06 | | | | | | |
| | | $_ePN$ | 8 26 06 | | | | | | |
| | | $_eSE$ | 8 30 56 | | | | | | |
| | | $_eSN$ | 8 30 56 | | | | | | |
| | | $_eL$ | 8 33.7 | | | | | | |
| | | $L_N$ | 8 35 22 | 6 | | | | | |
| | | $L_E$ | 8 35 25 | 6 | | | | | |
| | | F | 9 (ca.) | | | | | | |
| May 27 | | $_eE$ | 6 14 43 | | | | | | VeryheavyM icros |
| | | $_eN$ | 6 14 43 | | | | | | |
| | | $_iE$ | 6 18 44 | | | | | | |
| | | F? | | | | | | | No other phas- |
| May 28 | | $_eN$ | 17 26 | | | | | | es.Very heavy micros. |

Francis A. Tondorf, S. J.,
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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | 143 | 5.0 | |
| | $A_Z$ | 165 | 5.0 | |
| | | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | 133 | 5.0 | |
| | | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | 59 | 9.0 | |
| Bosch-Omori | $A_N$ | 47 | 9.0 | |
| | $A_E$ | 14 | 13.5 | |
| | | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 2 | | $L_E$ | 2 02 | 6 | | | | | No other phases apparent. |
| | | $L_N$ | 2 02 | 6 | | | | | |
| | | F | 2 06 | | | | | | |
| June 3 | | $_ePE$? | 4 53 15 | | | | | | Gram difficult. |
| | | $_ePN$? | 4 53 15 | | | | | | |
| | | $S_E$? | 4 56 49 | | | | | | |
| | | $S_N$? | 4 57 00 | | | | | | |
| | | $L_E$ | 5 06 | | | | | | |
| | | $L_N$ | 5 06 40 | | | | | | |
| | | $L_N$ | 5 19 | | | | | | |
| | | F | 5 30 | | | | | | |
| June 4 | | $e_E$ | 12 10 27 | | | | | | |
| | | $S_E$ | 12 16 00 | | | | | | |
| | | $S_N$ | 12 16 00 | | | | | | |
| | | $L_N$ | 12 25 00 | 12 | | | | | |
| | | $L_E$ | 12 25 10 | 12 | | | | | |
| | | F | 12 50 | | | | | | |
| June 4 | | $L_E$ | 1 39 17 | | | | | | |
| | | F | 2 ca. | | | | | | No other phases. |
| June 7 | | $_ePE$ | 23 48 37 | | | | | | |
| | | $_iPN$ | 23 48 36 | | | | | | |
| | | $P_{R_N}$ | 23 49 11 | | | | | | |
| | | $S_E$? | 23 53 49 | | | | | | |
| | | $S_N$ | 23 53 52 | | | | | | |
| | | $_eL_E$ | 23 56.1 | | | | | | |
| | | $_iEN$ | 23 59 | | | | | | |
| | | F | 0 50 | | | | | | |
| June 9 | | $_ePE$ | 14 02 16 | | | | | | |
| | | $_ePN$ | 14 02 17 | | | | | | |
| | | $P_{R_{EN}}$ | 14 03 29 | | | | | | |
| | | $S_N$? | 14 12 24 | | | | | | |
| | | $L_E$ | 14 46 | 23 | | | | | |
| | | $L_N$ | 14 47 | 21 | | | | | |
| | | $M_N$ | 14 48 43 | 21 | 0.7mm. | | | | |
| | | $M_E$ | 14 50 47 | 21 | | 0.9mm. | | | |
| | | F | 15 47 | | | | | | |
| June 12 | | $e_E$ | 22 58 10 | | | | | | Heavy micros. |
| | | $e_N$ | 22 58 10 | | | | | | No other phas |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 14 | | $_ePN$ | 22 33 12 | | | | | | |
| | | $_iPN$ | 22 33 12 | | | | | | |
| | | $_iSE$ | 22 37 11 | | | | | | |
| | | $_eSN$ | 22 37 17 | | | | | | |
| | | $_eLE$ | 22 39.9 | | | | | | |
| | | $_eLN$ | 22 40.3 | | | | | | |
| | | $M_E$ | 22 40 59 | 12 | | 1.9mm. | | | |
| | | $M_N$ | 22 42 13 | 10 | 0.9mm. | | | | |
| | | F | 0 05 | | | | | | |
| June 18 | | $_eE$ | 21 50 | | | | | | No phases clear. e possibly sooner. |
| | | $_eN$ | 21 50 | | | | | | |
| | | F | 22 05 | | | | | | |
| June 20 | There seems to have been some seismic activity between 13 hrs. and 14 hrs. but owing to some work going on in cave this can not be evaluated. | | | | | | | | |
| June 23 | | $_iPN$ | 16 54 15 | | | | | | |
| | | $_iSE$ | 17 00 09 | | | | | | $P_E$ does not show. |
| | | $_eSN$ | 17 00 09 | | | | | | |
| | | F | In heavy micros. | | | | | | |
| June 28 | | $_iPE$ | 1 26 47 | | | | | | S on E-W not legible because of injury to gram. |
| | | $_ePN$ | 1 26 47 | | | | | | |
| | | $P_{RE}$ | 1 27 25 | | | | | | |
| | | $_iSN$ | 1 31 14 | | | | | | |
| | | $S_{RN}$ | 1 31 48 | | | | | | |
| | | $_eLE$ | 1 32 14 | | | | | | |
| | | $_eLN$ | 1 32 14 | | | | | | |
| | | $M_N$ | 1 35 04 | 8 | 123mm. | | | | |
| | | $M_e$ | 1 35 24 | 10 | | 140mm. | | | |
| | | $M_{N_2}$ | 1 36 43 | 5 | 67mm. | | | | |
| | | $M_{E_2}$ | 1 37 15 | 9 | | 75.3mm. | | | |
| | | F | In second quake. | | | | | | |
| June 28 | | $_ePE$ | 2 10 48 | | | | | | $P_N$? |
| | | $_iSE$ | 2 15 58 | | | | | | |
| | | $_eSN$ | 2 15 58 | | | | | | |
| | | $S_{RE}$ | 2 17 11 | | | | | | |
| | | $M_E$ | 2 19 36 | 6 | | 16.2mm. | | | |
| | | $M_N$ | 2 19 36 | 6 | 17.2mm. | | | | |
| | | F | 3 (ca.) | | | | | | |

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| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|
| $A_N$ | | | |
| $A_E$ | | | |
| $A_Z$ | | | |

| Bosch Photographic Pendulums | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|
| $A_N$ | | | |
| $A_E$ | | | |

| | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|
| Mainka $A_N$ | | | |
| Mainka $A_E$ | | | |
| Bosch-Omori $A_N$ | | | |
| Bosch-Omori $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 28 | | $e_E$ | 22 44 40 | | | | | | No phases clear. |
| | | $e_N$ | 22 44 40 | | | | | | |
| | | F | 23 (ca.) | | | | | | |
| June 29 | | $e^P_E$ | 14 49 12 | | | | | | |
| | | $e^P_N$ | 14 49 12 | | | | | | |
| | | $e^S_E$ | 14 54 54 | | | | | | |
| | | $e^S_N$ | 14 54 52 | | | | | | |
| | | $M_{N_1}$ | 18 00 58 | 6 | 11.8mm. | | | | |
| | | $M_{E_1}$ | 15 01 46 | 9 | | 2.4mm. | | | |
| | | $M_{N_2}$ | 15 03 22 | 10 | 4.2mm. | | | | |
| | | $M_{E_2}$ | 15 03 26 | 10 | | 3.9mm. | | | |
| | | $M_{E_3}$ | 15 05 43 | 6 | | 8.3mm. | | | |
| | | F | 17 10 | | | | | | |
| June 29 | | $e_E$ | 19 14 | | | | | | |
| | | $e_N$ | 19 13 52 | | | | | | No other phases apparent. |
| | | F | 19 30. | | | | | | |
| June 30 | | $e_N$ | 9 36 44 | | | | | | Difficult. |
| | | F | 9 45. | | | | | | |
| June 30 | | $e_N$ | 6 41 34 | | | | | | E-W shows nothing. |
| | | F | 6 51 | | | | | | |

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NO. 123 FROM July 1 to July 31, 1925.

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| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Wiechert Horizontal(200kg. Vertical(80kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| DATE | CHARACTER | PHASE | TIME | PERIODS | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | $\Delta$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| July 3 | | $e_E$ | 16 51 36 | | | | | | |
| | | $e_N$ | 16 51 36 | | | | | | $e_{EN}$ possibly is $P_{REN}$ |
| | | $e^S_E$? | 16 55 25 | | | | | | |
| | | $e^S_N$? | 16 55 34 | | | | | | Difficult |
| | | F | 17 10 | | | | | | |
| July 3 | | $e_E$ | 18 34 26 | | | | | | |
| | | $e_N$ | 18 34 22 | | | | | | |
| | | $e_N$ | 18 38- | | | | | | |
| | | $L_E$ | 18 42 | 8 | | | | | |
| | | $L_N$ | 18 42 | 9-10 | | | | | |
| | | F | 19 (ca.) | | | | | | |
| July 4 | | $L_E$ | 10 14 18 | 21 | | | | | Heavy micros. |
| | | $L_N$ | 10 17 19 | 20 | | | | | |
| | | F | 11 (ca.) | | | | | | |
| July 6 | | $e^P_E$ | 12 27 32 | | | | | | |
| | | $e^P_N$? | 12 27 29 | | | | | | Heavy micros. |
| | | $e^S_E$?? | 12 36 10 | | | | | | |
| | | $e^S_N$? | 12 36 44 | | | | | | |
| | | $e^L_E$ | 12 38 09 | | | | | | |
| | | F? | | | | | | | |
| July 6 | | $e_E$ | 21 36 00 | | | | | | |
| | | $e_N$ | 21 36 00 | | | | | | |
| | | F | 21 40 | | | | | | |
| July 7 | | $e^P_E$? | 15 10 49 | | | | | | |
| | | $e^P_N$ | 15 10 49 | | | | | | |
| | | $e^S_E$? | 15 15 27 | | | | | | |
| | | $e^S_N$? | 15 15 27 | | | | | | |
| | | $e^L_E$ | 15 17.0 | | | | | | |
| | | $e^L_N$ | 15 17.0 | | | | | | |
| | | $L_E$ | 15 19 32 | 11 | | | | | |
| | | $L_N$ | 15 20 33 | 16 | | | | | |
| | | F | 17 30 | | | | | | |

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| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Wiechert Horizontal(200kg.) Vertical(80kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Bosch-Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| DATE | CHARACTER | PHASE | TIME | PERIODS | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | $\Delta$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| July 7 | | $e^PE$ | 14 18 54 | | | | | | |
| | | $e^PN$ | 14 18 54 | | | | | | S possibly is read 4-5 seconds too soon. |
| | | $e^SE$ | 14 24 16 | | | | | | |
| | | $e^SN$ | 14 24 16 | | | | | | |
| | | $e^LN$ | 14 27 11 | | | | | | |
| | | $L_E$ | 14 30 33 | 16 | | | | | |
| | | $L_N$ | 14 30 41 | 16 | | | | | |
| | | $M_N$ | 14 31 32 | 14 | 3.0mm | | | | |
| | | $M_E$ | 14 31 38 | 9 | | 1.2mm. | | | |
| | | F | In second quake. | | | | | | |
| July 7 | | $e^PE$ | 17 49 09 | | | | | | |
| | | $e^PN$ | 17 49 10 | | | | | | |
| | | $i^SE$ | 17 53 45 | | | | | | |
| | | $i^SN$ | 17 53 45 | | | | | | |
| | | $e^LE$ | 17 55 48 | | | | | | |
| | | $e^LN$ | 17 55 48 | | | | | | |
| | | $L_E$ | 17 57 27 | 16 | | | | | |
| | | $L_N$ | 17 57 54 | 16 | | | | | |
| | | $M_E$ | 18 04 06 | 11 | | 0.6mm. | | | |
| | | F | 19 30 | | | | | | |
| July 8 | | $e_E$ | 14 44 | | | | | | |
| | | $e_N$ | 14 44 | | | | | | e possibly sooner. Very heavy micros. |
| | | $e^SN$? | 14 48 35 | | | | | | |
| | | F | Doubtful | | | | | | |
| July 10 | | $e_E$ | 14 55 09 | | | | | | |
| | | $e_N$ | 14 55 20 | | | | | | |
| | | F | 15 | | | | | | |

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| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Wiechert Horizontal (200kg.) Vertical (80kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | :1 |
|---|---|---|---|---|
| Bosch-Omori - Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| DATE | CHARACTER | PHASE | TIME | PERIODS | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | $\Delta$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| July 17 | | $e_E$ | 21 21 19 | | | | | | No other phases. |
| | | $e_N$ | 21 21 20 | | | | | | F in heavy micros. |
| | | $e_E$ | 21 30 29 | | | | | | |
| | | $e_N$ | 21 30 29 | | | | | | |
| | | F? | | | | | | | |
| July 27 | | $e_E$ | 12 25 | | | | | | |
| | | $e_N$ | 12 25 | | | | | | |
| | | F | 12 30 | | | | | | |
| July 30 | | $e_E$ | 12 24 19 | | | | | | |
| | | $e_N$ | 12 24 20 | | | | | | $e_{EN}$ may be sooner. |
| | | $S_E$ | 12 26 27 | | | | | | |
| | | $S_N$ | 12 26 27 | | | | | | |
| | | F | 12 50 | | | | | | |
| July 31 | | $e_E$ | 9 02 11 | | | | | | |
| | | $e^L_E$ | 9 05 27 | | | | | | N-S does not show. Heavy micros. |
| | | $L_E$ | 9 09 13 | 18 | | | | | |
| | | F | 9 30 | | | | | | |

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Director.

International Seismological Centre From the ISC collection scanned by SISMOS

No. 124 From August 1, to August 31, 19 25

# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | 143 | 5.0 | |
| | $A_Z$ | 165 | 5.0 | |
| | | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | 133 | 5.0 | |
| | | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | 59 | 9.0 | |
| Bosch-Omori | $A_N$ | 47 | 9.0 | |
| | $A_E$ | ~~14~~ | ~~13.5~~ | |
| | | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Aug. 7 | | e$P_E$ | 7 54 17 | | | | | | |
| | | e$P_N$ | 7 54 11 | | | | | | |
| | | $P_{E_1}$ | 7 54 52 | | | | | | |
| | | $S_E$ | 7 59 17 | | | | | | |
| | | e$S_N$? | 7 59 22 | | | | | | |
| | | e$L_E$ | 8 00 46 | | | | | | |
| | | e$L_N$? | 8 01 01 | | | | | | |
| | | $M_N$ | 8 08 10 | 6 | 0.4mm. | | | | |
| | | $M_E$ | 8 08 48 | 8-9 | | 0.3mm. | | | |
| | | F | 10 (ca.) | | | | | | |
| Aug. 9 | | e$_E$ | 11 33 28 | | | | | | Difficult. HeavyMicros. |
| | | e$_N$ | 11 33 28 | | | | | | |
| | | $L_E$ | 11 51 34 | | | | | | |
| | | F? | | | | | | | |
| Aug. 11 | | e$_E$ | 20 02 35 | | | | | | Sinuscidal waves. Difficult. |
| | | F? | | | | | | | |
| Aug. 12 | | $P_E$ | 7 04 58 | | | | | | N-S does not show. HeavyMicros. |
| | | $S_E$ | 7 10 08 | | | | | | |
| | | e$L_E$ | 7 14.9 | 16 | | | | | |
| | | $L_E$ | 7 18 03 | 16 | | | | | |
| | | F | 7 35 | | | | | | |
| Aug. 13 | | e$_E$ | 3 01 19 | | | | | | No other phases. |
| | | e$_N$ | 3 01 19 | | | | | | |
| | | F? | | | | | | | |
| Aug. 14 | | e$_E$ | 4 28 21 | | | | | | |
| | | e$_N$ | 4 28 15 | | | | | | |
| | | F? | | | | | | | No other phases. |
| Aug. 19 | | e$_E$ | 5 44 45 | | | | | | No other phases. |
| | | F | 5 52 | | | | | | N-S does not show. |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Aug. 19 | | $e^{P_E}$ | 12 18 48 | | | | | | |
| | | $i^{P_N}$ | 12 18 49 | | | | | | |
| | | $i^{S_E}$ | 12 28 04 | | | | | | |
| | | $e^{S_N}$? | 12 28 05 | | | | | | |
| | | $S_{R_{E_2}}$ | 12 36 20 | | | | | | |
| | | $S_{R_{N_2}}$ | 12 36 30 | | | | | | |
| | | $e^{L_E}$ | 12 41 | | | | | | |
| | | $e^{L_N}$ | 12 41 | | | | | | |
| | | $L_E$ | 12 43 16 | 16 | | | | | |
| | | $L_N$ | 12 43 16 | 16 | | | | | |
| | | $M_E$ | 12 45 47 | 21 | | 1.4mm. | | | |
| | | $M_N$ | 12 48 07 | 17 | 0.7mm. | | | | |
| | | F | 14 20 | | | | | | |
| Aug. 29 | | $e^{P_E}$ | 22 43 15 | | | | | | $S_{EN}$ does show. Heavy Micros |
| | | $e^{P_N}$ | 22 43 15 | | | | | | |
| | | $e^{L_E}$ | 22 52 55 | 6 | | | | | |
| | | $e^{L_E}$ | 22 52 55 | 6 | | | | | |
| | | $M_E$ | 22 53 38 | 6 | | 1.1mm. | | | |
| | | $M_N$ | 22 53 38 | 6 | 2.0mm. | | | | |
| | | F | 24 (ca.) | | | | | | |

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No. 125 From September 1, to September 30, 19 25.

# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 4 | | $_e P_E$ | 10 41 50 | | | | | | |
| | | $_i P_N$ | 10 41 50 | | | | | | |
| | | $_e S_N$ | 10 47 17 | | | | | | |
| | | $S_{R_E}$? | 10 48 17 | | | | | | $S_E$ does not show. |
| | | $_e L_N$? | 10 57 | | | | | | |
| | | F? | | | | | | | Difficult. |
| Sept. 5 | | $_e P_E$ | 16 41 33 | | | | | | |
| | | $_e P_N$ | 16 41 35 | | | | | | |
| | | $_e S_E$ | 16 50 44 | | | | | | |
| | | $_e S_N$ | 16 50 44 | | | | | | |
| | | $L_E$ | 17 04 05 | 11 | | | | | |
| | | $L_N$ | 17 08 | 11 | | | | | |
| | | F | 18 (ca.) | | | | | | |
| Sept. 12 | | $L_E$ | 9 41 40 | | | | | | |
| | | F? | | | | | | | |
| Sept. 29 | | $P_E$ | 17 39 00 | | | | | | |
| | | $P_N$ | 17 39 00 | | | | | | $P_{E_N}$ possibly sooner. |
| | | $_i S_E$ | 17 43 19 | | | | | | |
| | | $_e S_N$ | 17 43 15 | | | | | | |
| | | $_e L_E$ | 17 45.0 | | | | | | |
| | | $_e L_N$ | 17 45.0 | | | | | | |
| | | $L_E$ | 17 48 04 | 17 | | | | | |
| | | $L_N$ | 17 48 04 | 17 | | | | | |
| | | F | 18 30. | | | | | | |

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# Washington, D. C.

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Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 5 | | $i^{P_E}$ | 4 14 51 | | | | | | Long waves do not show clearly. |
| | | $i^{P_N}$ | 4 14 51 | | | | | | |
| | | $i_E$ | 4 16 00 | | | | | | $i_{EN}$ may be $P_E$ of another quake. Some overlapping apparent |
| | | $i_N$ | 4 16 00 | | | | | | |
| | | $i^{S_E}$ | 4 19 21 | | | | | | No distinct M |
| | | $i^{S_N}$ | 4 19 25 | | | | | | |
| | | $e^{L_E}$ | 4 20 22 | | | | | | |
| | | $e^{L_N}$ | 4 20 22 | | | | | | |
| | | F | 5 30 | | | | | | |
| Oct. 13 | | $i^{P_E}$ | 17 47 31 | | | | | | |
| | | $i^{P_N}$ | 17 47 30 | | | | | | |
| | | $P_{R_E}$ | 17 49 00 | | | | | | |
| | | $P_{R_N}$ | 17 49 00 | | | | | | |
| | | $i^{S_E}$ | 17 53 49 | | | | | | |
| | | $i^{S_N}$ | 17 53 54 | | | | | | |
| | | $e^{L_E}$ | 17 57.0 | 8 | | | | | |
| | | $e^{L_N}$ | 17 57 13 | 7 | | | | | |
| | | $L_E$ | 17 59 00 | 21 | | | | | |
| | | $L_N$ | 17 59 10 | 21 | | | | | |
| | | $M_E$ | 17 59 58 | 21 | | | 2.75mm. | | |
| | | F | 19 45 | | | | | | |
| Oct. 15 | | $e_E$ | 13 00 | | | | | | Difficult. Sheets put on at precisely 13hrs. No other phases. |
| | | $e_N$ | 13 00 | | | | | | |
| | | F | ? | | | | | | |
| Oct. 19 | | $e_E$ | 11 00 | | | | | | |
| | | $e_N$ | 11 00 | | | | | | |
| | | $L_N$ | 11 02 02 | | | | | | |
| | | $L_E$ | 11 02 34 | | | | | | |
| | | F | 11 30 | | | | | | |
| Oct. 21 | | $i_E$ | 17 44 16 | | | | | | |
| | | $e^{L_E}$ | 17 52 | 8-9 | | | | | N-S difficult. |
| | | $L_E$ | 17 57 26 | 9 | | | | | Heavy micros. |

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| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 22 | | $e_N$ | 17 21 23 | | | | | | Difficult. |
| | | $e_E$ | 17 21 27 | | | | | | N-S hardly shows. |
| | | $L_E$ | 18 15 | 27 | | | | | |
| | | $L_E$ | 18 34 17 | 31 | | | | | |
| | | F | 19 (ca.) | | | | | | |
| Oct. 30 | | $e_E$ | 15 16 | | | | | | No other phases. Very heavy micros. |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | 143 | 5.0 | |
| | $A_Z$ | 165 | 5.0 | |
| | | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | 133 | 5.0 | |
| | | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | 59 | 9.0 | |
| Bosch-Omori | $A_N$ | 47 | 9.0 | |
| | $A_E$ | 14 | 13.5 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | 11 Δ 13.7 | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Nov. 1 | | $e_E$ | 15 23 55 | | | | | | Very heavy micros. No other phases. |
| | | $e_N$ | 15 24 27 | | | | | | |
| | | $i_E$ | 15 28 27 | | | | | | |
| | | F? | | | | | | | |
| Nov. 6 | | $e_E$ | 14 14 27 | | | | | | |
| | | $e_N$ | 14 14 29 | | | | | | |
| | | $L_E$? | 14 32 | 7 | | | | | |
| | | F | 14 40 | | | | | | |
| Nov. 9 | | $e_N$ | 20 10 | | | | | | Very heavy micros. $e_{EN}$ may be sooner. Very difficult. |
| | | $e_N$ | 20 10 | | | | | | |
| | | $e^{L_E}$? | 20 13 49 | | | | | | |
| | | $e^{L_N}$? | 20 13 49 | | | | | | |
| | | F? | 20 25 | | | | | | |
| Nov. 13 | | $e^{P_E}$ | 12 35(ca.) | | | | | | P is read approximately because badly masked in micros. |
| | | $e^{P_N}$ | 12 35(ca.) | | | | | | |
| | | $e^{S_E}$ | 12 45 51 | | | | | | |
| | | $i^{S_N}$ | 12 45 51 | | | | | | |
| | | $L_E$ | 13 24 26 | 26 | | | | | |
| | | $L_N$ | 13 29 27 | 26 | | | | | |
| | | $M_E$ | 13 34 26 | 18 | | 0.8mm. | | | |
| | | F | 14 50 | | | | | | |
| Nov. 14 | | $e^{P_E}$? | 14 13 16 | | | | | | First phases difficult. |
| | | $e^{P_N}$? | 14 13 09 | | | | | | Very heavy micros. |
| | | $P^{R_{N_1}}$ | 14 13 34 | | | | | | |
| | | $S_E$ | 14 23 45 | | | | | | |
| | | $S_N$ | 14 23 45 | | | | | | |
| | | $e^{L_E}$ | 14 45.7 | 21 | | | | | |
| | | $L_E$ | 14 49 39 | 32 | | | | | |
| | | $L_N$ | 14 50 51 | 43 | | | | | |
| | | $M_N$ | 15 04 58 | 22 | .9mm. | | | | |
| | | $M_{E_1}$ | 15 05 10 | 22 | | 1.7mm. | | | |
| | | $M_{E_2}$ | 15 25 06 | 19 | 0.7mm. | | | | |
| | | F | 16 45 | | | | | | |

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| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | V | $T_o$ | ε:1 |
|---|---|---|---|
| $A_N$ | | | |
| $A_E$ | | | |
| $A_Z$ | | | |

| Bosch Photographic Pendulums | V | $T_o$ | ε:1 |
|---|---|---|---|
| $A_N$ | | | |
| $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Nov. 16 | | $i P_E$ | 12 01 29 | | | | | | |
| | | $e P_N$ | 12 01 34 | | | | | | |
| | | $P R_{E_2}$ | 12 02 47 | | | | | | |
| | | $i S_E$ | 12 06 51 | | | | | | |
| | | $i S_N$ | 12 06 51 | | | | | | |
| | | $i_E$ | 12 12 05 | | | | | | |
| | | $i_N$ | 12 12 06 | | | | | | |
| | | $M_{N_1}$ | 12 13 34 | 7 | 4.4mm. | | | | |
| | | $M_{E_1}$ | 12 13 38 | 7 | | 2.7mm. | | | |
| | | $M_{N_2}$ | 12 15 03 | 7 | 4.1mm. | | | | |
| | | $M_{E_2}$ | 12 16 23 | 12 | | 2.6mm. | | | |
| | | $M_{N_3}$ | 12 17 38 | 9 | 2.6mm | | | | |
| | | F | 13 50(ca.) | | | | | | |
| Nov. 17 | | $i P_N$ | 0 26 41 | | | | | | E-W so marked. in micros impossible to read. Very heavy micros. |
| | | $e S_N$ | 0 34 24 | | | | | | |
| | | $L_N$ | 0 57 | 7 | | | | | |
| | | F? | | | | | | | |
| Nov. 28 | | $L_E$ | 17 17 05 | 22 | | | | | No other phases. |
| | | $L_E$ | 17 24 05 | 16 | | | | | |
| | | F | 18 30 | | | | | | |
| Nov. 28 | | $i P_E$ | 12 39 55 | | | | | | Very heavy |
| | | $i P_N$ | 12 39 55 | | | | | | P may be $P R_1$ |
| | | $i S_E$ | 12 43 23 | | | | | | |
| | | $e S_E$? | 12 46.2 | | | | | | |
| | | L | 12 50 45 | | | | | | |
| | | F | 13 15 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Dec. 6 | | eE | 16 28(ca.) | | | | | | Very heavy micros. Difficult. |
| | | eN | 16 28(ca.) | | | | | | |
| | | $iS_E$? | 16 29 36 | | | | | | |
| | | $iS_N$? | 16 29 36 | | | | | | |
| | | $S_{RN_1}$ | 16 30 19 | | | | | | |
| | | $eL_E$? | 16 30.5 | | | | | | |
| | | F | 17 (ca.) | | | | | | |
| Dec. 7 | | $L_E$ | 9 23 | | | | | | No other phases. |
| | | F? | | | | | | | |
| Dec. 9 | | $L_E$ | 11 53 to 12 30 | | | | | | A series of long waves with periods approximating 6 seconds. |
| Dec. 10 | | $eP_E$ | 14 20 41 | | | | | | |
| | | $eP_N$ | 14 20 41 | | | | | | |
| | | $iS_E$ | 14 25 43 | | | | | | |
| | | $iS_N$ | 14 25 41 | | | | | | |
| | | $S_{RE_1}$ | 14 26 18 | | | | | | |
| | | $S_{RN_1}$ | 14 26 18 | | | | | | |
| | | $eL_N$ | 14 27.3 | 15 | | | | | |
| | | $M_{E_1}$ | 14 31 51 | 18 | | 4.3mm. | | | |
| | | $M_{E_2}$ | 14 33 03 | 18 | | 6.1mm. | | | |
| | | $M_{N_1}$ | 14 33 35 | 17 | 4.7mm. | | | | |
| | | $M_{N_2}$ | 14 34 27 | 14 | 3.9mm. | | | | |
| | | $M_{E_3}$ | 14 35 55 | 16 | | 3.2mm. | | | |
| | | F | 17 (ca.) | | | | | | |
| Dec. 11 | | eE | 1 40 04 | | | | | | Very heavy micros. |
| | | eN | 1 42 32 | | | | | | |
| | | $eL_E$ | 1 45.4 | 10 | | | | | |
| | | $eL_N$ | 1 45.4 | 10 | | | | | |
| | | $L_N$ | 1 46 30 | 10 | | | | | |
| | | $L_E$ | 1 47 06 | 10 | | | | | |
| | | F | 2 30 | | | | | | |

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# Washington, D. C.

## Seismological Bulletin

### of the Georgetown University Department of Geology

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Dec. 19 | | $_ePE$ | 16 21 29 | | | | | | |
| | | $_iPN$ | 16 21 32 | | | | | | |
| | | $_iSE$ | 16 31 20 | | | | | | |
| | | $_eSN$ | 16 31 23 | | | | | | |
| | | $_eLE$ | 16 44.0 | 20 | | | | | |
| | | $L_E$ | 16 49 40 | 21 | | | | | |
| | | $L_N$ | 16 51 | 28 | | | | | |
| | | F | 17 (ca.) | | | | | | |
| Dec. 22 | | $L_E$ | 6 11 | 26 | | | | | |
| | | $L_E$ | 6 14 | 27 | | | | | N-S does not show. |
| | | F | 6 27 | | | | | | |
| Dec. 23 | | $e_E$ | 11 16 | | | | | | Very heavy micros. |
| | | $e_N$ | 11 16 | | | | | | $e_{EN}$ possibly read too soon or too late. |
| | | $iS_N$? | 11 25 31 | | | | | | $S_{EN}$ may be some other phasedepending on interpretation of $e_{EN}$ |
| | | F? | | | | | | | No other phases show. |
| Dec. 27 | | $L_E$ | 11 31 to 11 45 | 6 | | | | | No other phases Heavy micros. |
| Dec. 27 | | $e_N$ | 17 53 34 | | | | | | Very heavy micros |
| | | $e_E$ | 17 56 39 | | | | | | |
| | | $L_E$ | 18 08 | | | | | | |
| | | $L_N$ | 18 08 | | | | | | |
| | | F? | | | | | | | |
| Dec. 29 | | $e_N$ | 16 39 | | | | | | |
| | | $e_E$ | 16 44 17 | | | | | | |
| | | $e_N$ | 17 40 | | | | | | |
| | | F? | | | | | | | Very heavy micros |

Francis A. Tondorf, S. J.,
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

No. 129 *From* Jan. 1 *to* Jan. 31, 1926.

# Washington, D. C.

# Seismological Bulletin

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 1 | | $e^{P}E$ | 21 47 40 | | | | | | Very small amplitude throughout. |
| | | $e^{P}N$ | 21 47 40 | | | | | | |
| | | $i^{S}E$ | 21 56 00 | | | | | | |
| | | $e^{S}N$ | 21 56 00 | | | | | | |
| | | $e^{L}E$ | 22 7.7 | | | | | | |
| | | F | Doubtful. | | | | | | Heavy micros. |
| Jan. 7 | | $e_E$? | 14 37 38 | | | | | | N-S does not show. |
| | | $e^{L}E$? | 14 42 40 | | | | | | |
| | | $L_E$ | 14 46 | 22 | | | | | |
| | | F | 15 (ca.) | | | | | | |
| Jan 25. | | $e^{P}E$? | 0 57 02 | | | | | | |
| | | $e^{P}N$? | 0 57 02 | | | | | | |
| | | $i_E$ | 0 59 57 | | | | | | |
| | | $e^{L}E$ | 1 26.0 | 11 | | | | | |
| | | $e^{L}N$ | 1 25.4 | 11 | | | | | |
| | | $L_N$ | 1 30 00 | 19 | | | | | |
| | | $L_E$ | 1 37 57 | 27 | | | | | |
| | | $M_{E_1}$ | 1 40 05 | 23 | | 2.2mm | | | |
| | | $M_{E_2}$ | 1 43 55 | 17 | | 1.6mm | | | |
| | | $M_N$ | 1 53 18 | 17 | 0.7mm. | | | | |
| | | F | 3 30 | | | | | | |
| Jan. 26 | | $L_E$ | 8 09 08 | 22 | | | | | |
| | | $M_E$ | 8 18 13 | | | 0.2mm | | | N-S does not show. |
| | | F | 9 15 | | | | | | Heavy micros. |

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# Washington, D. C.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 1 | | $i_E$ | 1 32 37 | | | | | | |
| | | $i_E$ | 1 34 28 | | | | | | |
| | | $L_E$? | 1 40 17 | | | | | | |
| | | F? | | | | | | | |
| Feb. 8 | | $ePE$ | 15 23 44 | | | | | | $P_{EN}$ time very doubtful Micros. |
| | | $ePN$ | 15 23 44 | | | | | | |
| | | $iS_E$ | 15 28 52 | | | | | | |
| | | $iS_N$ | 15 28 52 | | | | | | |
| | | $S_{R_{E_1}}$ | 15 30 40 | | | | | | |
| | | $eL_E$ | 15 31.9 | 20 | | | | | |
| | | $eL_N$ | 15 31.9 | 26 | | | | | |
| | | $M_{N_1}$ | 15 33 10 | 29 | 1.5mm. | | | | |
| | | $M_{E_1}$ | 15 35 01 | 15 | | 4.7mm. | | | |
| | | $M_{N_2}$ | 15 35 10 | 14 | 2.0mm. | | | | |
| | | $M_{E_2}$ | 15 35 45 | 12 | | 6.7mm. | | | |
| | | $M_{E_3}$ | 15 39 43 | 12 | | 3.6mm. | | | |
| | | $M_{E_4}$ | 15 43 11 | 14 | | 3.3mm. | | | |
| | | F | After 18:30 when sheets were taken off. | | | | | | |
| Feb. 9 | | $eP_E$? | 0 33 31 | | | | | | |
| | | $ePN$ | 0 33 26 | | | | | | No main phase. |
| | | $iS_E$ | 0 42 41 | | | | | | |
| | | $iS_N$ | 0 42 41 | | | | | | |
| | | $eL_N$ | 0 51.5 | 10 | | | | | |
| | | F | Doubtful | | | | | | |
| Feb. 10 | | $eL_E$? | 15 7.2 | 10-11 | | | | | |
| | | $L_E$ | 15 32 | 10 | | | | | |
| | | $L_N$ | 15 42 | 10 | | | | | |
| | | F | 15 42 | | | | | | |
| Feb. 13 | | $L_E$ | 10 13 10 to 10 13 22 | 16 | | | | | No other phases. Amplitude very small. N-S does not show. Heavy micros. |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
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|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Mar. 4 | | $e_N$ | 9 52 18 | | | | | | |
| | | $L_E$ | 10 53 03 | 16 | | | | | |
| | | $L_N$ | 10 54 04 | 16 | | | | | |
| | | F? | | | | | | | |
| Mar. 7 | | $_iP_N$ | 20 41 37 | | | | | | $P_E$ does not show. No other phases. |
| | | $_eS_E$ | 20 48 53 | | | | | | |
| | | $_eS_N$ | 20 48 47 | | | | | | |
| | | F? | | | | | | | |
| Mar. 8 | | $e_{EN}$ | 20 28 15 | | | | | | Possibly not seismic, e possibly sooner. |
| Mar. 10 | | $e_{EN}$ | 15 24 30 | | | | | | |
| | | $i_E$ | 15 32 10 | | | | | | Very heavy micros. |
| | | F | 15 40 | | | | | | No other phases. |
| Mar. 11 | | $e_{EN}$ | 10 55 | | | | | | |
| | | $S_{EN}$ | 10 58 43 | | | | | | |
| | | F? | | | | | | | |
| Mar. 17 | | $_eP_E$ | 11 59 22 | | | | | | |
| | | $_eP_N$ | 11 59 23 | | | | | | |
| | | $P_{R_{N_1}}$ | 12 00 01 | | | | | | |
| | | $P_{R_{N_2}}$ | 12 00 12 | | | | | | |
| | | $_iS_E$ | 12 04 03 | | | | | | |
| | | $_iS_N$ | 12 04 03 | | | | | | |
| | | $_eL_E$ | 12 05 28 | 17 | | | | | |
| | | $_eL_N$ | 12 05 18 | 17 | | | | | |
| | | $M_{N_1}$ | 12 09 12 | 17 | 2.7mm. | | | | |
| | | $M_{E_1}$ | 12 09 21 | 15 | | 9.8mm. | | | |
| | | $M_{N_2}$ | 12 10 19 | 12 | 2.4mm. | | | | |
| | | $M_{E_2}$ | 12 10 36 | 11 | | 3.6mm. | | | |
| | | $M_{N_3}$ | 12 11 56 | 11 | 3.0mm. | | | | |
| | | $M_{E_3}$ | 12 12 23 | 11 | | 2.6mm. | | | |
| | | $M_{N_4}$ | 12 13 24 | 11 | 1.7mm. | | | | |
| | | $M_{E_4}$ | 12 13 38 | 19 | | 2.4mm. | | | |
| | | $M_{N_5}$ | 12 14 12 | 11 | 1.9mm. | | | | |
| | | $M_{E_5}$ | 12 14 48 | 11 | | 1.1mm. | | | |
| | | F | 14 (ca.) | | | | | | |

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*From* April 1 *to* April 30, *19* 26

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|---|---|---|---|---|
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|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13,5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Apr. 5 | | $L_E$ | 0 01 09 | | | | | | |
| | | F? | | | | | | | |
| Apr. 12 | | $_ePE$ | 8 51 08 | | | | | | Sensitivity in N-S component evidently lacking. |
| | | $_ePN$ | 8 51 08 | | | | | | |
| | | $_eSE$ | 9 58 22 | | | | | | |
| | | $_eLE$ | 9 9.3 | 19 | | | | | |
| | | $L_E$ | 9 14 05 | 19 | | | | | |
| | | $L_E$ | 9 33 14 | 24 | | | | | |
| | | $M_{E_1}$ | 9 36 12 | 21 | | 0.6mm. | | | |
| | | $M_{E_2}$ | 9 43 22 | 16 | | 0.8mm. | | | |
| | | $M_{E_3}$ | 9 58 22 | 17 | | 0.4mm. | | | |
| | | F | 11 55 | | | | | | |
| Apr. 16 | | $_eE$ | 0 54 14 | | | | | | |
| | | F? | | | | | | | |
| Apr. 28 | | $_ePE$ | 11 24 03 | | | | | | Heavy micros. |
| | | $_iSE$ | 11 32 09 | | | | | | No trace onN-S. |
| | | $_eLE$ | 11 39.3 | 17 | | | | | |
| | | $L_E$ | 11 41 03 | 23 | | | | | |
| | | F | 13 (ca.) | | | | | | |

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| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 5 | | $i^PE$ | 6 28 53 | | | | | | |
| | | $i^PN$ | 6 28 53 | | | | | | |
| | | $P R_1 E$ | 6 30 24 | | | | | | |
| | | $P R_1 N$ | 6 34 53 | | | | | | |
| | | $e^SE$ | 6 34 53 | | | | | | |
| | | $e^SN$ | 6 34 53 | | | | | | |
| | | $e^LE$ | 6 39 52 | | | | | | |
| | | F | 7 10 | | | | | | |
| May 11 | | eE | 11 35 28 | | | | | | |
| | | $e^LE$ | 11 38 09 | | | | | | |
| | | $e^LN$ | 11 38 09 | | | | | | |
| | | $L_N$ | 11 39 17 | | | | | | |
| | | $L_E$ | 11 40 18 | 11 | | | | | |
| | | F | 12 (ca.) | | | | | | |
| May 12 | | eE | 15 15 08 | | | | | | |
| | | $L_N$ | 15 17 08 | | | | | | |
| | | $L_E$ | 15 18 51 | 9 | | | | | |
| | | $L_E$ | 15 19 52 | 9 | | | | | |
| | | F | 15 30 | | | | | | |
| May 20 | | eE | 7 24 47 | | | | | | |
| | | eN | 7 24 47 | | | | | | |
| | | F? | | | | | | | |
| May 21 | | eE | 19 18 41 | | | | | | |
| | | eN | 19 18 41 | | | | | | |
| | | F? | | | | | | | |
| May 26 | | $e^PE$ | 17 59 25 | | | | | | F lost in micros. |
| | | $e^PN$ | 17 59 25 | | | | | | |
| | | $e^SE$ | 18 04 03 | | | | | | |
| | | $e^SN$ | 18 04 03 | | | | | | |
| | | $e^LE$ | 18 06 08 | | | | | | |
| | | F? | | | | | | | |
| May 26 | | eE | 20 09 14 | | | | | | |
| | | F? | | | | | | | |
| May 31 | | eE | 13 55 28 | | | | | | |
| | | eN | 13 55 38 | | | | | | |
| | | $L_E$ | 14 56 38 | | | | | | |
| | | F? | | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 3 | | $e_E$ | 5 07 01 | | | | | | |
| | | $e_N$ | 5 07 12 | | | | | | |
| | | $e_E$ | 5 12 43 | | | | | | |
| | | $e_N$ | 5 12 43 | | | | | | |
| | | $e_{LE}$ | 5 27 23 | 17 | | | | | |
| | | $L_E$ | 5 39 19 | 13 | | | | | |
| | | $L_E$ | 5 45 01 | 32 | | | | | |
| | | $L_E$ | 6 04 07 | 17 | | | | | |
| | | F | 6 30 | | | | | | |
| June 4 | | $e_E$ | 0 50 01 | | | | | | |
| | | $e_N$ | 0 50 01 | | | | | | |
| | | $i_E$ | 0 56 12 | | | | | | |
| | | $i_N$ | 0 56 12 | | | | | | |
| | | $i_E$ | 0 58 01 | | | | | | |
| | | F | 1 10 | | | | | | |
| June 5 | | $e_E$ | 1 34 32 | | | | | | |
| | | $e_N$ | 1 34 32 | | | | | | |
| | | $e_E$ | 1 39 07 | | | | | | |
| | | $e_N$ | 1 39 09 | | | | | | |
| | | $L_N$ | 1 52 26 | | | | | | |
| | | F | ? | | | | | | |
| June 5 | | $P_E$ | 19 57 50 | | | | | | |
| | | $S_E$ | 20 03 51 | | | | | | |
| | | $S_N$ | 20 03 51 | | | | | | |
| | | $i_E$ | 20 04 19 | | | | | | |
| | | $e_{LE}$ | 20 7.4 | | | | | | |
| | | $e_{LN}$ | 20 7.4 | | | | | | |
| | | $L_E$ | 20 12 16 | 10 | | | | | |
| | | $L_N$ | 20 12 16 | 10 | | | | | |
| | | $L_E$ | 20 14 00 | 13 | | | | | |
| | | $L_N$ | 20 14 20 | 9 | | | | | |
| | | F | 21 05 | | | | | | |
| June 20 | | $i_E$ | 7 18 49 | | | | | | |
| | | $i_N$ | 7 18 49 | | | | | | |
| | | $e_{LN}$ | 7 28.0 | .16 | | | | | |
| | | F | ? | | | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

## Seismological Bulletin

of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N $\lambda$=77° 4′ 24″ W h=42.4 m Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 26 | | $_ePE$ | 19 58 21 | | | | | | Slight indication at 19-58-13. Possibly not seismic. |
| | | $_ePN$ | 19 58 22 | | | | | | |
| | | $P_{R1_E}$ | 20 01 29 | | | | | | |
| | | $_iSE$ | 20 08 11 | | | | | | |
| | | $_iSN$ | 20 08 14 | | | | | | |
| | | $S_{R1_E}$ | 20 13 21 | | | | | | Micros. |
| | | $_eLE$ | 20 23.0 | 18 | | | | | |
| | | $_eLN$ | 20 22.8 | 20 | | | | | |
| | | $L_N$ | 20 29 38 | 21 | | | | | |
| | | $L_E$ | 20 30 07 | 19 | | | | | |
| | | F | 21 (ca.) | | | | | | |
| June 29 | | $_eN$ | 14 50 47 | | | | | | Micros. |
| | | $_eE$ | 14 55 10 | | | | | | |
| | | $_eN$ | 14 55 14 | | | | | | |
| | | $_eL_E$ | 15 10.0 | | | | | | |
| | | $_eL_N$ | 15 10.2 | | | | | | |
| | | $L_E$ | 15 15 26 | 14 | | | | | |
| | | $L_E$ | 15 19 36 | 21 | | | | | |
| | | $L_E$ | 15 24 00 | 27 | | | | | |
| | | $L_N$ | 15 32 24 | 21 | | | | | |
| | | F | 16 20 | | | | | | |
| June 29 | | $_eE$ | 19 10 | | | | | | |
| | | $_eL_E$ | 19 14 04 | 11 | | | | | |
| | | $_eL_N$ | 19 14 58 | 11 | | | | | |
| | | $L_E$ | 19 15 11 | 11 | | | | | |
| | | F | 20 (ca.) | | | | | | |
| June 29 | | $_eE$ | 13 38 58 | | | | | | |
| | | $_eN$ | 13 38 58 | | | | | | |
| | | $_eL_E$? | 13 41 58 | | | | | | |
| | | $_eL_N$? | 13 41 58 | | | | | | |
| | | F | 13 51 | | | | | | |
| June 30 | | $L_E$ | 23 14 53 | | | | | | |
| | | F | ? | | | | | | |

Francis A. Tondorf, S. J.,
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

135 - 192

GEORGETOWN UNIVERSITY
SEISMOLOGICAL OBSERVATORY
West Washington
District of Columbia

Constants of the Galitzin Vertical Seismograph.

Stationary Mass----------25 kilos.
Equivalent length of Pendulum---41.09
Period of Pendulum (undamped)--- 9.10
$(mu)^2$---------- 0.032. This represents combined damping of pend. and galv.

A (distance from galv. to recording sheet) 177.5cm.

F. A. Tondorf
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

No. 135 *From* Jan. 1 *to* Jan. 31, *19* 28

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### of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 1 | | $_iP_Z$ | 9 32 02 | | | | | | |
| | | $P R_{1Z}$ | 9 33 40 | | | | | | |
| | | $S_Z$ | 9 37 54 | | | | | | |
| | | $M_{1Z}$ | 9 48 09 | | | | 15.5 mm | | |
| | | $M_{2Z}$ | 9 49 48 | | | | 13.2 mm | | |
| | | $M_{3Z}$ | 9 52 10 | | | | 14.7 mm | | |
| | | $M_{4Z}$ | 9 56 08 | | | | 19.3 mm | | |
| | | $M_{5Z}$ | 9 57 23 | | | | 13.0 mm | | |
| | | F | 11 30 | | | | | | |
| Jan. 2 | | $e_Z$ | 15 03 26 | | | | | | Heavy Micros. |
| | | $_eL_Z$ | 15 22 22 | | | | | | |
| | | $L_Z$ | 15 25 10 | | | | | | |
| | | F | 15 45 | | | | | | |
| Jan. 4 | | $e_Z$ | 21 23 36 | | | | | | |
| | | $_eL_Z$ | 22 29 38 | | | | | | $_eL_Z$ may be sooner. Heavy micros. |
| | | $M_{1Z}$ | 22 35 21 | | | | 5.0 mm | | |
| | | $M_{2Z}$ | 22 40 00 | | | | 4.8 mm | | |
| | | $M_{3Z}$ | 22 49 28 | | | | 4.4 mm | | |
| | | F | 24 30 | | | | | | |
| Jan. 5 | | $_iP_Z$ | 21 55 20 | | | | | | No distinct M |
| | | $_iS_Z$ | 22 02 44 | | | | | | Very heavy M. |
| | | $_eL_Z$ | 22 10 21 | | | | | | |
| | | F | 22 50 | | | | | | |
| Jan. 6 | | $_eP_Z$? | 19 46 22 | | | | | | S is very uncertain. |
| | | $_iP R_{1Z}$ | 19 50 48 | | | | | | |
| | | $S_Z$? | 19 59 22 | | | | | | |
| | | $_eL_Z$ | 20 22 16 | | | | | | |
| | | $M_{1Z}$ | 20 34 00 | | | | 16.0 mm | | |
| | | $M_{2Z}$ | 20 38 31 | | | | 22.0 mm | | |
| | | $F_Z$ | 23 (ca.) | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 9 | | $e_Z$ | 13 53 | | | | | | eL is uncertain |
| | | $e_Z$ | 13 56 | | | | | | |
| | | $e L_Z$? | 13 59 19 | | | | | | |
| | | $M_Z$ | 14 02 14 | | | | 4.7 mm. | | |
| | | $F_Z$ | 14 30 | | | | | | |
| Jan. 10 | | $e_Z$ | 17 01 28 | | | | | | |
| | | $S_Z$? | 17 09 58 | | | | | | Difficult |
| | | $L_Z$ | 17 22 40 | | | | | | |
| | | $M_Z$ | 17 28 06 | | | | 3.8 mm. | | |
| | | $F_Z$ | 18 15 | | | | | | |
| Jan 10. | | $e_Z$ | 6 06 19 | | | | | | $e_Z$ may be as early as 6:01 |
| | | $e L_Z$ | 6 12 | | | | | | Micros are heavy. |
| | | $L_Z$ | 6 16 25 | | | | | | |
| | | F | 6 30(postea?) | | | | | | |
| Jan. 10 | | $e_Z$? | 2 49 17 | | | | | | Micros are heavy. |
| | | $i_Z$ | 2 54 21 | | | | | | |
| | | $e_Z$ | 2 55 59 | | | | | | |
| | | $e L_Z$ | 3 27 23 | | | | | | |
| | | $M_Z$ | 3 31 09 | | | | 4.3 mm. | | |
| | | F | 4 07 | | | | | | |
| Jan. 12 | | $i P_Z$ | 13 17 44 | | | | | | |
| | | $S_Z$ | 13 26 48 | | | | | | |
| | | $S_R$ | 13 32 10 | | | | | | |
| | | $l_Z$ | | | | | | | |
| | | $e L_Z$ | 13 37 19 | | | | | | |
| | | $M_Z$ | 13 51 08 | | | | 3.9 mm. | | |
| | | F | 14 20 | | | | | | |
| Jan. 19 & 20 | | | | | | | | | Driving clock under repair. |
| Jan. 22 | | $e_Z$ | 17 28 30 | | | | | | Heavy micros. |
| | | $e_Z$ | 17 45 08 | | | | | | |
| | | F | 18(postea?) | | | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS

No. 130 *From* Feb. 1 *to* Feb. 29, *19* 28

# Washington, D. C.

# Seismological Bulletin

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 1 | | $L_Z$ | 0 08 09 | | | | | | Sheet down at 0 hrs.08 min. |
| | | $L_Z$ | 0 14 02 | | | | | | |
| | | F | 0 48 | | | | | | Heavy micros. |
| Feb. 1 | | $e_Z$ | 11 23 01 | | | | | | |
| | | $e L_Z$? | 11 38 33 | | | | | | |
| | | $L_Z$ | 11 53 37 | | | | | | |
| | | $L_Z$ | 12 03 29 | | | | | | |
| | | F | 12 15 | | | | | | |
| Feb. 2 | | $eP'$ | 0 30 26 | | | | | | |
| | | $PR1_Z$ | 0 33 39 | | | | | | |
| | | $L_Z$ | 0 58 32 | | | | | | |
| | | F | doubtful | | | | | | Mixed with heavy micros. |
| Feb. 3 | | $iP_Z$ | 13 58 45 | | | | | | |
| | | $PR1_Z$ | 14 01 26 | | | | | | |
| | | $eL_Z$ | 14 25 27 | | | | | | Doubtful |
| | | $M1_Z$ | 14 30 20 | | | | 5.1mm. | | |
| | | $M2_Z$ | 14 36 26 | | | | 6.9mm. | | |
| | | $M3_Z$ | 14 37 46 | | | | 13.5mm. | | |
| | | F | mixed with heavy micros. | | | | | | |
| Feb. 4 | | $L_Z$ | 7 20 31 | 10 | | | | | Heavy micros prevailing. |
| | | $L_Z$ | 7 22 15 | 18 | | | | | |
| | | F | 7 33 | | | | | | |
| Feb. 5 | | $e_Z$ | 23 40 26 | | | | | | Sheets off at 0 hrs.04 m. |
| | | $L_Z$ | 23 47 06 | 10 | | | | | Quake still on |
| | | $L_Z$ | 23 52 08 | 15 | | | | | Micros extra-ordinarily heavy |
| | | $L_Z$ | 23 55 18 | 17 | | | | | P' not certain |
| Feb. 7 | | $P'_Z$ | 0 23 39 | | | | | | |
| | | $PR1_Z$ | 0 27 05 | | | | | | May be read earlier. |
| | | $i_Z$ | 0 45 23 | | | | | | Micros very heavy. |
| | | $L_Z$ | 1 28 19 | 19 | | | | | |
| | | $M1_Z$ | 1 31 15 | 16 | | | 10.mm. | | |
| | | $M2_Z$ | 1 32 13 | 26 | | | 8.1mm. | | |
| | | $M3_Z$ | 1 35 56 | 16 | | | 9.4mm. | | |
| | | $M4_Z$ | 1 38 47 | 16 | | | 8.6mm. | | |
| | | F | 3 (ca.) | | | | | | |
| Feb. 7 | | $i_Z$ | 6 24 44 | | | | | | |
| | | $i_Z$ | 6 25 10 | | | | | | |
| | | $i_Z$ | 6 27 30 | | | | | | |
| | | F | 6 31 | | | | | | |
| Feb. 10 | | $i_Z$ | 6 08 37 | | | | | | No other phases show. |
| | | F | Not clear. | | | | | | Micros heavy |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 10 | | $iP_Z$ | 4 44 16 | | | | | | |
| | | $i_Z$ | 4 44 40 | | | | | | |
| | | $S_Z$ | 4 49 37 | | | | | | |
| | | $M1_Z$ | 4 59 13 | 8 | | | 11.9mm. | | |
| | | $M2_Z$ | 4 59 53 | 8 | | | 11.0mm. | | |
| | | $M3_Z$ | 5 01 35 | 9 | | | 12.0mm. | | |
| | | F | 6 05 | | | | | | |
| Feb. 12 | | $e_Z$ | 16 03 41 | | | | | | |
| | | $i_Z$ | 16 04 41 | | | | | | |
| | | $L_Z$ | 16 39 10 | 5-6 | | | | | |
| | | F | 16 45 | | | | | | |
| Feb. 13 | | $e_Z$ | 5 57 38 | | | | | | |
| | | $eL_Z$ | 6 15 19 | | | | | | $eL_Z$ is doubtful |
| | | F | Deep in micros. | | | | | | |
| Feb. 21 | | $iP_Z$ | 19 58 31 | | | | | | Micros very heavy. Sheets taken off at 23 hrs. Quake still on. |
| | | $i_Z$ | 19 59 33 | | | | | | |
| | | $PR1_Z$ | 20 00 53 | | | | | | |
| | | $PR2_Z$ | 20 02 08 | | | | | | $PR_2$ is doubtful. |
| | | $iS_Z$ | 20 06 18 | | | | | | |
| | | $eL_Z$ | 20 11 15 | 13 | | | | | |
| | | $L_Z$ | 20 16 01 | 11 | | | | | |
| | | $M1_Z$ | 20 19 42 | 8 | | | 61.mm. | | |
| | | $M2_Z$ | 20 20 26 | 8 | | | 38.mm. | | |
| | | $M3_Z$ | 20 23 52 | 11 | | | 92.2mm. | | |
| | | $M4_Z$ | 20 25 28 | 9 | | | 56.7mm | | |
| | | $M5_Z$ | 20 27 42 | 12 | | | 55.7mm. | | |
| | | F | 23(et postea) | | | | | | |
| Feb. 22 | | $i_Z$ | 13 03 19 | | | | | | Micros moderate. |
| | | $eL_Z$ | 13 57 13 | 11 | | | | | |
| | | $L_Z$ | 14 04 10 | 16 | | | | | |
| | | $M_Z$ | 14 07 14 | 14 | | | 3.3mm. | | |
| | | F | 14 47 | | | | | | |
| Feb. 24 | | $P_Z$? | 14 20 12 | | | | | | |
| | | $eL_Z$ | 14 37 29 | 8 | | | | | |
| | | $M1_Z$ | 14 41 04 | 8 | | | 18.3mm. | | Heavy micros. |
| | | $M2_Z$ | 14 42 31 | 6 | | | 10.5mm. | | |
| | | $M3_Z$ | 14 45 04 | 10 | | | 16.7mm. | | |
| | | $M4_Z$ | 14 47 46 | 12 | | | 16.0mm. | | |
| | | $M5_Z$ | 14 54 14 | 12 | | | 9.6mm. | | |
| | | F | 15 55 | | | | | | |
| Feb. 25 | | $e_Z$ | 1 20 59 | | | | | | Heavy micros. |
| | | $L_Z$ | 1 25 10 | | | | | | |
| | | $M_Z$ | 1 35 04 | | | | | | |
| | | F | 1 40 | | | | | | |
| Feb. 25 | | $i_Z$ | 11 17 52 | | | | | | |
| | | $i_Z$ | 11 34 38 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 25 | | $i_Z$ | 11 17 52 | | | | | | |
| | | $i_Z$ | 11 34 38 | | | | | | |
| | | F | Doubtful. | | | | | | |
| Feb. 26 | | $e_Z$ | 1 28 04 | | | | | | |
| | | $S_Z$ | 1 35 03 | | | | | | |
| | | $eL_Z$ | 1 40 54 | | | | | | |
| | | $Ml_Z$ | 1 48 41 | 7 | | | 19.6mm. | | |
| | | $M2_Z$ | 1 49 48 | 9-10 | | | 61.0mm. | | |
| | | $M3_Z$ | 1 50 41 | 13 | | | 32.8mm. | | |
| | | $M4_Z$ | 1 53 11 | 13 | | | 22.6mm. | | |
| | | $M5_Z$ | 1 54 12 | 17 | | | 61.3mm. | | |
| | | $M6_Z$ | 1 56 35 | 9-10 | | | 44.0mm. | | |
| | | $M7_Z$ | 1 57 41 | 10 | | | 43.3mm. | | |
| | | $M8_Z$ | 1 59 02 | 8 | | | 31.1mm. | | |
| | | F | Difficult | | | | | | Heavy micros. |
| Feb. 26 | | $e_Z$ | 3 21 11 | | | | | | May be $P_Z$ |
| | | $S_Z$ | 3 28 36 | | | | | | S doubtful. |
| | | $eL_Z$ | 3 33 17 | | | | | | Heavy micros. |
| Feb. 28 | | $i_Z$ | 2 23 39 | | | | | | |
| | | $i_Z$ | 2 30 08 | | | | | | |
| | | $eL_Z$ | 2 51 20 | 11 | | | | | |
| | | $L_Z$ | 2 53 51 | 14 | | | | | |
| | | $M_Z$ | 2 56 15 | 13 | | | 3.0mm. | | |
| | | $F_Z$ | 3 07 | | | | | | |
| Feb. 28 | | $e_Z$ | 8 56 58 | | | | | | Heavy micros. |
| | | $i_Z$ | 8 58 31 | | | | | | |
| | | $L_Z$ | 9 56 33 | 8-9 | | | | | |
| | | $F_Z$ | 10 30 | | | | | | |
| Feb. 29 | | $i_Z$ | 22 16 56 | | | | | | Have appearance of L waves from nearby quake. Micros heavy. |
| | | $i_Z$ | 22 51 20 | | | | | | |
| | | $L_Z$ | 23 18 05 | 9 | | | | | |
| | | $L_Z$ | 23 22 21 | 18 | | | | | |
| | | $L_Z$ | 23 33 | 14 | | | | | |
| | | $F_Z$ | 24 12 | | | | | | |

Francis A. Tondorf, S. J.,
Director.

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# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Mar. 7 | | $e_Z$ | 23 10 24 | | | | | | |
| | | $e_Z$ | 23 12 06 | | | | | | Heavy micros. |
| | | $e_Z$ | 23 23 20 | | | | | | |
| | | $L_Z$ | 23 45 54 | 20 | | | | | |
| | | $M_{1Z}$ | 23 47 36 | 16 | | | 3mm. | | |
| | | $M_{2Z}$ | 23 50 17 | 14 | | | 3.2mm. | | |
| | | F | 00 40 | | | | | | |
| Mar. 7 | | $e_Z$ | 23 12 00 | | | | | | Micros fairly heavy. |
| | | $e_{L_Z}$ | 23 41 18 | 16 | | | | | |
| | | $L_Z$ | 23 46 14 | 17 | | | | | |
| | | $M_Z$ | 23 47 37 | 18 | | | 3.3mm. | | |
| | | F | 0 30 | | | | | | March 8 |
| Mar. 8 | | $e_Z$ | 18 48 44 | | | | | | |
| | | $e_{L_Z}$ | 18 51 19 | 6-7 | | | | | |
| | | $L_Z$ | 19 00 49 | 5 | | | | | |
| | | $L_Z$ | 19 09 29 | 5 | | | | | |
| | | $L_Z$ | 19 10 39 | 4 | | | | | |
| | | F | 19 20 | | | | | | |
| Mar. 9 | | $i_Z$ | 1 21 19 | | | | | | Heavy micros. |
| | | $L_Z$ | 1 32 07 | 8 | | | | | |
| | | $L_Z$ | 1 37 11 | 4-5 | | | | | |
| | | $L_Z$ | 1 39 00 | 4 | | | | | |
| | | F | 1 58 | | | | | | |
| Mar. 9 | | $e_{P_Z}$ | 11 12 39 | | | | | | ? |
| | | $P_{R1_Z}$ | 11 15 02 | | | | | | ? |
| | | $S_Z$ | 11 22 31 | | | | | | |
| | | $L_Z$ | 11 38 07 | 10 | | | | | |
| | | $L_Z$ | 12 02 20 | 5-6 | | | | | |
| | | $L_Z$ | 12 16 35 | 8 | | | | | |
| | | F | 12 35 | | | | | | |
| Mar.13 | | $i_Z$ | 18 49 15 | | | | | | Possibly P |
| | | $i_Z$ | 18 50 41 | | | | | | |
| | | $i_Z$ | 18 52 20 | | | | | | |
| | | $S_Z$ | 19 01 13 | | | | | | Questionable |
| | | $L_Z$ | 19 34 40 | 14 | | | | | |
| | | $M_{1Z}$ | 19 41 22 | 19 | | | 4.0mm. | | |
| | | $M_{2Z}$ | 19 47 31 | 16 | | | 5.2mm. | | |
| | | F | 21 14 | | | | | | Heavy micros. |
| Mar. 9 | | e Z | 18 20 05 | | | | | | e may be sooner. |
| | | $P_{R1_Z}$ | 18 25 00 | | | | | | Heavy Micros. |
| | | $P_{R2_Z}$ | 18 27 59 | | | | | | |
| | | $S_Z$? | 18 40 06 | | | | | | |
| | | $e_{L_Z}$ | 19 07 28 | 15 | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS

No. 137 bis. *From* Mar. 1 *to* Mar. 31, *19* 28

# Washington, D. C.

# Seismological Bulletin

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Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | $M_{I_Z}$ | 19 27 20 | 21 | | | 33.9mm. | | The other main phases are so large in amplitude as not to permit the following. |
| | | F | 23 (ca.) | | | | | | |
| Mar.13 | | $P'_Z$ | 18 49 15 | | | | | | |
| | | $i_Z$ | 18 50 41 | | | | | | |
| | | $PR_{1_Z}$ | 18 52 22 | | | | | | |
| | | $S_Z$ | 19 01 13 | | | | | | ? |
| | | $SR_{1_Z}$ | 19 03 14 | | | | | | ? |
| | | $eL_Z$ | 19 31 10 | 13 | | | | | |
| | | $L_Z$ | 19 36 47 | 15 | | | | | |
| | | $M_{1_Z}$ | 19 41 20 | 18 | | | 3.8mm. | | |
| | | $M_{2_Z}$ | 19 47 14 | 16 | | | 3.9mm. | | |
| | | F | 21 (ca.) | | | | | | |
| Mar.16 | | $i_Z$ | 5 20 00 | | | | | | |
| | | $PR_{1_Z}$ | 5 22 22 | | | | | | |
| | | $i_Z$ | 5 28 43 | | | | | | |
| | | $i_Z$ | 5 32 27 | | | | | | |
| | | $eL_Z$ | 5 52 49 | 9 | | | | | |
| | | $L_Z$ | 5 59 00 | 40 | | | | | |
| | | $M_{1_Z}$ | 6 03 47 | 21 | | | 79.0mm. | | |
| | | $M_{2_Z}$ | 6 07 24 | 18 | | | 137.0mm. | | |
| | | $M_{3_Z}$ | 6 10 13 | 16 | | | 77.0mm. | | |
| | | $M_{4_Z}$ | 6 14 17 | 14 | | | 116.4mm. | | |
| | | $M_{5_Z}$ | 6 19 06 | 14 | | | 51.8mm. | | |
| | | $M_{6_Z}$ | 6 21 32 | 16 | | | 47.0mm. | | |
| | | $M_{7_Z}$ | 6 23 06 | 15 | | | 53.0mm. | | |
| | | $M_{8_Z}$ | 6 25 43 | 16 | | | 79.5mm. | | |
| | | $M_{9_Z}$ | 6 30 46 | 15 | | | 50.0mm. | | |
| | | $M_{10_Z}$ | 6 35 46 | 17 | | | 62.5mm. | | |
| | | $M_{11_Z}$ | 6 42 16 | 11 | | | 39.8mm. | | |
| | | $M_{12_Z}$ | 7 09 49 | 11 | | | 24.0mm. | | |
| | | $M_{13_Z}$ | 7 16 19 | 18 | | | 27.8mm. | | |
| | | $M_{14_Z}$ | 7 22 07 | 17 | | | 24.7mm. | | |
| | | F | 8 45 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Mar.17 | | $e_Z$ | 3 52 38 | | | | | | Heavy micros. |
| | | $eL_Z$ | 4 04 42 | | | | | | ? |
| | | F | 4 25 | | | | | | |
| Mar.18 | | $e_Z$ | 3 25 04 | | | | | | |
| | | $e_Z$ | 3 28 08 | | | | | | |
| | | $e_Z$ | 3 38 06 | | | | | | Very heavy mi |
| | | $e_Z$ | 3 47 53 | | | | | | Difficult |
| | | $eL_Z$ | 4 02 11 | | | | | | |
| | | $M_{1_Z}$ | 4 07 08 | | | | 5.2mm. | | |
| | | $M_{2_Z}$ | 4 10 57 | | | | 5.0mm. | | |
| | | $M_{3_Z}$ | 4 13 54 | | | | 4.8mm. | | |
| | | F | 5 35 | | | | | | |
| Mar.18 | | $i_Z$ | 15 16 04 | | | | | | |
| | | F | 15 35 | | | | | | Heavy micros. |
| Mar.18 | | $i_Z$ | 20 48 56 | | | | | | |
| | | F | 20 57 | | | | | | Heavy micros. |
| Mar.18 | | $eL_Z$ | 13 01 09 | | | | | | |
| | | $L_Z$ | 13 04 12 | 18 | | | | | Sheets put on 12 hrs. 51 m. |
| | | $M_{1_Z}$ | 13 09 37 | 14 | | | 3.4mm. | | |
| | | $M_{2_Z}$ | 13 13 31 | 10 | | | 3.8mm. | | Heavy Micros. |
| | | F | 14 (ca.) | | | | | | |
| Mar.22 | | $iP_E$ | 4 22 58 | | | | | | $iP_Z$ 4 hrs. 22m 56s. |
| | | $iP_N$ | 4 22 58 | | | | | | The rest of |
| | | $PR_{1_E}$ | 4 23 38 | | | | | | the gram is |
| | | $PR_{1_N}$ | 4 23 38 | | | | | | of such am- |
| | | $S_E$ | 4 27 45 | | | | | | plitude as |
| | | $S_N$ | 4 27 45 | | | | | | to [illegible] a |
| | | $eL_E$ | 4 29 12 | 12 | | | | | c reful and |
| | | $eL_N$ | 4 29 12 | 15 | | | | | so reliable |
| | | $M_{1_E}$ | 4 34 14 | 6 | | 10.8mm. | | | reading im- |
| | | $M_{1_N}$ | 4 34 19 | 10 | 6.4mm. | | | | possible. |
| | | $M_{2_N}$ | 4 35 41 | 17 | 5.7mm. | | | | The amplitudes |
| | | $M_{2_E}$ | 4 36 40 | 7 | | 7.8mm. | | | of the initial |
| | | $M_{3_E}$ | 4 37 42 | 6 | | 7.3mm. | | | phases brought |
| | | $M_{3_N}$ | 4 38 18 | 13 | 6.8mm. | | | | the gram off |
| | | F | 5 30 | | | | | | of the sheets. |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Mar.22 | | $iP_{EN}$ | 4 23 03 | | | | | | |
| | | $P_{R1_N}$ | 4 23 35 | | | | | | |
| | | $P_{R2_{EN}}$ | 4 23 48 | | | | | | |
| | | $iS_{EN}$ | 4 27 49 | | | | | | |
| | | $S_{R1_{EN}}$ | 4 28 36 | | | | | | |
| | | $eL_{EN}$ | 4 29 37 | | | | | | |
| | | $M_{1_E}$ | 4 34 11 | 5-6 | | 14.4mm. | | | |
| | | $M_{1_N}$ | 4 34 15 | 10 | 5.3mm. | | | | |
| | | $M_{2_N}$ | 4 34 53 | 18 | 5.7mm. | | | | |
| | | $M_{2_E}$ | 4 35 00 | 5 | | 10.0mm. | | | |
| | | $M_{3_E}$ | 4 35 39 | 5 | | 10.3mm. | | | |
| | | $M_{3_N}$ | 4 36 19 | 13 | 11.3mm. | | | | |
| | | $M_{4_E}$ | 4 37 00 | 6 | | 7.9mm. | | | |
| | | $M_{4_N}$ | 4 37 41 | 10 | 7.5mm. | | | | |
| | | $M_{5_N}$ | 4 38 19 | 7 | 6.5mm. | | | | |
| | | $M_{5_E}$ | 4 39 08 | 7 | 8.4mm. | | | | |
| | | $M_{6_N}$ | 4 39 29 | 5 | 6.8mm. | | | | |
| | | $M_{6_E}$ | 4 41 30 | 11 | | 5.8mm. | | | |
| | | $M_{7_E}$ | 4 42 51 | 5 | | 8.0mm. | | | |
| Mar.23 | | $e_Z$ | 20 30 31 | | | | | | Heavy Micros. Many long waves of very small amplitude and very irregular period. |
| | | $e_Z$ | 20 40 46 | | | | | | |
| | | $e_Z$ | 20 44 48 | | | | | | |
| | | $eL_Z$ | 20 54 00 | 6 | | | | | |
| | | F | 22 10 | | | | | | No distinct M. |
| Mar.23 | | $i_Z$ | 22 17 42 | | | | | | |
| | | $L_Z$ | 22 25 00 | 7 | | | | | |
| | | $L_Z$ | 22 32 31 | 8 | | | | | Heavy micros. |
| Mar.26 | | F | Lost in micros. | | | | | | |
| | | $e_Z$ | 5 49 13 | | | | | | Heavy micros. |
| | | $L_Z$ | 6 44 38 | 19 | | | | | |
| | | $M_{1_Z}$ | 6 45 36 | 22 | | | 5.0mm. | | |
| | | $M_{2_Z}$ | 6 53 18 | 14 | | | 3.4mm. | | |
| | | F | 9 (postea) | | | | | | |

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No.137 quint. *From* Mar. 1 *to* Mar. 31, 1928

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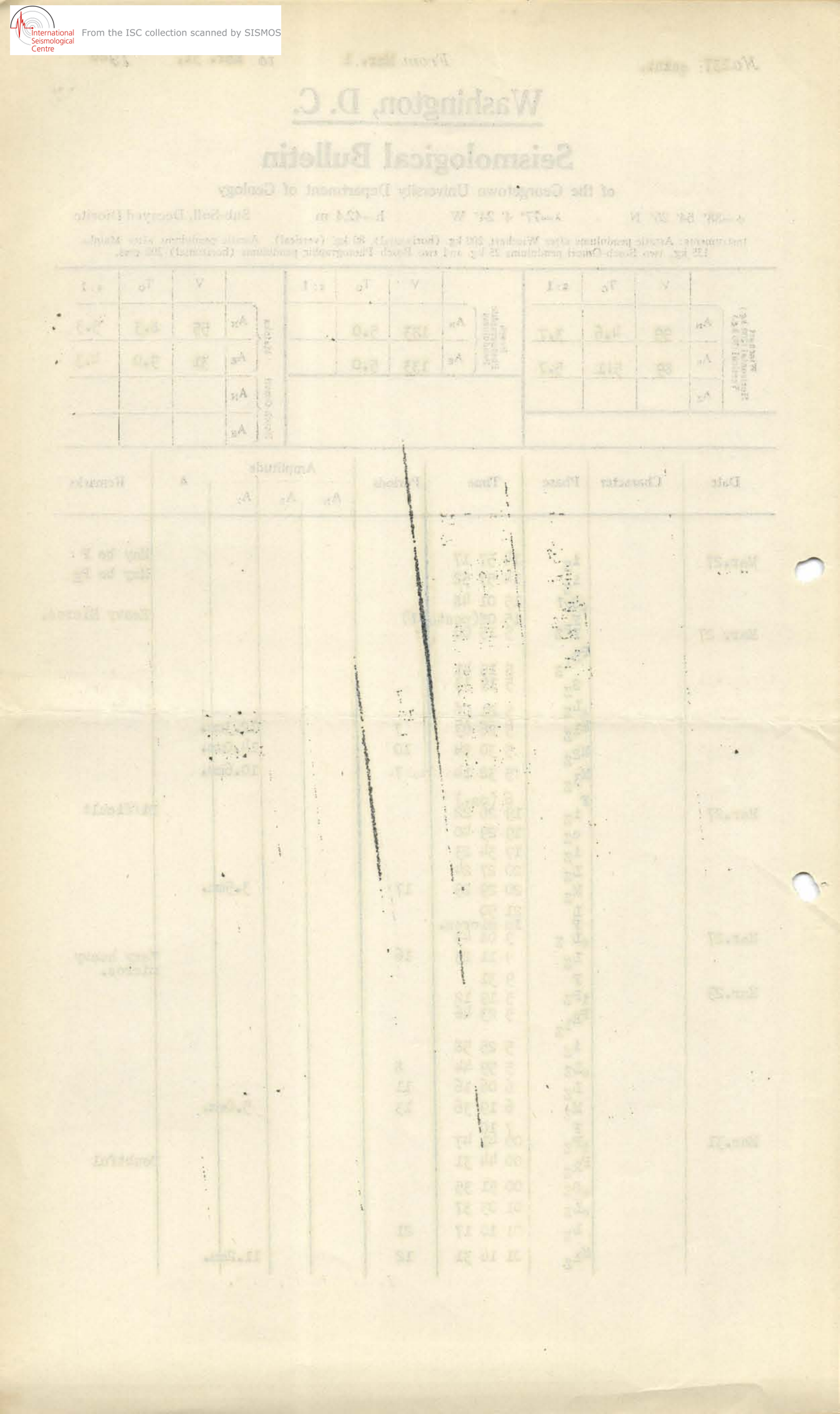
| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Mar.27 | | $i_Z$ | 14 57 17 | | | | | | May be P |
| | | $i_Z$ | 14 57 52 | | | | | | May be $P_R$ |
| | | $e_{S_Z}$? | 15 01 48 | | | | | | |
| | | F | 15 08(poste a?) | | | | | | Heavy Micros. |
| Mar. 27 | | $iP_Z$ | 5 15 06 | | | | | | |
| | | $P_{R_{1Z}}$ | 5 15 41 | | | | | | |
| | | $S_Z$ | 5 19 33 | | | | | | |
| | | $e_{L_Z}$ | 5 21 06 | | | | | | |
| | | $M_{1Z}$ | 5 26 03 | 7 | | | 12.3mm. | | |
| | | $M_{2Z}$ | 5 30 54 | 10 | | | 14.0mm. | | |
| | | $M_{3Z}$ | 5 32 14 | 7 | | | 10.6mm. | | |
| | | F | 6 (ca.) | | | | | | |
| Mar.27 | | $i_Z$ | 19 26 22 | | | | | | Difficult |
| | | $e_Z$ | 19 29 40 | | | | | | |
| | | $i_Z$ | 19 34 23 | | | | | | |
| | | $L_Z$ | 20 27 24 | | | | | | |
| | | $M_Z$ | 20 29 29 | 17 | | | 3.5mm. | | |
| | | L | 21 50 | | | | | | |
| | | F | In micros. | | | | | | |
| Mar.27 | | $e_{L_Z}$ | 9 08 43 | | | | | | |
| | | $L_Z$ | 9 11 23 | 16 | | | | | Very heavy micros. |
| | | F | 9 31 | | | | | | |
| Mar.29 | | $iP_Z$ | 5 19 12 | | | | | | |
| | | $P_{R_{1Z}}$ | 5 23 46 | | | | | | |
| | | $i_Z$ | 5 25 58 | | | | | | |
| | | $e_{L_Z}$ | 5 59 44 | 8 | | | | | |
| | | $L_Z$ | 6 06 16 | 11 | | | | | |
| | | $M_Z$ | 6 19 36 | 13 | | | 5.0mm. | | |
| | | F | 7 10 | | | | | | |
| Mar.31 | | $iP_Z$ | 00 41 47 | | | | | | |
| | | $P_{R_Z}$ | 00 44 31 | | | | | | Doubtful |
| | | $e_{S_Z}$ | 00 51 35 | | | | | | |
| | | $e_{L_Z}$ | 01 05 37 | | | | | | |
| | | $L_Z$ | 01 10 17 | 21 | | | | | |
| | | $M_{1Z}$ | 01 16 31 | 12 | | | 11.2mm. | | |

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| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 3.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | $M_{2_Z}$ | 01 18 57 | 13 | | | 7.8mm. | | |
| | | $M_{3_Z}$ | 01 20 17 | 14 | | | 7.7mm. | | |
| | | $M_{4_Z}$ | 01 24 25 | 23 | | | 7.0mm. | | |
| | | $M_{5_Z}$ | 01 27 24 | 12 | | | 5.9mm. | | |
| | | F | 03 30 | | | | | | |
| Mar.31 | | $e_Z$ | 0 13 13 | | | | | | Sheets down at 0 hrs. 12 m. |
| | | $e_Z$ | 0 16 13 | | | | | | |
| | | $i_Z$ | 0 20 15 | | | | | | |
| | | $i_Z$ | 0 30 29 | | | | | | |
| | | F | In second quake. | | | | | | |

F. A. Tondorf, S. J.
Director

International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Apr. 3 | | $e_Z$ | 1 40 20 | | | | | | ? |
| | | $i_Z$ | 1 52 50 | | | | | | |
| | | $e^L_Z$ | 1 57 | | | | | | ? |
| | | $M_Z$ | 1 58 29 | 8 | | | 4.3mm. | | |
| | | F | 3 (ca.) | | | | | | |
| Apr. 3 | | $e_Z$ | 15 54 37 | | | | | | |
| | | $e_Z$ | 16 05 07 | | | | | | |
| | | $e^L_Z$? | 16 18 33 | | | | | | |
| | | $L_Z$ | 16 20 02 | 23 | | | | | |
| | | $M_{1Z}$ | 16 23 21 | 22 | | | 3.8mm. | | |
| | | $M_{2Z}$ | 16 24 21 | 19 | | | 4.3mm. | | |
| | | $M_{3Z}$ | 16 25 24 | 19 | | | 3.8mm. | | |
| | | $M_{4Z}$ | 16 30 26 | 18 | | | 2.6mm. | | |
| | | F | 18 55 | | | | | | |
| Apr. 7 | | $e^L_Z$? | 20 51 46 | | | | | | Very heavy micros. |
| | | $L_Z$ | 20 56 21 | 7-8 | | | | | |
| | | $M_Z$ | 21 04 06 | 7-8 | | | 2.0mm. | | |
| | | F | 22 (ca.) | | | | | | |
| Apr. 9 | | $iP_Z$ | 17 43 18 | | | | | | |
| | | $P_{R1_Z}$ | 17 44 43 | | | | | | |
| | | $iS_Z$ | 17 50 59 | | | | | | |
| | | $e^L_Z$ | 17 58 25 | | | | | | |
| | | $M_{1Z}$ | 18 04 53 | 25 | | | 33.0mm. | | |
| | | $M_{2Z}$ | 18 06 22 | 19 | | | 29.9mm. | | |
| | | $M_{3ZZ}$ | 18 08 45 | 13 | | | 25.1mm. | | |
| | | $M_{4Z}$ | 18 11 21 | 13 | | | 15.8mm. | | |
| | | $M_{5Z}$ | 18 16 26 | 13 | | | 10.2mm. | | |
| | | $M_{6Z}$ | 18 17 25 | 18 | | | 12.2mm. | | |
| | | $M_{7Z}$ | 18 20 50 | 16 | | | 11.4mm. | | |
| | | F | 20 55 | | | | | | |
| Apr. 10 | | $e_Z$ | 6 16 47 | | | | | | ? Fairly heavy micros. |
| | | $e_Z$ | 6 23 07 | | | | | | |
| | | $e^L_Z$ | 6 30 22 | 9 | | | | | ? |
| | | $L_Z$ | 6 31 44 | 11 | | | | | |
| | | $M_{1Z}$ | 6 40 21 | 12 | | | 3.0mm. | | |
| | | F | 6 59 | | | | | | |

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No. 138 bis.

| DATE | CHARACTER | PHASE | TIME | PERIOD | AMPLITUDE | | | Δ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | $A_N$ | $A_E$ | $A_Z$ | | |
| Apr. 10 | | $e_Z$ | 16 40 03 | | | | | | Heavy micros. |
| | | $i_Z$ | 16 49 10 | | | | | | |
| | | $S_Z$? | | | | | | | |
| | | $M_{1_Z}$ | 17 01 29 | 10-11 | | | 7.6mm. | | |
| | | $M_{2_Z}$ | 17 03 03 | 9 | | | 7.2mm. | | |
| | | F | 17 51 | | | | | | |
| Apr. 10 | | $i_Z$ | 21 38 45 | | | | | | Heavy micros. |
| | | $i_Z$ | 21 40 30 | | | | | | |
| | | $M_Z$ | 21 52 22 | 8 | | | 3.7mm. | | |
| | | F | 22 01 | | | | | | |
| Apr. 12 | | $i_Z$ | 18 19 22 | | | | | | |
| | | $i_Z$ | 18 37 20 | | | | | | |
| | | $L_Z$ | 18 48 15 | 7-8 | | | | | |
| | | F | 19 (ca.) | | | | | | |
| Apr. 13 | | $e^P_Z$ | 23 22 11 | | | | | | This gram not reliable because of binding of Galvanometer mirror. |
| | | $S_Z$? | 23 27 20 | | | | | | |
| | | $M_{1_Z}$ | 23 38 55 | 9 | | | 4.2mm. | | |
| | | F | 0 45 | | | | | | |
| Apr. 14 | | $P_Z$ | 9 11 22 | | | | | | |
| | | $S_Z$ | 9 20 14 | | | | | | |
| | | $L_Z$ | 9 35 22 | 8 | | | | | |
| | | $M_{1_Z}$ | 9 44 40 | 12 | | | 0.9mm. | | |
| | | $M_{2_Z}$ | 9 50 28 | 12 | | | 1.0mm. | | Galvanometer mirror not satisfactorily free as yet. |
| | | F | 11 20 | | | | | | |
| Apr. 17 | | $e^P_E$ | 3 31 01 | | | | | | |
| | | $e^P_N$ | 3 31 01 | | | | | | |
| | | $P_{R_{1_E}}$ | 3 31 37 | | | | | | |
| | | $P_{R_{1_N}}$ | 3 31 38 | | | | | | |
| | | $P_{R_{2_E}}$ | 3 31 58 | | | | | | |
| | | $P_{R_{2_N}}$ | 3 31 58 | | | | | | |
| | | $i^S_E$ | 3 35 42 | | | | | | |
| | | $i^S_N$ | 3 35 42 | | | | | | |
| | | $S_{R_{1_E}}$ | 3 36 41 | | | | | | |
| | | $S_{R_{1_N}}$ | 3 36 41 | | | | | | |
| Apr. 17 | | $i^P_Z$ | 3 30 59 | | | | | | |
| | | $P_{R_{1_Z}}$ | 3 31 38 | | | | | | |
| | | $i^S_Z$ | 3 35 43 | | | | | | |
| | | $e^L_Z$ | 3 37 52 | | | | | | |
| | | $M_{1_Z}$ | 3 44 36 | 19 | | | 61.8mm. | | |
| | | $M_{2_Z}$ | 3 47 01 | 12 | | | 55.8mm. | | |
| | | $M_{3_Z}$ | 3 48 05 | 10 | | | 39.0mm. | | |
| | | $M_{4_Z}$ | 3 50 23 | 12-13 | | | 33.8mm. | | |
| | | $M_{5_Z}$ | 3 56 46 | 12 | | | 33.7 | | |
| | | F | 5 54 | | | | | | |

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Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert (200 kg.) Horizontal (80 kg.) Vertical | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 1 | | $e_Z$ | 00 24 | | | | | | Sheet changed at 00 hrs 24m. Quake then on. |
| | | $iS_Z$ | 00 32 39 | | | | | | |
| | | $eL_Z$ | 00 44 27 | 9-10 | | | | | |
| | | $M_Z$ | 01 00 01 | 19 | | | 2.4mm. | | |
| | | F | 01 45 | | | | | | |
| May 1 | | $e_Z$ | 02 28 45 | | | | | | Difficult |
| | | $e_Z$ | 02 36 24 | | | | | | |
| | | $e_Z$ | 02 43 21 | | | | | | |
| | | F | 02 50 | | | | | | |
| May 1 | | $e_Z$ | 09 53 43 | | | | | | |
| | | $L_Z$ | 09 58 42 | 10 | | | | | |
| | | $F_Z$ | 10 04 | | | | | | |
| May 1 | | $i_Z$ | 19 04 29 | | | | | | May be P. |
| | | $i_Z$ | 19 06 07 | | | | | | |
| | | $eL_Z$ | 19 16 16 | | | | | | |
| | | $M1_Z$ | 19 25 23 | 6 | | | 11.9mm. | | |
| | | $M2_Z$ | 19 26 27 | 6 | | | 12.0mm. | | |
| | | $M3_Z$ | 19 29 48 | 13 | | | 20.2mm. | | |
| | | $M4_Z$ | 19 30 52 | 13 | | | 21.5mm. | | |
| | | $F_Z$ | 21 15 | | | | | | |
| May 2 | | $e_Z$ | 12 05 06 | | | | | | Difficult. |
| | | $e_Z$ | 12 13 06 | | | | | | |
| | | $eL_Z$ | 12 18 58 | | | | | | |
| | | $L_Z$ | 12 20 24 | 18 | | | | | |
| | | $F_Z$ | 12 38 | | | | | | |
| May 2 | | $L_Z$ | 14 00 32 | | | | | | |
| | | $F_Z$ | 14 06 | | | | | | |
| May 2 | | $eL_Z$ | 15 40 15 | | | | | | Doubtful. Heavy micros. |
| | | $L_Z$ | 15 44 16 | | | | | | |
| | | $F_Z$ | 16 (ca.) | | | | | | |
| May 2 | | $iP_Z$ | 22 06 25 | | | | | | |
| | | $iS_Z$ | 22 16 13 | | | | | | ? |
| | | $eL_Z$ | 22 29 59 | | | | | | |
| | | $L_Z$ | 22 34 40 | 21-22 | | | | | |
| | | $M1_Z$ | 22 38 48 | 18 | | | 4.4mm. | | |
| | | $M2_Z$ | 22 40 54 | 14 | | | 5.3mm. | | |
| | | $M3_Z$ | 22 47 33 | 14 | | | 6.3mm. | | |
| | | $F_Z$ | 23 30 (ca.) | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | △ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| May 7 | | $_eL_Z$ | 22 08 10 | | | | | | |
| | | $L_Z$ | 22 14 22 | 8 | | | | | |
| | | $F_Z$ | | | | | | | ? |
| May 8 | | $i_Z$ | 04 57 29 | | | | | | Possibly P' |
| | | $i_Z$ | 05 00 29 | | | | | | |
| | | $i_Z$ | 05 03 35 | | | | | | |
| | | $_eL_Z$ | 05 11 11 | 8 | | | | | ? |
| | | $L_Z$ | 05 17 12 | | | | | | |
| | | $F_Z$ | 06 16 | | | | | | |
| May 10 | | $e_Z$ | 02 45 57 | | | | | | |
| | | $e_Z$ | 02 53 38 | | | | | | |
| | | $e_Z$ | 02 58 47 | | | | | | |
| | | $e_Z$ | 02 59 31 | | | | | | |
| | | $F_Z$ | 03 (ca.) | | | | | | |
| May 10 | | $e_Z$ | 08 39 58 | | | | | | |
| | | $_eL_Z$ | 08 48 22 | 11 | | | | | |
| | | $F_Z$ | 09 05 (ca.) | | | | | | |
| May 12 | | $e_Z$? | 20 35 40 | | | | | | |
| | | $i_Z$ | 20 38 44 | | | | | | |
| | | $e_Z$ | 20 50 22 | | | | | | |
| | | $L_E$ | 21 00 47 | 14 | | | | | |
| | | $M_{1_Z}$ | 21 05 06 | 9 | | | 2.2mm. | | |
| | | $M_{2_Z}$ | 21 07 50 | | | | 2.0mm. | | |
| | | $F_Z$ | 21 50 | | | | | | |
| May 14 | | $iP_Z$ | 22 22 57 | | | | | | |
| | | $_eP_E$ | 22 23 02 | | | | | | |
| | | $iP_N$ | 22 22 59 | | | | | | |
| | | $iS_Z$ | 22 29 38 | | | | | | |
| | | $iS_E$ | 22 29 46 | | | | | | |
| | | $IS_N$ | 22 29 39 | | | | | | |
| | | $_eL_E$ | 22 36 41 | | | | | | |
| | | $_eL_N$ | 22 36 41 | | | | | | |
| | | $M_{1_Z}$ | 22 37 44 | | | | 57.0mm. | | Other maxima in Z are of such amplitude as to be off the sheets |
| | | $M_{2_Z}$ | 22 38 50 | | | | 74.0mm. | | |
| | | F ENZ | In next quake | | | | | | Z component difficult to read because of large amplitude in all phases. |
| May 15 | | $iP_Z$ | 02 44 32 | | | | | | |
| | | $P_{R_{1_Z}}$ | 02 46 10 | | | | | | |
| | | $iS_Z$ | 02 51 07 | | | | | | |
| | | $S_{R_{1_Z}}$ | 02 54 31 | | | | | | |
| | | $M_{1_Z}$ | 03 03 07 | 12-13 | | | 12.3mm. | | |
| | | $M_{2_Z}$ | 03 03 42 | 14-15 | | | 8.7mm. | | |
| | | $M_{3_Z}$ | 03 04 19 | 15 | | | 7.0mm. | | |
| | | $M_{4_Z}$ | 03 07 53 | 16 | | | 8.0mm. | | |
| | | $M_{5_Z}$ | 03 11 40 | 15 | | | 7.1mm. | | |
| | | $F_Z$ | 04 58 | | | | | | |
| May 16 | | $P_Z$ | 05 24 13 | | | | | | |
| | | $S_Z$ | 05 33 22 | | | | | | |
| | | $M_Z$ | 05 57 57 | 9 | | | 3.8mm. | | |
| | | $F_Z$ | 07 10 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | $\Delta$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 16 | | $iP_Z$ | 08 05 00 | | | | | | |
| | | $P_{R_1Z}$ | 08 06 31 | | | | | | |
| | | $S_Z$ | 08 11 27 | | | | | | |
| | | $eL_Z$ | 08 15 26 | 15 | | | | | |
| | | $M_Z$ | 08 23 22 | 17 | | | 3.2mm. | | |
| | | $F_Z$ | 09 05 | | | | | | |
| May 17 | | $e_Z$ | 11 02 35 | | | | | | |
| | | $i_Z$ | 11 14 45 | | | | | | |
| | | $i_Z$ | 11 17 12 | | | | | | |
| | | $i_Z$ | 11 22 43 | | | | | | |
| | | $M_Z$ | 11 29 30 | | | | 2.0mm. | | |
| | | $F_Z$ | 12 40 | | | | | | |
| May 17 | | $e_Z$ | 23 43 52 | | | | | | No distinct M. |
| | | $L_Z$ | 23 48 24 | 10 | | | | | |
| | | $F_Z$ | 24 05 | | | | | | |
| May 18 | | $e_Z$ | 02 25 06 | | | | | | Possibly P |
| | | $e_Z$ | 02 35 09 | | | | | | |
| | | $L_Z$ | 02 55 09 | 14 | | | | | |
| | | $M_Z$ | 02 58 02 | 14 | | | 3.2mm. | | |
| | | $F_Z$ | In following quake | | | | | | |
| May 18 | | $e_Z$ | 03 24 02 | | | | | | |
| | | $eL_Z$ | 03 50 | | | | | | |
| | | $M_Z$ | 03 58 11 | 18-19 | | | 2.2mm. | | |
| | | $F_Z$ | 04 16 | | | | | | |
| May 19 | | $e_Z$ | 04 08 47 | | | | | | Doubtful. |
| | | $eL_Z$ | 04 39 20 | 9 | | | | | |
| | | $L_Z$ | 04 44 25 | 18 | | | | | |
| | | $M_Z$ | 04 47 42 | | 14 | | | | |
| | | $F_Z$ | 05 33 | | | | | | |
| May 19 | | $e_Z$ | 09 49 (ca.) | | | | | | ? |
| | | $eL_Z$ | 10 26 25 | 13 | | | | | ? |
| | | $F_Z$ | 11 27 | | | | | | Difficult. |
| May 20 | | $e_Z$ | 17 03 46 | 10 | | | | | Possibly $eL_Z$ |
| | | $F_Z$ | 17 20 | | | | | | |
| May 21 | | $e_Z$ | 02 24 40 | | | | | | |
| | | $L_Z$ | 02 28 13 | 10 | | | | | |
| | | $M_{1Z}$ | 02 35 14 | 9 | | | 3.3mm. | | |
| | | $M_{2Z}$ | 02 36 43 | 11 | | | 3.7mm. | | |
| | | $F_Z$ | 03 10 | | | | | | |
| May 21 | | $e_Z$ | 13 53 47 | | | | | | |
| | | $L_Z$ | 14 14 38 | 9 | | | | | |
| | | $F_Z$ | 14 25 | | | | | | |
| May 21 | | $i_Z$ | 17 10 41 | | | | | | Possibly P. |
| | | $i_Z$ | 17 17 17 | | | | | | |
| | | $eL_Z$ | 17 26 21 | | | | | | |
| | | $M_Z$ | 17 30 28 | 11 | | | 1.8mm. | | |
| | | $F_Z$ | 18 45 | | | | | | |
| May 24 | | $eP_Z$ | 05 44 51 | | | | | | ? |
| | | $S_Z$ | 05 52 04 | | | | | | |
| | | $eL_Z$ | 05 58 13 | | | | | | ? |
| | | $L_Z$ | 05 59 06 | 11 | | | | | |
| | | $M_Z$ | 06 06 42 | 11 | | | 3.6mm. | | |
| | | $F_Z$ | 06 50 | | | | | | |

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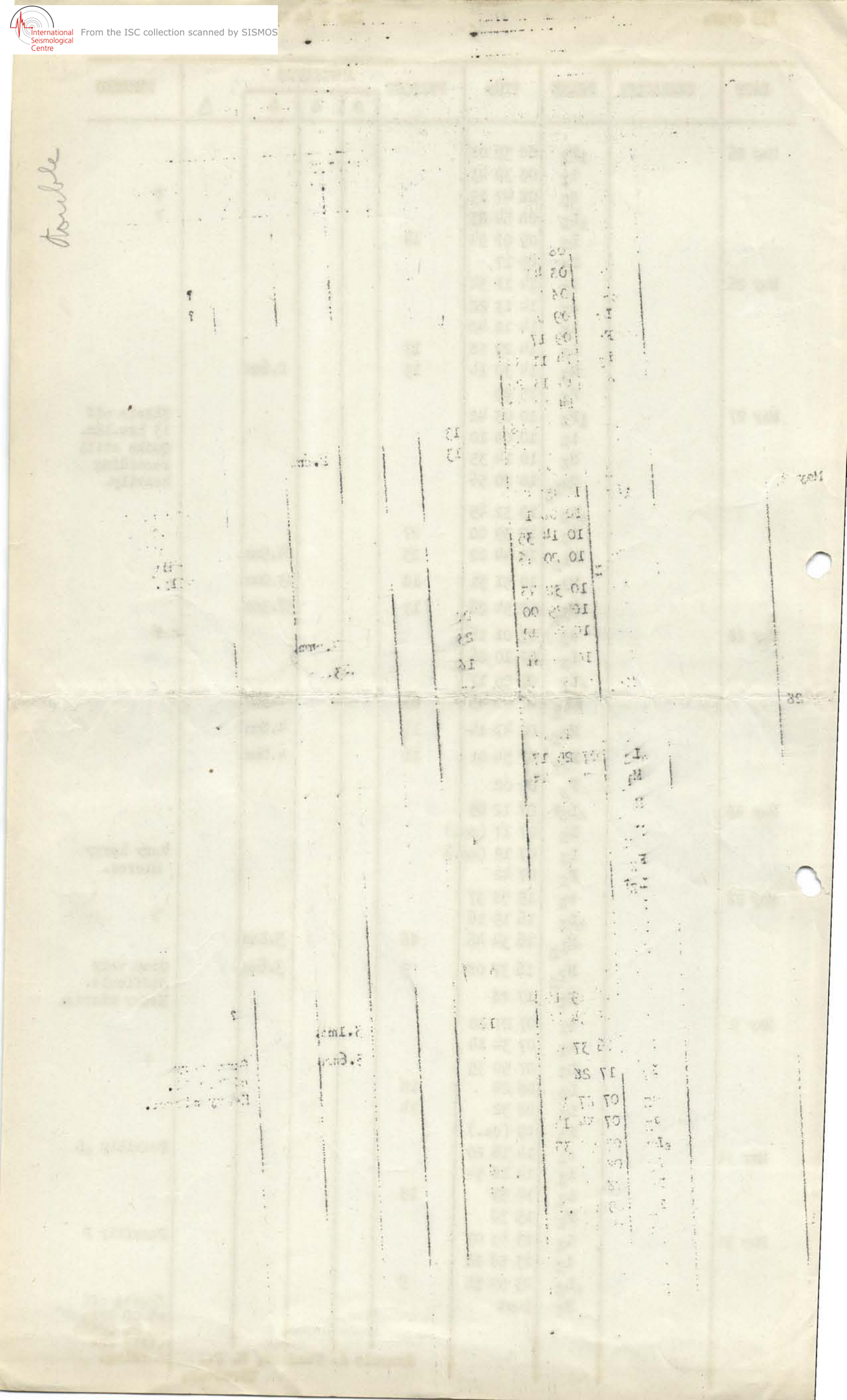
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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE A | AMPLITUDE A | AMPLITUDE A | Δ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| May 26 | | $_iP_Z$ | 08 39 08 | | | | | | |
| | | $_iZ$ | 08 39 43 | | | | | | |
| | | $S_Z$ | 08 47 19 | | | | | | ? |
| | | $_eL_Z$ | 08 54 23 | | | | | | ? |
| | | $L_Z$ | 09 07 54 | 14 | | | | | |
| | | $F_Z$ | 09 17 | | | | | | |
| May 26 | | $i_Z$ | 14 11 34 | | | | | | |
| | | $e_Z$ | 14 13 22 | | | | | | |
| | | $i_Z$ | 14 18 42 | | | | | | |
| | | $L_Z$ | 14 29 18 | 13 | | | | | |
| | | $M_Z$ | 14 30 14 | 13 | | | 2.6mm. | | |
| | | $F_Z$ | 15 20 | | | | | | |
| May 27 | | $_iP_Z$ | 10 03 42 | | | | | | Sheets off 13 hrs.12m. Quake still recording heavily. |
| | | $i_Z$ | 10 08 10 | | | | | | |
| | | $S_Z$ | 10 14 35 | | | | | | |
| | | $SR_{1Z}$ | 10 20 56 | | | | | | |
| | | $_eL_Z$ | 10 32 45 | | | | | | |
| | | $L_Z$ | 10 39 00 | 27 | | | | | |
| | | $M_{1Z}$ | 10 44 02 | 23 | | | 24.5mm. | | |
| | | $M_{2Z}$ | 10 51 51 | 18 | | | 43.0mm. | | |
| | | $M_{3Z}$ | 10 54 26 | 17 | | | 57.3mm. | | |
| May 28 | | $e_Z$ | 07 01 16 | | | | | | ? |
| | | $i_Z$ | 07 10 26 | | | | | | |
| | | $_eL_Z$ | 07 25 17 | | | | | | |
| | | $M_{1Z}$ | 07 40 43 | 09 | | | 2.3mm. | | |
| | | $M_{2Z}$ | 07 47 14 | 17 | | | 4.8mm. | | |
| | | $M_{3Z}$ | 07 54 01 | 11 | | | 4.0mm. | | |
| | | $F_Z$ | 09 02 | | | | | | |
| May 28 | | $_eL_Z$? | 07 12 05 | | | | | | |
| | | $L_Z$ | 07 17 (ca.) | | | | | | |
| | | $L_Z$ | 07 19 (ca.) | | | | | | Very heavy micros. |
| | | $F_Z$ | 07 42 | | | | | | |
| May 28 | | $e_Z$ | 15 58 37 | | | | | | |
| | | $_eL_Z$ | 16 19 16 | | | | | | ? |
| | | $M_{1Z}$ | 16 34 46 | 16 | | | 3.1mm. | | |
| | | $M_{2Z}$ | 16 37 08 | 9 | | | 3.6mm. | | Gram very difficult. Heavy micros. |
| | | $F_Z$ | 17 28 | | | | | | |
| May 31 | | $e_Z$ | 07 27 10 | | | | | | |
| | | $e_Z$ | 07 34 14 | | | | | | |
| | | $_eL_Z$ | 07 50 35 | | | | | | ? |
| | | $L_Z$ | 08 24 | 18 | | | | | |
| | | $L_Z$ | 08 32 | 14 | | | | | |
| | | $F_Z$ | 09 (ca.) | | | | | | |
| May 31 | | $e_Z$ | 14 16 20 | | | | | | Possibly $_eL$ |
| | | $i_Z$ | 14 18 54 | | | | | | |
| | | $L_Z$ | 14 59 | 15 | | | | | |
| | | $F_Z$ | 15 30 | | | | | | |
| May 31 | | $i_Z$ | 23 43 07 | | | | | | Possibly P |
| | | $i_Z$ | 23 50 22 | | | | | | |
| | | $_eL_Z$ | 23 59 51 | 9 | | | | | |
| | | $F_Z$ | Lost | | | | | | Sheets off at 00 hrs. 28 m. Quake still recording. |

Francis A. Tondorf, S. J.,
Director.

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# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 1 | | $e_Z$ | 12 51 | | | | | | Sheets on at 12hrs.51m. |
| | | $i_Z$ | 13 15 09 | | | | | | Quake then on |
| | | $i_Z$ | 13 21 36 | | | | | | |
| | | $F_Z$ | In following quake | | | | | | Heavy micros. |
| June 1 | | $i P_Z$ | 13 25 31 | | | | | | |
| | | $e S_Z$ | 13 36 17 | | | | | | ? |
| | | $e L_Z$ | 13 55 17 | | | | | | |
| | | $M1_Z$ | 14 06 14 | 13 | | | 4.3mm. | | |
| | | $M2_Z$ | 14 11 16 | 14 | | | 7.3mm. | | |
| | | $M3_Z$ | 14 12 54 | 14 | | | 9.6mm. | | |
| | | $M4_Z$ | 14 21 14 | 15 | | | 7.1mm. | | |
| | | $F_Z$ | 15 50 | | | | | | |
| June 3 | | | | | | | | | Throughout this day the galvanometer was out of order on the Galitzin machine. No quakes on other instruments. |
| June 4 | | $i_Z$ | 02 14 46 | | | | | | |
| | | $i_Z$ | 02 19 51 | | | | | | $S_Z$ possibly. |
| | | $e L_Z$ | 02 29 06 | | | | | | |
| | | $M_Z$ | 02 36 15 | 7 | | | 3.8mm. | | |
| | | $F_Z$ | 02 51 | | | | | | |
| June 5 | | $e_Z$ | 07 01 08 | | | | | | |
| | | $F_Z$ | 07 17 | | | | | | |
| June 6 | | $e_Z$ | 19 47 17 | | | | | | Difficult. |
| | | $L_Z$ | 20 04 13 | 18 | | | | | Possibly sooner. |
| | | $M_Z$ | 20 06 25 | 18 | | | 5.0mm. | | Heavy micros. |
| | | $F_Z$ | 20 47 | | | | | | |
| June 6 | | $e_Z$ | 16 38 03 | | | | | | |
| | | $L_Z$ | 16 40 00 | | | | | | Possibly sooner. |
| | | $L_Z$ | 16 49 57 | | | | | | |
| | | $M_Z$ | 17 07 32 | 8 | | | 2.0mm. | | |
| | | $F_Z$ | 17 15 | | | | | | |
| June 7 | | $e L_Z$ ? | 03 31 02 | | | | | | |
| | | $L_Z$ | 03 31 17 | 12 | | | | | |
| | | $F_Z$ | 03 45 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | Δ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| June 8 | | $_ePZ$ | 14 53 52 | | | | | | |
| | | $_eSZ$ | 15 04 47 | | | | | | S possibly 3 sec. sooner. |
| | | $_eLZ$ | 15 22 40 | | | | | | |
| | | $M1_Z$ | 15 34 40 | 20 | | | 10.0mm. | | |
| | | $M2_Z$ | 15 36 38 | 19 | | | 10.5mm. | | |
| | | $FZ$ | 15 57 | | | | | | |
| June 8 | | $eZ$ | 06 01 25 | | | | | | |
| | | $eZ$ | 06 10 27 | | | | | | |
| | | $iZ$ | 06 12 10 | | | | | | |
| | | $MZ$ | 06 14 35 | 12 | | | 3.2mm. | | |
| | | $FZ$ | 06 40 | | | | | | |
| June 9 | | $ePZ$ | 02 43 26 | | | | | | |
| | | $eSZ$ | 02 48 32 | | | | | | |
| | | $eLZ$ | 02 52 49 | | | | | | |
| | | $M1_Z$ | 02 57 14 | 6 | | | 4.9mm. | | |
| | | $M2_Z$ | 03 00 16 | 18 | | | 10.6mm. | | |
| | | $FZ$ | 03 54 | | | | | | |
| June 9 & 10 | Galvanometer trouble. Any quakes having occurred were in consequence lost. | | | | | | | | |
| June 15 | | $iZ$ | 06 31 40 | | | | | | Difficult. |
| | | $iPR1_Z$ | 06 33 37 | | | | | | |
| | | $iPR2_Z$ | 06 38 08 | | | | | | |
| | | $iSZ$ | 06 45 04 | | | | | | |
| | | $eLZ$ | 07 07 | | | | | | ? |
| | | $M1_Z$ | 07 30 33 | 19 | | | 29.1mm. | | |
| | | $M2_Z$ | 07 32 30 | 18 | | | 30.6mm. | | |
| | | $M3_Z$ | 07 36 13 | 14 | | | 25.8mm. | | |
| | | $FZ$ | 08 57 | | | | | | |
| June 15 | | $iZ$ | 17 37 13 | | | | | | |
| | | $iZ$ | 17 46 52 | | | | | | |
| | | $eLZ$ | 18 09 10 | | | | | | $P_{R1}$ ? |
| | | $M1_Z$ | 18 33 31 | 20 | | | 12.8mm. | | |
| | | $M2_Z$ | 18 37 52 | 17 | | | 19.0mm. | | |
| | | $FZ$ | 20 (ca.) | | | | | | |
| June 17 | | $iPE$ | 03 25 20 | | | | | | |
| | | $iPN$ | 03 25 19 | | | | | | Amplitudes so great as to make all readings difficult especially on Z component. |
| | | $iPZ$ | 03 25 18 | | | | | | |
| | | $iPR1_E$ | 03 26 08 | | | | | | |
| | | $iPP1_N$ | 03 26 08 | | | | | | |
| | | $iSE$ | 03 30 21 | | | | | | |
| | | $eSN$ | 03 30 21 | | | | | | |
| | | $eLE$ | 03 32 26 | | | | | | |
| | | $ME$ | 03 36 58 | 6 | | | 14.6mm. | | |
| | | $FEN$ | 05 30 | | | | | | |
| | | $FZ$ | 10 04 | | | | | | |
| June 17 | | $iPZ$ | 22 27 05 | | | | | | |
| | | $eSZ$ | 22 31 50 | | | | | | ?? |
| | | $MZ$ | 22 39 53 | | | | 5.3mm. | | |
| | | $FZ$ | In following quake | | | | | | |
| June 17 | | $iPZ$ | 23 30 49 | | | | | | |
| | | $SR1_Z$ | 23 37 05 | | | | | | Micros very heavy. |
| | | $M1_Z$ | 23 43 36 | 8 | | | 5.3mm. | | |
| | | $M2_Z$ | 23 46 21 | 12 | | | 16.6mm. | | |
| | | $M3_Z$ | 23 48 24 | 10 | | | 14.6mm. | | |
| | | $FZ$ | 01 (ca.) | | | | | | |

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June 1 to June 30, 1928

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | △ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| June 18 | | $i_Z$ | 15 46 26 | | | | | | Very Heavy micros Difficult. |
| | | $L_Z$ | 16 00 43 | | | | | | |
| | | $M_Z$ | 16 10 16 | 8 | | | 7.2mm. | | |
| | | $F_Z$ | 17 et postea. | | | | | | |
| June 19 | | $e_Z$ | 19 12 33 | | | | | | |
| | | $i_Z$ | 19 15 37 | | | | | | |
| | | $L_Z$ | 19 17 | | | | | | |
| | | $F_Z$ | 19 38 | | | | | | |
| June 21 | | $iP_E$ | 16 35 52 | | | | | | |
| | | $eP_N$ | 16 35 51 | | | | | | |
| | | $iS_E$ | 16 42 46 | | | | | | |
| | | $iS_N$ | 16 42 46 | | | | | | |
| | | $S_{R1_E}$ | 16 45 44 | | | | | | |
| | | $S_{R1_N}$ | 16 45 44 | | | | | | |
| | | $eL_E$ | 16 47 36 | | | | | | |
| | | $eL_N$ | 16 47 36 | | | | | | |
| | | $M_E$ | 16 52 46 | | | 192mm. | | | |
| | | $M_N$ | 16 52 46 | | 9.9mm. | | | | |
| | | $F_{EN}$ | 17 54 | | | | | | |
| June 21 | | $i_Z$ | 04 43 45 | | | | | | $eL_Z$ ? |
| | | $L_Z$ | 04 50 04 | 19 | | | | | Heavy micros. |
| | | $F_Z$ | 05 54 | | | | | | |
| June 21 | | $i_Z$ | 10 56 25 | | | | | | $P_Z$ ? |
| | | $i_Z$ | 10 59 25 | | | | | | $P_{R_1}$ ? |
| | | $eS_Z$ | 11 06 26 | | | | | | |
| | | $i_Z$ | 11 09 32 | | | | | | |
| | | $L_Z$ | 11 32 | 27 | | | | | |
| | | $M_Z$ | 11 36 16 | 21 | | | 27.0mm. | | |
| | | $F$ | Sheets off at 13hrs. 20m. with quake still running heavily. | | | | | | |
| June 21 | | $iP_Z$ | 16 35 53 | | | | | | No other phases can be read because of obliteration of time due to large amplitudes. |
| | | $iS_Z$ | 16 42 52 | | | | | | |
| June 22 | | $i_Z$ | 22 04 45 | | | | | | |
| | | $i_Z$ | 22 11 37 | | | | | | |
| | | $eL_Z$? | 22 19 36 | | | | | | |
| | | $F_Z$ | 22 25 | | | | | | |
| June 23 | | $e_Z$ | 06 24 53 | | | | | | |
| | | $e_Z$ | 06 27 04 | | | | | | $eL_Z$ ? |
| | | $F_Z$ | 06 39 | | | | | | |
| June 23 | | $e_Z$ | 07 02 10 | | | | | | |
| | | $e_Z$ | 07 18 43 | | | | | | |
| | | $e_Z$ | 07 25 22 | | | | | | |
| | | $M1_Z$ | 07 43 23 | 8 | | | 5.4mm. | | |
| | | $M2_Z$ | 07 44 50 | 8 | | | 4.3mm. | | |
| | | $M3_Z$ | 07 46 40 | 8 | | | 4.3mm. | | |
| | | $F_Z$ | 08 20 | | | | | | |
| June 25 | | $i_Z$ | 07 30 57 | | | | | | |
| | | $S_Z$ | 07 39 00 | | | | | | ? |
| | | $eL_Z$ | 07 53 19 | | | | | | |
| | | $M_Z$ | 08 04 47 | | | | 5.0mm. | | |
| | | $F_Z$ | 08 50 | | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS

140 quar. June 1 to June 30, 1928

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | $\Delta$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| June 27 | | $e_Z$ | 00 50 27 | | | | | | |
| | | $e_Z$ | 00 57 24 | | | | | | |
| | | $e_Z$ | 01 06 07 | | | | | | |
| | | $_eL_Z$ | 01 11 03 | | | | | | |
| | | $L_Z$ | 01 17 47 | 8-9 | | | | | |
| | | $M_Z$ | 01 20 50 | 10 | | | 2.2mm. | | |
| | | $F_Z$ | 03 05 | | | | | | |
| June 29 | | $P_Z$ | 23 04 45 | | | | | | |
| | | $P_{R_{1Z}}$ | 23 09 23 | | | | | | |
| | | $i_Z$ | 23 19 34 | | | | | | |
| | | $_eL_Z$ | 23 39 11 | | | | | | |
| | | $M_{1Z}$ | 23 50 44 | 20 | | | 27.0mm. | | |
| | | $M_{2Z}$ | 23 57 00 | 18 | | | | | |
| | | $F_Z$ | 02 58 | | | | | | |
| June 30 | | $e_Z$ | 09 52 17 | | | | | | |
| | | $e_Z$ | 09 53 12 | | | | | | |
| | | $e_Z$ | 10 03 04 | | | | | | $_eL_Z$ ? |
| | | $F_Z$ | 10 12 | | | | | | |
| June 1 | | $e_Z$ | 08 39 06 | | | | | | Very heavy micros. |
| | | $i_Z$ | 08 48 34 | | | | | | |
| | | $L_Z$ | 09 07 36 | 11 | | | | | |
| | | $F_Z$ | 09 10 | | | | | | |

Francis A. Tondorf, S. J.,
Director.

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double

No. 141 *From* July 1 *to* July 31, *19* 28

# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | A | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| July 1 | | $e_Z$ | 09 23 48 | | | | | | |
| | | $e_Z$ | 09 29 44 | | | | | | |
| | | $_eL_Z$ | 09 34 46 | | | | | | |
| | | $L_Z$ | 09 39 49 | | | | | | |
| | | $M_Z$ | 09 45 08 | 11 | | | 9.2mm. | | |
| | | $F_Z$ | 10 40 | | | | | | |
| July 2 | | $e_Z$ | 02 23 38 | | | | | | |
| | | $e_Z$ | 02 25 07 | | | | | | |
| | | $_eL_Z$ | 02 35 14 | | | | | | |
| | | $M_Z$ | 02 39 42 | | | | | | |
| | | $F_Z$ | 03 16 | | | | | | |
| July 2 | | $e_Z$ | 09 40 05 | | | | | | |
| | | $_eL_Z$ | 09 52 26 | | | | | | |
| | | $F_Z$ | 10 55 | | | | | | |
| July 4 | | $i_Z$ | 20 16 30 | | | | | | $P_Z$? |
| | | $i_Z$ | 20 17 11 | | | | | | $P_{R_1}$ |
| | | $S_Z$? | 20 20 29 | | | | | | |
| | | $M_Z$ | 20 26 32 | | | | 2.4mm. | | |
| | | $F_Z$ | 21 10 | | | | | | |
| July 6 | | $M_Z$ | 01 43 00 | 10 | | | 5.0mm. | | |
| | | $F_Z$ | 01 56 | | | | | | |
| July 7 | | $_eP_Z$ | 03 40 07 | | | | | | Sheets dow... at 1hr.3[illegible]m. Early phas-es lost. |
| | | $S_Z$ | 03 44 22 | | | | | | |
| | | $_eL_Z$ | 03 46 34 | | | | | | |
| | | $M_Z$ | 03 55 32 | 10 | | | 13.3mm. | | |
| | | $F_Z$ | 04 45 | | | | | | |
| July 7 | | $e_Z$ | 18 58 16 | | | | | | Heavy micr. |
| | | $F_Z$ | 19 11 | | | | | | |
| July 8 | | $iP_Z$ | 12 02 11 | | | | | | |
| | | $_eS_Z$ | 12 07 18 | | | | | | |
| | | $_eL_Z$ | 12 10 10 | | | | | | |
| | | $L_Z$ | 12 17 12 | 12 | | | | | |
| | | $M1_Z$ | 12 18 35 | 15 | | | 4.3mm. | | |
| | | $M2_Z$ | 12 24 37 | 11 | | | 3.7mm. | | |
| | | $F_Z$ | 12 56 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | $A_E$ | $A_Z$ | $\Delta$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| July 9 | | $e_Z$ | 21 26 42 | | | | | | |
| | | $e_Z$ | 21 34 28 | | | | | | |
| | | $i_Z$ | 21 43 55 | | | | | | |
| | | $i_Z$ | 21 53 54 | | | | | | |
| | | $e_{L_Z}$ | 22 18 33 | | | | | | |
| | | $L_Z$ | 22 22 05 | | | | | | ? |
| | | $M1_Z$ | 22 25 35 | 25 | | | 13.0mm. | | |
| | | $M2_Z$ | 22 26 50 | 23 | | | 17.0mm. | | |
| | | $M3_Z$ | 22 31 19 | 19-20 | | | 20.0mm. | | |
| | | $M4_Z$ | 22 33 29 | 18 | | | 26.5mm. | | |
| | | $F_Z$ | 01 (ca.) | | | | | | |
| July 10 | | $iP_Z$ | 02 08 40 | | | | | | |
| | | $PR1_Z$ | 02 09 20 | | | | | | |
| | | $S_Z$ | 02 13 35 | | | | | | |
| | | $e_{L_Z}$ | 02 14 55 | | | | | | |
| | | $M1_Z$ | 02 21 34 | 21 | | | 8.0mm. | | |
| | | $M2_Z$ | 02 24 29 | 16 | | | 11.0mm. | | |
| | | $M3_Z$ | 02 25 31 | 15 | | | 15.7mm. | | |
| | | $M4_Z$ | 02 26 46' | 15 | | | 14.5mm. | | |
| | | $F_Z$ | 03 44 | | | | | | |
| July 10 | | $e_Z$ | 10 04 40 | | | | | | |
| | | $e_Z$ | 10 10 24 | | | | | | |
| | | $i_Z$ | 10 16 27 | | | | | | |
| | | $e_Z$ | 10 28 45 | | | | | | |
| | | $e_{L_Z}$ | 10 35 23 | | | | | | |
| | | $M_Z$ | 10 45 44 | 11 | | | 2.7mm. | | |
| | | $F_Z$ | 12 (ca.) | | | | | | |
| July 11 | | $e_Z$ | 03 10 44 | | | | | | |
| | | $e_Z$ | 03 18 07 | | | | | | |
| | | $e_Z$ | 03 20 43 | | | | | | |
| | | $e_Z$ | 03 33 09 | | | | | | |
| | | $e_{L_Z}$ | 03 51 15 | | | | | | |
| | | $L_Z$ | 03 56 10 | 31 | | | | | $e_{L_Z}$ possibly |
| | | $M1_Z$ | 03 57 25 | 18 | | | 2.8mm. | | much sooner. |
| | | $M2_Z$ | 04 03 30 | 16 | | | 3.3mm. | | |
| | | $M3_Z$ | 04 05 39 | 18 | | | 3.4mm. | | |
| | | $M4_Z$ | 04 12 57 | 16 | | | 3.2mm. | | |
| | | $F_Z$ | 05 30 (ca.) | | | | | | |
| July 12 | | $e_Z$ | 01 32 33 | | | | | | |
| | | $L_Z$ | 01 34 56 | 7-8 | | | | | Very difficult |
| | | $F_Z$ | 02 20 | | | | | | |
| July 13 | | $e_Z$ | 09 45 36 | | | | | | |
| | | $e_Z$ | 10 00 14 | | | | | | |
| | | $e_Z$ | 10 05 46 | | | | | | |
| | | $e_Z$ | 10 16 50 | | | | | | |
| | | $L_Z$ | 10 25 14 | 19 | | | | | |
| | | $M_Z$ | 10 30 31 | 14-15 | | | 2.4mm. | | |
| | | $F_Z$ | 12 (ca.) | | | | | | |
| July 13 | | $L_Z$ | 20 55 to 21 02 | 21 | | | | | $e_Z$ ? 20hrs. 45m. Heavy Micros. |
| July 15 | | $e_Z$ | 09 56 20 | | | | | | |
| | | $e_{L_Z}$ | 10 14 | | | | | | |
| | | $F_Z$ | 10 48 | | | | | | |
| July 15 | | $e_Z$ | 13 57 45 | | | | | | |
| | | $e_{L_Z}$ ? | 14 36 37 | | | | | | |
| | | $L_Z$ | 14 41 12 | | | | | | |
| | | $M_Z$ | 14 46 46 | | | | | | |
| | | $F_Z$ | 14 55 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | AMPLITUDE $\Delta$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| July 18 | | $P_Z$ | 19 13 15 | | | | | | |
| | | $P_{R_1}Z$ | 19 15 05 | | | | | | |
| | | $P_{R_2}Z$ | 19 15 39 | | | | | | |
| | | $S_Z$ | 19 20 08 | | | | | | |
| | | $S_{R_1}Z$ | 19 23 32 | | | | | | |
| | | $S_{R_2}Z$ | 19 24 29 | | | | | | |
| | | $_eL_Z$? | 19 27 21 | | | | | | |
| | | $M_1Z$ | 19 31 59 | 13 | | | 93.0mm. | | |
| | | $M_2Z$ | 19 33 30 | 17 | | | 107.8mm. | | |
| | | $M_3Z$ | 19 36 17 | 16 | | | 106.0mm. | | |
| | | $M_4Z$ | 19 38 59 | 14 | | | 75.0mm. | | |
| | | $M_5Z$ | 19 40 26 | 15 | | | 73.6mm. | | |
| | | $F_Z$ | 23 30 (ca.) | | | | | | |
| July 19 | | $e_Z$ | 06 04 00 | | | | | | |
| | | $e_Z$ | 06 07 32 | | | | | | |
| | | $F_Z$ | 06 20 | | | | | | |
| July 19 | | $e_Z$ | 23 59 50 | | | | | | |
| | | $i_Z$ | 00 10 10 | | | | | | |
| | | $_eL_Z$ | 00 32 10 | 10 | | | | | |
| | | $F_Z$ | 01 53 | | | | | | |
| July 21 | | $e_Z$ | 02 28 07 | | | | | | |
| | | $P_{R_1}Z$ | 02 31 04 | | | | | | |
| | | $S_Z$? | 02 36 41 | | | | | | |
| | | $M_Z$ | 02 59 51 | 7 | | | 2.7mm. | | |
| | | $F_Z$ | 04 (et postea) | | | | | | |
| July 21 | | $e_Z$ | 06 07 57 | | | | | | |
| | | $_eL_Z$ | 06 52 18 | | | | | | |
| | | $F_Z$ | 07 10 | | | | | | |
| July 22 | | $P_Z$ | 07 34 17 | | | | | | |
| | | $S_Z$ | 07 39 51 | | | | | | |
| | | $_eL_Z$ | 07 43 40 | | | | | | |
| | | $L_Z$ | 07 47 27 | | | | | | |
| | | $M_1Z$ | 07 50 09 | 11 | | | 6.0mm. | | |
| | | $M_2Z$ | 07 52 28 | 11 | | | 7.1mm. | | |
| | | $F_Z$ | 09 (ca.) | | | | | | |
| July 23 | | $P_Z$? | 08 03 05 | | | | | | |
| | | $e_Z$ | 08 06 32 | | | | | | |
| | | $e_Z$ | 08 08 15 | | | | | | |
| | | $e_Z$ | 08 14 07 | | | | | | |
| | | $e_Z$ | 08 16 24 | | | | | | |
| | | $e_Z$ | 08 17 32 | | | | | | |
| | | $_eL_Z$? | 08 34 42 | | | | | | |
| | | $L_Z$ | 08 53 08 | | | | | | |
| | | $M_Z$ | 09 00 38 | | | | | 1.9mm | |
| | | $M_1Z$ | 09 02 48 | | | | | 1.5mm. | |
| | | $F_Z$ | 10 05 | | | | | | |
| July 23 | | $e_Z$ | 15 35 00 | | | | | | |
| | | $_eL_Z$? | 15 40 04 | 9 | | | | | |
| | | $L_Z$ | 15 45 49 | 19 | | | | | |
| | | $M_1Z$ | 15 46 45 | 15 | | | 4.0mm. | | |
| | | $M_2Z$ | 15 48 46 | 9 | | | 4.0mm. | | |
| | | $F_Z$ | 16 28 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_H$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | $\Delta$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| July 25 | | $e_Z$ | 06 50 29 | | | | | | Possibly sooner at 6hrs.46m. |
| | | $L_Z$ | 06 20 33 | 11 | | | | | |
| | | $M_Z$ | 06 21 41 | 11 | | | 5.0mm. | | |
| | | $F_Z$ | 06 26 | | | | | | |
| July 25 | | $e_Z$ | 18 54 25 | | | | | | Difficult. |
| | | $_eL_Z$ | 19 03 36 | | | | | | |
| | | $L_Z$ | 19 08 40 | 14 | | | | | |
| | | $M_Z$ | 19 09 58 | 12 | | | 4.2mm. | | |
| | | $F_Z$ | 20 12 | | | | | | |
| July 26 | | $e_Z$ | 00 49 09 | | | | | | |
| | | $F_Z$ | 01 56 | | | | | | |
| July 27 | | $e_Z$ | 16 36 21 | | | | | | |
| | | $_eL_Z$? | 16 41 37 | | | | | | |
| | | $L_Z$ | 16 46 12 | | | | | | |
| | | $F_Z$ | 17 14 | | | | | | |
| July 28 | | $e_Z$ | 02 37 10 | | | | | | |
| | | $L_Z$ | 02 42 14 | 12-13 | | | | | |
| | | $F_Z$ | 02 55 | | | | | | |
| July 28 | | $L_Z$ | 07 26 19 | 19 | | | | | |
| | | $F_Z$ | 07 43 | | | | | | |
| July 28 | | $e_Z$ | 19 55 28 | | | | | | e possibly sooner. |
| | | $iS_Z$? | 20 01 28 | | | | | | |
| | | $_eL_Z$? | 20 10 36 | | | | | | |
| | | $L_Z$ | 20 20 00 | 11 | | | | | |
| | | $i_Z$ | 20 29 34 | | | | | | May be in other quake. |
| | | $F_Z$ | 20 59 | | | | | | |
| July 30 | | $e_Z$ | 02 37 15 | | | | | | |
| | | $i_Z$ | 02 49 53 | | | | | | |
| | | $i_Z$ | 02 51 03 | | | | | | |
| | | $_eL_Z$ | 02 53 06 | 7 | | | | | |
| | | $M_Z$ | 03 02 13 | 18 | | | 19.6mm. | | |
| | | $F_Z$ | 04 15 | | | | | | |
| July 30 | | $e_Z$ | 07 20 34 | | | | | | |
| | | $_eL_Z$ | 07 25 11 | 17 | | | | | |
| | | $F_Z$ | 07 37 | | | | | | |

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# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | A | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.7 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Aug. 1 | | $e_Z$ | 01 09 46 | | | | | | |
| | | $L_Z$ | 01 12 14 | | | | | | |
| | | $F_Z$ | 01 14 | | | | | | |
| Aug. 1 | | $e_Z$? | 08 04 40 | | | | | | |
| | | $L_Z$ | 08 08 35 | 8 | | | | | |
| | | $F_Z$ | 08 15 | | | | | | |
| Aug. 1 | | $e_Z$ | 09 07 36 | | | | | | |
| | | $L_Z$ | 09 08 19 | 12 | | | | | |
| | | $F_Z$ | 09 14 | | | | | | |
| Aug. 2 | | $e_{P_Z}$? | 06 51 44 | | | | | | |
| | | $e_{L_Z}$ | 07 06 09 | | | | | | |
| | | $L_Z$ | 07 08 44 | 14 | | | | | |
| | | $M_Z$ | 07 10 19 | 11 | | | 6.5mm. | | |
| | | $F_Z$ | 08 (ca.) | | | | | | |
| Aug. 3 | | $P_Z$ | 11 56 02 | | | | | | |
| | | $S_Z$? | 12 03 26 | | | | | | |
| | | $e_{L_Z}$ | 12 13 22 | | | | | | |
| | | $L_Z$ | 12 19 09 | 13 | | | | | |
| | | $M_Z$ | 12 22 38 | 16 | | | 5.3mm. | | |
| | | $F_Z$ | 13 05 | | | | | | |
| Aug. 4 | | $P_E$ | 18 32 19 | | | | | | |
| | | $P_N$ | 18 32 19 | | | | | | |
| | | $P_Z$ | 18 32 17 | | | | | | |
| | | $P_{R_{1E}}$ | 18 33 05 | | | | | | |
| | | $P_{R_{1N}}$ | 18 33 04 | | | | | | |
| | | $P_{R_{2E}}$ | 18 33 28 | | | | | | |
| | | $P_{R_{2N}}$ | 18 33 29 | | | | | | |
| | | $S_E$ | 18 37 23 | | | | | | |
| | | $S_N$ | 18 37 23 | | | | | | |
| | | $e_{L_E}$ | 18 39 23 | | | | | | |
| | | $e_{L_N}$ | 18 39 24 | | | | | | |
| | | $M_{1E}$ | 18 45 36 | | | | 7.1mm. | | |
| | | $M_{1N}$ | 18 39 34 | | 6.5mm. | | | | |
| | | $M_{2E}$ | 18 48 14 | | | | 5.4mm. | | |
| | | $M_{2N}$ | 18 49 08 | 11 | 4.3mm. | | | | |
| | | $M_{3E}$ | 18 55 43 | 9 | | | 4.6mm. | | |
| | | $M_{3N}$ | 18 55 08 | 12 | 5.5mm. | | | | |
| | | $F_E$ | 20 05 | | | | | | |
| | | $F_N$ | 20 05 | | | | | | |
| | | $F_Z$ | 22 40 | | | | | | |
| Aug. 5 | | $e_Z$ | 14 49 46 | | | | | | |
| | | $i_Z$ | 15 02 29 | | | | | | |
| | | $e_{L_Z}$? | 15 34 19 | 9 | | | | | |
| | | $L_Z$ | 15 55 15 | 17 | | | | | |
| | | $F_Z$ | 16 41 | | | | | | No distinct M. |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Aug. 8 | | $iP_Z$? | 02 34 51 | | | | | Possibly P' |
| | | $i_Z$ | 02 38 10 | | | | | |
| | | $eL_Z$? | 03 28 40 | | | | | |
| | | $L_Z$ | 03 35 01 | 14 | | | | |
| | | $M_Z$ | 03 38 41 | | | | 2.0mm. | |
| | | $F_Z$ | 04 (ca.) | | | | | |
| Aug. 9 | | $e_Z$ | 05 35 30 | | | | | |
| | | $e_Z$ | 05 49 13 | | | | | |
| | | $eL_Z$ | 06 15 38 | | | | | |
| | | $F_Z$ | 07 (ca.) | | | | | |
| Aug. 10 | | $e_Z$ | 15 53 19 | | | | | Possibly sooner. |
| | | $e_Z$ | 15 57 35 | | | | | |
| | | $eL_Z$? | 16 19 17 | | | | | |
| | | $F_Z$ | 17 30 (ca.) | | | | | |
| Aug. 12 | | $i_Z$ | 08 27 54 | | | | | P possibly. |
| | | $i_Z$ | 08 30 50 | | | | | $P_{R_1}$? |
| | | $i_Z$ | 08 43 08 | | | | | |
| | | $eL_Z$? | 09 13 09 | | | | | |
| | | $M_Z$ | 09 28 13 | | | | | |
| | | $F_Z$ | 10 55 | | | | | |
| Aug. 15 | | $e_Z$ | 15 45 03 | | | | | |
| | | $L_Z$ | 15 53 14 | 29 | | | | |
| | | $M_Z$ | 15 55 14 | 19 | | | 5.3mm. | |
| | | $F_Z$ | 16 51 | | | | | |
| Aug. 15 | | $iP_Z$ | 17 25 48 | | | | | |
| | | $eP_E$ | 17 25 46 | | | | | |
| | | $iP_N$ | 17 25 47 | | | | | |
| | | $iS_Z$ | 17 34 04 | | | | | |
| | | $iS_E$ | 17 34 05 | | | | | |
| | | $iS_N$ | 17 34 05 | | | | | |
| | | $eL_Z$ | 17 42 07 | 12 | | | | |
| | | $M1_Z$ | 17 51 26 | 13 | | | 3.7mm. | |
| | | $M2_Z$ | 17 53 23 | 17 | | | 4.0mm. | |
| | | $F_Z$ | 19 (ca.) | | | | | |
| Aug. 16 | | $e_Z$ | 08 10 04 | | | | | Possibly $eL_Z$ |
| | | $L_Z$ | 08 18 25 | 20? | | | | |
| | | $F_Z$ | 08 35 | | | | | |
| Aug. 18 | | | | | | | | Light cut off from 17th day at 19hrs.7ms. to 18th day at 1hr.25ms. |
| | | $e_Z$ | 05 43 11 | | | | | |
| | | $e_Z$ | 05 50 41 | | | | | |
| | | $e_Z$ | 05 59 58 | | | | | |
| | | $eL_Z$ | 06 25 16 | | | | | |
| | | $L_Z$ | 06 29 24 | 18 | | | | No distinct M. |
| | | $F_Z$ | 07 25 (ca.) | | | | | |
| Aug. 19 | | $e_Z$ | 03 04 42 | | | | | |
| | | $eL_Z$ | 03 10 00 | | | | | |
| | | $F_Z$ | 03 35 | | | | | |
| Aug. 20 | | $e_Z$ | 02 41 50 | | | | | |
| | | $eL_Z$ | 02 57 | | | | | |
| | | $F_Z$ | 03 15 | | | | | |
| Aug. 20 | | $P_Z$ | 17 54 02 | | | | | |
| | | $P_{R_1Z}$ | 17 55 43 | | | | | |
| | | $P_{R_3Z}$ | 17 56 33 | | | | | |
| | | $S_Z$ | 18 00 36 | | | | | |
| | | $S_{R_1Z}$ | 18 03 37 | | | | | |
| | | $eL_Z$ | 18 06 41 | | | | | |
| | | $L_Z$ | 18 09 24 | 11 | | | | |
| | | $M1_Z$ | 18 14 30 | 11 | | | 2.6mm. | |
| | | $M2_Z$ | 18 17 19 | 11 | | | 3.2mm. | |
| | | $F_Z$ | 19 10 | | | | | |
| Aug. 22 | | $eL_Z$ | 06 54 59 | | | | | |
| | | $L_Z$ | 06 58 09 | 16 | | | | |
| | | $M_Z$ | 06 59 21 | 20 | | | 2.0mm. | |
| | | $F_Z$ | 07 10 | | | | | |
| Aug. 22 | | $e_Z$ | 20 22 14 | | | | | |
| | | $L_Z$ | 20 36 54 | 13 | | | | Difficult. Possibly at 20hrs.20ms. |
| | | $F_Z$ | 20 51 | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Aug. 23 | | $e_Z$ | 04 23 29 | | | | | |
| | | $e_Z$ | 04 51 22 | | | | | |
| | | $L_Z$ | 05 00 29 | 8 | | | | $e L_Z$? |
| | | $F_Z$ | 05 02 | | | | | |
| Aug. 24 | | $e_Z$ | 02 17 09 | | | | | Absolute time uncertain by several seconds. |
| | | $F_Z$ | 02 32 | | | | | |
| Aug. 24 | | $e_Z$ | 09 54 24 | | | | | |
| | | $e L_Z$ | 10 14 12 | 14 | | | | |
| | | $L_Z$ | 10 15 38 | 20± | | | | No distinct M. |
| | | $F_Z$ | 10 53 (ca.) | | | | | |
| Aug. 24 | | $P_Z$ | 22 02 06 | | | | | P'? |
| | | $i_Z$ | 22 03 21 | | | | | |
| | | $i_Z$ | 22 04 04 | | | | | |
| | | $S_Z$? | 22 12 43 | | | | | |
| | | $i_Z$ | 22 16 18 | | | | | |
| | | $i_Z$ | 22 16 56 | | | | | |
| | | $e L_Z$? | 22 29 34 | | | | | |
| | | $M_{1Z}$ | 22 46 43 | 18-20 | | | 5.0mm. | |
| | | $M_{2Z}$ | 22 52 09 | 18 | | | 4.4mm. | |
| | | $M_{3Z}$ | 22 58 43 | 15-16 | | | 5.0mm. | |
| | | $F_Z$ | 24 25 | | | | | |
| Aug 25 | | $e L_Z$? | 00 23 20 | | | | | The earlier part of this quake is included in the cauda of last quake. |
| | | $M_{1Z}$ | 00 28 07 | 16 | | | 2.9mm. | |
| | | $M_{2Z}$ | 00 39 16 | 16 | | | 2.9mm. | |
| | | $F_Z$ | 01 35 | | | | | |
| | | $e_Z$ | 20 52 25 | | | | | |
| | | $e_Z$ | 20 54 10 | | | | | |
| | | $i_Z$ | 20 58 22 | | | | | $S_Z$? |
| | | $e L_Z$? | 21 04 13 | 15 | | | | |
| | | $F_Z$ | 21 25 | | | | | |
| Aug. 26 | | $e_Z$? | 04 15 19 | | | | | |
| | | $e_Z$ | 04 32 05 | | | | | |
| | | $e L_Z$? | 04 55 07 | | | | | |
| | | $M_Z$ | 05 06 17 | 13 | | | 1.8mm. | |
| | | $M_{2Z}$ | 05 09 15 | | | | 1.6mm. | |
| | | $L_Z$ | 06 01 16 | 11 | | | | Probably another quake. |
| | | $F_Z$ | 06 55 (ca.) | | | | | |
| Aug. 28 | | $e L_Z$? | 09 31 53 | | | | | |
| | | $L_Z$ | 09 40 52 | 16 | | | | |
| | | $L_Z$ | 09 49 59 | 14 | | | | |
| | | $F_Z$ | 10 05 (ca.) | | | | | |
| Aug. 29 | | $e L_Z$ | 03 30 28 | | | | | |
| | | $L_Z$ | 03 35 53 | 16 | | | | |
| | | $M_{1Z}$ | 03 37 21 | 15 | | | 1.9mm. | |
| | | $M_{2Z}$ | 03 45 20 | 14 | | | 1.5mm. | |
| | | $F_Z$ | 04 15 | | | | | |
| Aug. 29 | | $e_Z$ | 07 40 29 | | | | | Gram very difficult of interpretation. |
| | | $e_Z$ | 07 44 19 | | | | | |
| | | $e L_Z$? | 07 46 26 | | | | | |
| | | $F_Z$ | 08 10 | | | | | |
| Aug. 29 | | $e_Z$ | 10 08 39 | | | | | |
| | | $e_Z$ | 10 13 12 | | | | | |
| | | $e_Z$ | 10 16 13 | | | | | |
| | | $L_Z$ | 10 20 16 | 18 | | | | |
| | | $M_Z$ | 10 21 33 | 11 | | | 2.5mm. | |
| | | $F_Z$ | 10 45 | | | | | |
| Aug. 30 | | $e_Z$ | 22 13 05 | | | | | |
| | | $e L_Z$ | 22 17 42 | | | | | |
| | | $L_Z$ | 22 19 00 | 11 | | | | |
| | | $M_Z$ | 22 20 20 | 10 | | | 10.5mm. | |
| | | $F_Z$ | 22 38 | | | | | |
| Aug. 31 | | $e_Z$ | 05 30 27 | | | | | |
| | | $e L_Z$ | 05 42 31 | | | | | |
| | | $F_Z$ | 06 (ca.) | | | | | |
| Aug. 31 | | $e L_Z$ | 10 12 20 | | | | | |
| | | $M_Z$ | 10 13 39 | 13 | | | 2.0mm. | |
| | | $F_Z$ | 10 20 | | | | | |
| Aug. 31 | | $e L_Z$ | 11 07 32 | | | | | |
| | | $M_Z$ | 11 09 52 | 9 | | | 2.4mm. | |
| | | $F_Z$ | 11 20 | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS

No. 19 *From* Sept. 1 *to* Sept. 30, *19* 28

# Washington, D. C.

## Seismological Bulletin

### of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | A | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 1 | | eZ | 06 23 30 | | | | | | |
| | | eZ | 06 27 50 | | | | | | |
| | | iZ | 06 37 13 | | | | | | |
| | | eLZ | 06 50 46 | | | | | | |
| | | $M_1Z$ | 07 11 44 | 16 | | | 8.6mm. | | |
| | | $M_2Z$ | 07 14 12 | 18 | | | 11.0mm. | | |
| | | $M_3Z$ | 07 16 50 | 14 | | | 8.3mm. | | |
| | | $M_4Z$ | 07 18 14 | 14 | | | 9.0mm. | | |
| | | FZ | 08 21 | | | | | | |
| Sept. 2 | | ePZ | 00 00 00 | | | | | | |
| | | eSZ | 00 04 38 | | | | | | |
| | | $S_{R_1}Z$ | 00 05 43 | | | | | | |
| | | eLZ | 00 06 25 | | | | | | |
| | | $M_1Z$ | 00 12 35 | 18 | | | 10+mm. | | Off scale. |
| | | $M_2Z$ | 00 13 20 | 10-11 | | | 25+mm. | | Off sheet. |
| | | $M_3Z$ | 00 14 06 | 9 | | | 27+mm. | | |
| | | FZ | In next quake | | | | | | |
| Sept. 2 | | eZ | 01 42 | | | | | | |
| | | FZ | 02 05 | | | | | | |
| Sept. 2 | | eZ | 24 47 | | | | | | |
| | | eLZ | 17 53 40 | | | | | | |
| | | LZ | 17 54 13 | 18 | | | | | |
| | | FZ | 18 43 | | | | | | |
| Sept. 3 | | eZ | 04 19 04 | | | | | | |
| | | eLZ | 04 21 09 | | | | | | |
| | | FZ | 04 30 | | | | | | |
| Sept. 3 | | eZ | 05 55 41 | | | | | | |
| | | eLZ? | 05 58 42 | | | | | | |
| | | LZ | 05 59 28 | 8 | | | | | |
| | | LZ | 06 09 24 | 8 | | | | | No distinct M. |
| | | FZ | 06 50 | | | | | | |
| Sept. 5 | | eLZ | 05 48 34 | | | | | | |
| | | LZ | 05 50 00 | 9 | | | | | |
| | | $M_1Z$ | 05 50 45 | 5 | | | 2.9mm. | | |
| | | $M_2Z$ | 05 53 45 | 9 | | | 3.1mm. | | |
| | | FZ | 06 11 | | | | | | |
| Sept. 5 | | PZ? | 14 48 12 | | | | | | |
| | | SZ? | 14 50 45 | | | | | | |
| | | $S_{R_1}$? | 14 55 35 | | | | | | |
| | | LZ | 14 59 16 | 4 | | | | | |
| | | MZ | 15 02 50 | 6 | | | 5.5mm. | | |
| | | FZ | 15 25 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | AMPLITUDE ◿ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 6 | | $e_Z$ | 07 28 | | | | | | Masked in very heavy micros. |
| | | $F_Z$ | 07 57 | | | | | | |
| Sept. 6 | | $e_Z$ | 09 53 | | | | | | Possibly sooner. |
| | | $F_Z$ | 10 07 | | | | | | Very heavy micros. May not be seismic. |
| Sept. 7 | | $e_Z$? | 03 08 25 | | | | | | Difficult. Very heavy micros. $P_R$? |
| | | $i_Z$ | 03 13 02 | | | | | | |
| | | $e_Z$ | 03 20 57 | | | | | | |
| | | $e_Z$ | 03 32 20 | | | | | | |
| | | $e_{L_Z}$ | 03 55 11 | | | | | | |
| | | $M_Z$ | 04 05 12 | 15 | | | 5.0mm. | | |
| | | $F_Z$ | In next quake. | | | | | | |
| | | $e_Z$ | 04 29 32 | | | | | | |
| Sept. 7 | | $e_Z$ | 04 33 46 | | | | | | |
| | | $e_{L_Z}$ | 04 44 02 | | | | | | |
| | | $M_Z$ | 04 52 26 | 17-18 | | | 3.0mm. | | |
| | | $F_Z$ | 05 32 | | | | | | |
| Sept. 9 | | $e_{L_Z}$ | 02 44 39 | | | | | | |
| | | $L_Z$ | 02 48 24 | 9 | | | | | |
| | | $M_Z$ | 02 51 47 | 9 | | | 2.2mm. | | |
| | | $F_Z$ | 03 15 | | | | | | |
| Sept. 9 | | $L_Z$ | 12 13 to 12 23 | | | | | | Periods irregular. |
| Sept. 11 | | $e_Z$ | 01 22 17 | | | | | | |
| | | $e_{L_Z}$? | 01 43 24 | | | | | | |
| | | $L_Z$ | 01 48 16 | 8 | | | | | No distinct M. |
| | | $L_Z$ | 02 03 23 | 17 | | | | | |
| | | $F_Z$ | 02 20 | | | | | | |
| Sept. 11 | | $P_Z$? | 12 37 06 | | | | | | There appears to be no little ambiguity in the reports of several Observatories on this quake. Possibly the ambiguity is to be found in the overlapping of two quakes. |
| | | $P_{R_{1Z}}$? | 12 39 47 | | | | | | |
| | | $P_{R_{3Z}}$? | 12 41 03 | | | | | | |
| | | $i_Z$ | 12 43 55 | | | | | | |
| | | $S_Z$? | 12 44 47 | | | | | | |
| | | $PS_Z$? | 12 45 16 | | | | | | |
| | | $e_{L_Z}$ | 12 52 31 | | | | | | |
| | | $M_Z$ | 13 01 24 | 9 | | | 88.5+mm. | | Off of sheet. |
| | | $F_Z$ | 15 50 | | | | | | |
| Sept. 12 | | $e_Z$ | 01 39 25 | | | | | | P'? |
| | | $e_Z$ | 01 41 31 | | | | | | |
| | | $e_Z$ | 01 48 32 | | | | | | |
| | | $e_Z$ | 01 51 46 | | | | | | |
| | | $e_{L_Z}$ | 02 07 24 | 9 | | | | | No distinct M. |
| | | $L_Z$ | 02 16 18 | 14 | | | | | |
| | | $L_Z$ | 02 23 11 | 11 | | | | | |
| | | $F_Z$ | 03 07 | | | | | | |
| Sept. 13 | | P'$_Z$ | 03 45 10 | | | | | | |
| | | $P_{R_{1Z}}$ | 03 48 25 | | | | | | |
| | | $P_{R_{2Z}}$ | 03 51 37 | | | | | | |
| | | $i_Z$ | 03 58 52 | | | | | | |
| | | $i_Z$ | 04 00 20 | | | | | | |
| | | $L_Z$ | 04 33 15 | | | | | | |
| | | $M_{1Z}$ | 04 37 26 | 23 | | | 4.5mm. | | |
| | | $M_{2Z}$ | 04 41 21 | 23 | | | 4.8mm. | | |
| | | $M_{3Z}$ | 04 43 44 | 21 | | | 5.5mm. | | |
| | | $F_Z$ | 05 45 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | AMPLITUDE ∠ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 14 | | eZ | 07 53 09 | | | | | | |
| | | eLZ | 08 09 38 | 9 | | | | | |
| | | MZ | 08 19 51 | 15 | | | 4.6mm. | | |
| | | FZ | 09 (ca.) | | | | | | |
| Sept. 18 | | eZ | 17 33 | | | | | | Very difficult |
| | | eZ | 17 40 09 | | | | | | Very heavy micros of amplitudes approximately 9mm. at times. |
| | | eLZ? | 17 47 49 | 9 | | | | | |
| | | FZ? | | | | | | | |
| Sept. 19 | | LZ | 03 05 19 | 8 | | | | | Very heavy micros. |
| | | FZ | 03 08 | | | | | | |
| Sept. 21 | | eZ | 13 28 43 | | | | | | |
| | | iZ | 13 36 12 | | | | | | |
| | | eLZ | 13 43 14 | 8-9 | | | | | |
| | | MZ | 13 53 44 | 15 | | | 1.7mm. | | |
| | | FZ | 14 25 (ca.) | | | | | | |
| Sept. 22 | | LZ | 06 47 56 | | | | | | |
| | | M1Z | 06 51 29 | 21 | | | 2.5mm. | | |
| | | M2Z | 07 01 59 | | | | 2.0mm. | | |
| | | FZ | In next quake | | | | | | |
| Sept. 22 | | iZ | 07 51 29 | | | | | | P'? |
| | | iZ | 08 01 25 | | | | | | Some phase in S? Possibly PS. |
| | | iZ | 08 03 04 | | | | | | |
| | | iZ | 08 08 28 | | | | | | |
| | | eLZ | 08 16 57 | 19 | | | | | |
| | | LZ | 08 30 03 | 23 | | | | | |
| | | MZ | 08 36 03 | 19 | | | 120.0mm. | | |
| | | FZ | 11 (ca.) | | | | | | |
| Sept. 22 | | eZ | 22 13 18 | | | | | | |
| | | eZ | 22 35 30 | | | | | | |
| | | eLZ | 22 46 57 | | | | | | |
| | | LZ | 22 49 54 | 13 | | | | | |
| | | FZ | 23 20 (et postea). | | | | | | |
| Sept. 23 | | ePZ? | 13 43 02 | | | | | | |
| | | SZ | 13 48 59 | | | | | | |
| | | eLZ | 13 52 52 | 9 | | | | | |
| | | LZ | 13 55 46 | 6 | | | | | |
| | | M1Z | 14 00 18 | 13 | | | 8.8mm. | | |
| | | M2Z | 14 01 19 | 10 | | | 11.0mm. | | |
| | | FZ | 15 10 | | | | | | |
| Sept. 23 | | LZ | 17 52 to 18 01 | | | | | | |
| Sept. 24 | | eZ | 01 54 | | | | | | Difficult. |
| | | FZ | 02 05 | | | | | | Very heavy micros masking gram. |
| Sept. 25 | | eZ? | 08 04 22 | | | | | | Difficult. |
| | | eZ | 08 08 24 | | | | | | |
| | | iZ | 08 15 10 | | | | | | |
| | | eLZ | 08 45 24 | | | | | | No distinct M. |
| | | LZ | 08 51 39 | 10 | | | | | |
| | | LZ | 09 05 08 | 13 | | | | | |
| | | F | Lost in micros. | | | | | | |
| Sept. 27 | | PZ | 00 50 10 | | | | | | Heavy micros. |
| | | PR1Z | 00 50 53 | | | | | | |
| | | iZ | 00 52 09 | | | | | | |
| | | SZ | 00 55 23 | | | | | | |
| | | eLZ | 00 59 09 | 20 | | | | | Possibly sooner. |
| | | MZ | 01 03 12 | 19 | | | 16.0mm. | | |
| | | FZ | 02 20 (ca.) | | | | | | |

Francis A. Tondorf, S. J., Director:

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International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 2 | | $S_Z$? | 19 17 22 | | | | | | |
| | | $_eL_Z$ | 19 20 36 | | | | | | |
| | | $F_Z$ | 19 40 (ca.) | | | | | | |
| Oct. 4 | | $e_Z$ | 18 41 15 | | | | | | |
| | | $e_Z$ | 18 47 27 | | | | | | |
| | | $e_Z$ | 18 52 03 | | | | | | |
| | | $_eL_Z$? | 19 12 06 | | | | | | |
| | | $L_Z$ | 19 15 14 | | | | | | |
| | | $M_{1Z}$ | 19 18 44 | 22 | | | 3.4mm. | | |
| | | $M_{2Z}$ | 19 22 37 | 20 | | | 3.5mm. | | |
| | | $M_{3Z}$ | 19 28 49 | 18 | | | 3.9mm. | | |
| | | $M_{4Z}$ | 19 37 33 | 14 | | | 3.1mm. | | |
| | | $F_Z$ | 20 15 (ca.) | | | | | | |
| Oct. 7 | | $e_Z$ | 11 14 01 | | | | | | Heavy micros. |
| | | $L_Z$ | 11 17 00 | | | | | | |
| | | $F_Z$ | 11 27 | | | | | | |
| Oct. 8 | | $e_Z$ | 01 44 42 | | | | | | |
| | | $L_Z$ | 01 45 31 | | | | | | |
| | | $F_Z$ | 01 50 | | | | | | |
| Oct. 8 | | $e_Z$ | 02 45 35 | | | | | | |
| | | $_eL_Z$ | 02 46 15 | | | | | | |
| | | $F_Z$ | 02 51 | | | | | | |
| Oct. 9 | | $_iP_Z$ | 03 07 10 | | | | | | The amplitudes of the initial phases were so large as to eliminate any possibility of reading the time on vertical component. Pz is indicated. |
| | | $_iP_E$ | 03 07 12 | | | | | | |
| | | $_iP_N$ | 03 07 12 | | | | | | |
| | | $PR_{1E}$ | 03 07 54 | | | | | | |
| | | $PR_{1N}$ | 03 07 54 | | | | | | |
| | | $PR_{2E}$ | 03 08 05 | | | | | | |
| | | $_iS_E$ | 03 11 57 | | | | | | |
| | | $_eS_N$ | 03 11 58 | | | | | | |
| | | $SR_{1E}$ | 03 13 23 | | | | | | |
| | | $SR_{1N}$ | 03 13 15 | | | | | | |
| | | $SR_{2E}$ | 03 13 34 | | | | | | |
| | | $SR_{2N}$ | 03 13 25 | | | | | | |
| | | $SR_{3E}$ | 03 13 45 | | | | | | |
| | | $_eL_E$ | 03 14 18 | | | | | | |
| | | $_eL_N$ | 03 14 25 | | | | | | |
| | | $L_E$ | 03 17 10 | | | | | | |
| | | $M_{1E}$ | 03 19 20 | | | | 8.0mm. | | |
| | | $M_{1N}$ | 03 20 23 | 11 | 2.6mm. | | | | |
| | | $M_{2E}$ | 03 22 48 | 11 | | | 11.0mm. | | |
| | | $M_{2N}$ | 03 23 40 | 13 | 4.1mm. | | | | |
| | | $M_{3E}$ | 03 24 37 | 16 | | | 7.2mm. | | |
| | | $F_E$ | 05 05 | | | | | | |
| | | $F_N$ | 04 50 | | | | | | |
| | | $F_Z$ | 08 (ca.) | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | AMPLITUDE ◿ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 9 | | $_eL_Z$ | 15 36 26 | | | | | | Earlier phases lost in heavy micros. |
| | | $L_Z$ | 15 40 06 | | | | | | |
| | | $M_Z$ | 15 50 29 | 17 | | | 2.8mm. | | |
| | | $F_Z$ | 16 30 | | | | | | |
| Oct. 10 | | $_eL_Z$ | 21 31 09 | | | | | | No distinctM. |
| | | $L_Z$ | 21 40 38 | 15-16 | | | | | |
| | | $F_Z$ | 22 (ca.) | | | | | | |
| Oct. 11 | | $e_Z$ | 04 31 | | | | | | Very heavy micros. |
| | | $F_Z$ | 04 41 | | | | | | |
| Oct. 12 | | $e_Z$ | 00 33 | | | | | | Possibly sooner. |
| | | $_eL_Z$ | 00 36 24 | | | | | | |
| | | $L_Z$ | 00 39 05 | 11 | | | | | |
| | | $L_Z$ | 00 47 00 | 15 | | | | | |
| | | $F_Z$ | 00 58 | | | | | | |
| Oct. 12 | | $e_Z$ | 07 42 00 | | | | | | Heavy micros. |
| | | $e_Z$ | 07 53 18 | | | | | | |
| | | $_eL_Z$ | 08 11 06 | | | | | | |
| | | $L_Z$ | 08 22 06 | 9 | | | | | |
| | | $M_{1Z}$ | 08 30 11 | 17 | | | 5.0mm. | | |
| | | $M_{2Z}$ | 08 38 16 | 20 | | | 6.3mm. | | |
| | | $F_Z$ | 09 (ca.) | | | | | | |
| Oct. 12 | | $_eL_Z$ | 09 08 26 | | | | | | |
| | | $L_Z$ | 09 13 14 | 17 | | | | | |
| | | $M_Z$ | 09 14 21 | 15-16 | | | 6.3mm. | | |
| | | $F_Z$ | 09 58 | | | | | | |
| Oct. 12 | | $e_Z$ | 23 23 43 | | | | | | Very heavy micros. |
| | | $L_Z$ | 23 24 21 | | | | | | |
| | | $F_Z$ | 23 31 | | | | | | |
| Oct. 13 | | $e_Z$ | 13 28 05 | | | | | | Very heavy micros. |
| | | $_eL_Z$ | 13 30 10 | | | | | | |
| | | $F_Z$ | 13 48 | | | | | | |
| Oct. 13 | | $L_Z$ | 16 34 16 | | | | | | |
| | | $F_Z$ | Lost in heavy micros. | | | | | | |
| Oct. 15 | | $e_Z$ | 09 03 01 | | | | | | |
| | | $e_Z$ | 09 17 51 | | | | | | |
| | | $_eL_Z$ | 09 31 33 | | | | | | |
| | | $L_Z$ | 09 35 00 | 21 | | | | | |
| | | $M_{1Z}$ | 09 37 04 | 21 | | | 4.7mm. | | |
| | | $M_{2Z}$ | 09 39 29 | 16 | | | 6.0mm. | | |
| | | $M_{3Z}$ | 09 41 47 | 19 | | | 4.2mm. | | |
| | | $F_Z$ | 10 45 | | | | | | |
| Oct. 15 | | $e_Z$ | 14 33 53 | | | | | | |
| | | $P_{R1Z}$? | 14 38 11 | | | | | | |
| | | PS? | 14 47 29 | | | | | | |
| | | $e_Z$ | 14 48 31 | | | | | | |
| | | $i_Z$ | 15 03 27 | | | | | | |
| | | $_eL_Z$ | 15 08 17 | | | | | | |
| | | $L_Z$ | 15 12 00 | 37 | | | | | |
| | | $M_{1Z}$ | 15 20 21 | 22 | | | 23.0mm. | | |
| | | $M_{2Z}$ | 15 22 33 | 21 | | | 35.0mm. | | |
| | | $F_Z$ | 17 10 | | | | | | |
| Oct. 17 | | $e_Z$ | 06 46 | | | | | | Very irregular movement throughout. |
| | | $L_Z$ | 07 22 12 | 17 | | | | | |
| | | $L_Z$ | 07 28 13 | 9 | | | | | |
| | | $F_Z$ | 08 09 | | | | | | |
| Oct. 17 | | $e_Z$ | 15 33 13 | | | | | | |
| | | $e_Z$ | 15 37 20 | | | | | | |
| | | $e_Z$ | 15 45 28 | | | | | | |
| | | $_eL_Z$? | 15 59 13 | | | | | | |
| | | $L_Z$ | 16 04 54 | 20 | | | | | |
| | | $M_{1Z}$ | 16 12 12 | 22 | | | 4.9mm. | | |
| | | $M_{2Z}$ | 16 16 17 | 19 | | | 4.7mm. | | |
| | | $M_{3Z}$ | 16 20 35 | 18-19 | | | 7.3mm. | | |
| | | $F_Z$ | 18 33 | | | | | | |
| Oct. 19 | | $e_Z$ | 06 15 | | | | | | Heavy micros. |
| | | $_eL_Z$? | 06 21 09 | | | | | | |
| | | $F_Z$ | 06 40 | | | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS



October 1 to October 31, 1928.

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | AMPLITUDE ◿ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| Oct. 19 | | $e_Z$ | 10 39 13 | | | | | | |
| | | $i_Z$ | 10 48 39 | | | | | | |
| | | $e_{L_Z}$ | 11 16 34 | | | | | | |
| | | $L_Z$ | 11 21 24 | 22 | | | | | |
| | | $M_{1Z}$ | 11 26 08 | 16 | | | 10.0mm. | | |
| | | $M_{2Z}$ | 11 33 14 | | | | 15.2mm. | | |
| | | F | 13 28 (ca.) | | | | | | |
| Oct. 19 | | $e_Z$ | 15 45 40 | | | | | | |
| | | $e_Z$ | 15 49 45 | | | | | | |
| | | $e_{L_Z}$ | 15 54 12 | | | | | | |
| | | $L_Z$ | 15 55 35 | 8-9 | | | | | No distinctM. |
| | | F | 16 20 | | | | | | |
| Oct. 20 | | $e_Z$ | 13 08 19 | | | | | | |
| | | $e_Z$ | 13 14 35 | | | | | | |
| | | $e_{L_Z}$ | 13 45 27 | | | | | | |
| | | $L_Z$ | 13 52 08 | 11 | | | | | |
| | | $M_Z$ | 13 54 36 | 21 | | | 4.6mm. | | |
| | | $F_Z$ | 14 50 (ca.) | | | | | | |
| Oct. 23 | | $iP_Z$ | 18 04 15 | | | | | | |
| | | $S_Z$? | 18 14 31 | | | | | | |
| | | $e_Z$ | 18 19 20 | | | | | | |
| | | $e_{L_Z}$ | 18 31 19 | | | | | | |
| | | $M_{1Z}$ | 18 41 29 | 21-22 | | | 3.8mm. | | |
| | | $M_{2Z}$ | 18 44 16 | 13 | | | 4.0mm. | | |
| | | $M_{3Z}$ | 18 47 00 | 17 | | | 4.0mm. | | |
| | | $M_{4Z}$ | 18 50 09 | 15-16 | | | 4.0mm. | | |
| | | $F_Z$ | 19 42 | | | | | | |
| Oct. 25 | | $iP_Z$ | 12 39 04 | | | | | | |
| | | $P_{R_{1Z}}$ | 12 39 54 | | | | | | |
| | | $P_{R_{2Z}}$ | 12 40 05 | | | | | | |
| | | $S_Z$ | 12 44 14 | | | | | | |
| | | $S_{R_{1Z}}$ | 12 45 24 | | | | | | |
| | | $M_Z$ | 12 50 06 | | | | 63.0mm. | | Other Maxima off sheet. Time obliterated. |
| | | $F_Z$ | 14 56 | | | | | | |
| Oct. 28 | | $e_Z$ | 14 43 23 | | | | | | |
| | | $e_{L_Z}$ | 14 53 08 | | | | | | |
| | | $L_Z$ | 14 56 39 | 9-10 | | | | | |
| | | $M_Z$ | 15 04 39 | 9 | | | 2.8mm. | | |
| | | $F_Z$ | 15 15 | | | | | | |
| Oct. 30 | | $e_{L_Z}$ | 00 10 24 | | | | | | |
| | | $F_Z$ | 00 35 | | | | | | |
| Oct. 30 | | $P_Z$ | 04 29 18 | | | | | | |
| | | $P_{R_{2Z}}$ | 04 30 28 | | | | | | |
| | | $S_Z$? | 04 34 08 | | | | | | |
| | | $S_{R_{1Z}}$? | 04 35 30 | | | | | | |
| | | $S_{R_{2Z}}$? | 04 35 45 | | | | | | |
| | | $e_{L_Z}$ | 04 38 26 | | | | | | |
| | | $L_Z$ | 04 39 16 | 18 | | | | | |
| | | $M_{1Z}$ | 04 42 52 | 17 | | | 7.2mm. | | |
| | | $M_{2Z}$ | 04 45 08 | 14 | | | 11.0mm. | | |
| | | $F_Z$ | 06 05 | | | | | | |
| Oct. 30 | | $e_Z$ | 06 43 13 | | | | | | |
| | | $L_Z$ | 06 48 39 | | | | | | |
| | | $F_Z$ | 07 05 | | | | | | |
| Oct. 30 | | $e_Z$ | 07 21 17 | | | | | | |
| | | $e_Z$ | 07 25 38 | | | | | | |
| | | $e_Z$ | 07 35 33 | | | | | | |
| | | $i_Z$ | 07 41 27 | | | | | | |
| | | $L_Z$? | 07 44 14 | 10 | | | | | |
| | | $M_Z$ | 07 44 47 | 11 | | | 3.9mm. | | |
| | | $F_Z$ | 08 (ca.) | | | | | | |
| Oct. 31 | | $e_Z$ | 20 16 | | | | | | Very heavy micros. |
| | | $e_{L_Z}$? | 20 56 | | | | | | |
| | | $L_Z$ | 21 01 26 | 16 | | | | | |
| | | $F_Z$ | Lost in micros | | | | | | |

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## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Nov. 1 | | $iP_Z$ | 04 18 34 | | | | | | Rest of phases in the vertical component impossible to be read because of too great amplitude and obliteration of time |
| | | $P_E$ | 04 18 34 | | | | | | |
| | | $ePN$ | 04 18 35 | | | | | | |
| | | $iPR_{1Z}$ | 04 19 13 | | | | | | |
| | | $PR_{1E}$ | 04 19 07 | | | | | | |
| | | $iPR_{2Z}$ | 04 19 27 | | | | | | |
| | | $PR_{2E}$ | 04 19 28 | | | | | | |
| | | $PR_{3E}$ | 04 19 31 | | | | | | |
| | | $S_Z$ | 04 23 11 | | | | | | |
| | | $iS_E$ | 04 23 22 | | | | | | |
| | | $S_N$ | 04 23 15 | | | | | | |
| | | $eL_E$ | 04 25 18 | | | | | | |
| | | $eL_N$ | 04 25 31 | | | | | | |
| | | $L_E$ | 04 26 07 | 5 | | | | | |
| | | $L_N$ | 04 26 15 | 5 | | | | | |
| | | $M_E$ | 04 27 18 | 5 | | 25.4mm. | | | |
| | | $M_N$ | 04 27 08 | 5 | 14.7mm. | | | | |
| | | $F_Z$ | 06 22 | | | | | | |
| Nov. 1 | | $eP_Z$ | 16 15 23 | | | | | | Difficult. |
| | | $PR_{1Z}$ | 16 16 53 | | | | | | |
| | | $S_Z$? | 16 21 49 | | | | | | |
| | | $eL_Z$ | 16 25 23 | 12 | | | | | |
| | | $M_{1Z}$ | 16 31 19 | 14 | | 7.9mm. | | | |
| | | $M_{2Z}$ | 16 32 41 | 16 | | 7.8mm. | | | |
| | | $M_{3Z}$ | 16 38 00 | 14 | | 7.0mm. | | | |
| | | $F_Z$ | 17 10 | | | | | | |
| Nov. 3 | | $P_E$ | 04 04 23 | | | | | | |
| | | $iS_E$ | 04 05 34 | | | | | | |
| | | $S_N$ | 04 05 35 | | | | | | |
| | | $eL_Z$ | 04 05 37 | | | | | | |
| | | $M_E$ | 04 06 08 | | | | | | |
| | | $M_N$ | 04 06 00 | | | | | | |
| | | $M_Z$ | 04 06 07 | 4-5 | | 22.5mm. | | | |
| | | $F_Z$ | 04 10 | | | | | | |
| Nov. 6 | | $P'_Z$ | 04 25 10 | | | | | | Very heavy micros. Possibly PS. |
| | | $i_Z$ | 04 38 02 | | | | | | |
| | | $eL_Z$ | 05 04 36 | | | | | | |
| | | $M_{1Z}$ | 05 10 18 | 21 | | 26.9mm. | | | |
| | | $M_{2Z}$ | 05 15 16 | 19 | | 19.0mm. | | | |
| | | $M_{3Z}$ | 05 22 44 | 17 | | 24.3mm. | | | |
| | | $F_Z$ | 07 20 (et postea). | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Nov. 7 | | $_eL_Z$ | 15 55 25 | | | | | Very heavy micros masks all earlier phases |
| | | $L_Z$ | 15 58 03 | 19 | | | | |
| | | $M_{1Z}$ | 15 59 34 | 11-12 | | | 12.2mm. | |
| | | $M_{2Z}$ | 16 00 24 | 11 | | | 14.2mm. | |
| | | $M_{3Z}$ | 16 01 51 | 14 | | | 17.6mm. | |
| | | $F_Z$ | 16 32 | | | | | |
| Nov. 10 | | $e_Z$ | 13 10 32 | | | | | Very heavy micros. |
| | | $e_Z$ | 13 17 35 | | | | | |
| | | $_eL_Z$? | 13 31 22 | | | | | |
| | | $L_Z$ | 13 32 45 | 17 | | | | |
| | | $M_{1Z}$ | 13 34 01 | 20 | | | 6.5mm. | |
| | | $M_{2Z}$ | 13 41 26 | 13 | | | 5.4mm. | |
| | | $M_{3Z}$ | 13 45 57 | 16 | | | 8.5mm. | |
| | | $F_Z$ | 15 25 (ca.) | | | | | |
| Nov. 11 | | $e_Z$ | 23 58 | | | | | Very heavy micros. $e_Z$ possibly sooner. |
| | | $L_Z$ | 00 03 46 | 14 | | | | |
| | | $L_Z$ | 00 09 31 | 14 | | | | |
| | | $F_Z$ | 00 35 | | | | | |
| Nov. 15 | | $P_Z$ | 13 28 25 | | | | | |
| | | $_eS_Z$ | 13 37 06 | | | | | |
| | | $PS_Z$ | 13 37 40 | | | | | |
| | | $_eL_Z$ | 13 49 50 | | | | | |
| | | $M_{1Z}$ | 13 58 26 | 15 | | | 5.0mm. | |
| | | $M_{2Z}$ | 13 59 30 | 13 | | | 5.0mm. | |
| | | $F_Z$ | 15 10 | | | | | |
| Nov. 18 | | $e_Z$ | 18 48 16 | | | | | Very heavy micros. |
| | | $_eL_Z$ | 18 59 49 | | | | | |
| | | $F_Z$ | 19 20 (ca.) | | | | | |
| Nov. 19 | | $e_Z$ | 16 12 | | | | | |
| | | $i_Z$ | 16 32 49 | | | | | $_eL_Z$? |
| | | $L_Z$ | 16 38 08 | 8 | | | | |
| | | $L_Z$ | 16 40 49 | 9 | | | | |
| | | $F_Z$ | 17 30 | | | | | |
| Nov. 20 | | $i_{P_Z}$ | 20 45 27 | | | | | |
| | | $i_{P_N}$ | 20 45 30 | | | | | |
| | | $_eP_E$ | 20 45 30 | | | | | |
| | | $PR_{1_Z}$ | 20 48 19 | | | | | |
| | | $PR_{2_Z}$ | 20 49 49 | | | | | |
| | | $i_{S_Z}$ | 20 53 56 | | | | | |
| | | $i_{S_N}$ | 20 53 56 | | | | | |
| | | $i_{S_E}$ | 20 53 55 | | | | | |
| | | $i_{PS_Z}$ | 20 54 18 | | | | | |
| | | $i_{PS_E}$ | 20 54 17 | | | | | |
| | | $i_{PS_N}$ | 20 54 16 | | | | | |
| | | $S_{R_{1_Z}}$ | 21 01 12 | | | | | |
| | | $S_{R_{1_E}}$ | 21 01 17 | | | | | |
| | | $_eL_Z$ | 21 04 19 | | | | | |
| | | $L_Z$ | 21 07 29 | 22 | | | | |
| | | $M_{1Z}$ | 21 10 07 | 23 | | | 28.6mm. | |
| | | $M_{2Z}$ | 21 12 52 | 21 | | | 64.1mm. | |
| | | $M_{3Z}$ | 21 15 06 | 17-18 | | | | |
| | | $F_Z$ | 23 50 (ca.) | | | | | |
| Nov. 22 | | $e_Z$ | 08 51 46 | | | | | Very heavy micros. |
| | | $e_Z$ | 08 54 11 | | | | | |
| | | $e_Z$ | 08 55 11 | | | | | |
| | | $_eL_Z$ | 09 25 21 | | | | | |
| | | $M_{1Z}$ | 09 28 51 | 22 | | | 8.8mm. | |
| | | $M_{2Z}$ | 09 36 42 | 18 | | | 8.1mm. | |
| | | $F_Z$ | 11 30 | | | | | |
| Nov. 27 | | $e_N$ | 09 30 56 | | | | | Quake can not be read on the vertical component because of time not marking evenly. |
| | | $e_E$ | 09 30 52 | | | | | |
| | | $L_N$ | 09 43 43 | 4 | | | | |
| | | $L_E$ | 09 43 43 | 3-4 | | | | |
| | | $M_N$ | 09 44 25 | 3 | 0.2mm. | | | |
| | | $M_E$ | 09 44 15 | 3 | | 0.4mm. | | |
| | | $F_N$ | 09 55 (ca.) | | | | | |
| | | $F_E$ | 10 05 (ca.) | | | | | |

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# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Dec. 1 | | $iP_Z$ | 04 17 47 | | | | | | |
| | | $eP_E$? | 04 17 56 | | | | | | |
| | | $P_N$ | 04 17 49 | | | | | | |
| | | $PR1_Z$ | 04 21 01 | | | | | | |
| | | $PR1_E$ | 04 21 16 | | | | | | |
| | | $PR1_N$ | 04 21 14 | | | | | | |
| | | $PR2_Z$ | 04 22 42 | | | | | | |
| | | $PR2_E$ | 04 22 35 | | | | | | |
| | | $PR2_N$ | 04 22 36 | | | | | | |
| | | $PR3_Z$ | 04 23 13 | | | | | | |
| | | $PR3_E$ | 04 23 12 | | | | | | |
| | | $iS_Z$ | 04 27 21 | | | | | | |
| | | $S_E$ | 04 27 22 | | | | | | |
| Dec. 1 | | $S_N$ | 04 27 22 | | | | | | |
| | | $PS_N$ | 04 28 01 | | | | | | |
| | | $eL_E$ | 04 38 18 | | | | | | |
| | | $eL_N$ | 04 39 06 | | | | | | |
| | | $M1_E$ | 04 47 09 | 19 | | 1.3mm. | | | |
| | | $M1_N$ | 04 50 30 | 18-19 | 1.0mm. | | | | |
| | | $M2_E$ | 04 50 33 | 23-24 | | 1.5mm. | | | |
| | | $M2_N$ | 04 52 30 | 20 | 1.3mm. | | | | |
| | | $M3_E$ | 04 52 41 | 21 | | 1.6mm. | | | |
| | | $M3_N$ | 04 55 41 | 17 | 1.1mm. | | | | |
| | | $M4_E$ | 04 54 52 | | | | | | |
| | | $F_Z$ | 09 22 | | | | | | |
| Dec. 1 | | $P_Z$? | 09 31 04 | | | | | | |
| | | $e_Z$ | 09 36 38 | | | | | | |
| | | $S_Z$? | 09 41 12 | | | | | | Heavy micros. |
| | | $L_Z$ | 10 04 31 | | | | | | |
| | | $F_Z$ | 11 05 (ca.) | | | | | | No distinct M. |
| Dec. 1 | | $iP_Z$ | 18 44 00 | | | | | | |
| | | $S_Z$ | 18 53 28 | | | | | | |
| | | $PS_Z$ | 18 54 08 | | | | | | |
| | | $eL_Z$ | 19 07 10 | | | | | | |
| | | $L_Z$ | 19 17 50 | 10-11 | | | | | |
| | | $F_Z$ | 19 54 | | | | | | |
| Dec. 2 | | $e_Z$ | 03 21 23 | | | | | | |
| | | $L_Z$ | 03 27 46 | 6 | | | | | |
| | | $F_Z$ | 03 38 | | | | | | |
| Dec. 2 | | $iP_Z$ | 04 32 00 | | | | | | |
| | | $PR1_Z$ | 04 35 14 | | | | | | Heavy micros. |
| | | $S_Z$ | 04 41 24 | | | | | | |
| | | $eL_Z$ | 04 54 38 | | | | | | |
| | | $M1_Z$ | 05 06 59 | 20 | | 27.4mm. | | | |
| | | $M2_Z$ | 05 08 22 | 20 | | 34.0mm. | | | |
| | | $M3_Z$ | 05 09 52 | 18 | | 19.3mm. | | | |
| | | $F_Z$ | 07 55 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Dec. 10 | | $i_Z$ | 13 47 09 | | | | | Very difficult. Heavy & irregular micros mask the gram. |
| | | $e_Z$ | 13 59 27 | | | | | |
| | | $e_Z$ | 14 02 04 | | | | | |
| | | $e_Z$ | 14 28 47 | | | | | |
| | | $L_Z$? | 14 39 28 | | | | | No distinct M. |
| | | $L_Z$? | 14 43 09 | | | | | |
| | | $F_Z$ | | | | | | |
| Dec. 10 | | $e_Z$ | 15 17 55 | | | | | Overlapping in following quake. Beginning very uncertain. |
| | | $e_Z$ | 15 30 57 | | | | | Heavy and irregular micros |
| | | $e_Z$ | 15 46 55 | | | | | |
| | | $e_Z$ | 15 59 29 | | | | | |
| | | $L_Z$? | 16 01 56 | | | | | No distinct M. |
| | | $F_Z$ | 16 45 (ca.) | | | | | |
| Dec. 11 | | $e_Z$ | 19 36 14 | | | | | Heavy micros. |
| | | $L_Z$ | 19 41 47 | 8 | | | | |
| | | $F_Z$ | 19 50 | | | | | |
| Dec. 12 | | $e_Z$? | 20 37 18 | | | | | Heavy micros. |
| | | $i_Z$ | 20 39 27 | | | | | $P'_Z$? |
| | | $e_Z$ | 20 49 00 | | | | | $S_Z$? |
| | | $e_Z$ | 20 50 10 | | | | | $PS_Z$? |
| | | $eL_Z$? | 21 15 15 | | | | | Possibly much sooner. |
| | | $L_Z$ | 21 18 00 | 18-19 | | | | |
| | | $M_{1Z}$ | 21 22 07 | 18 | | | 25.4mm. | |
| | | $M_{2Z}$ | 21 27 41 | 17 | | | 19.3mm. | |
| | | $M_{3Z}$ | 21 31 29 | 16-17 | | | 18.0mm. | |
| | | $M_{4Z}$ | 21 36 39 | 15-16 | | | 28.7mm. | |
| | | $F_Z$ | 23 50 | | | | | |
| Dec. 14 | | $e_Z$ | 01 24 48 | | | | | |
| | | $eL_Z$ | 01 32 07 | | | | | |
| | | $F_Z$ | 01 50 | | | | | |
| Dec. 14 | | $L_Z$? | 03 16 20 | 9 | | | | |
| | | $F_Z$ | 03 26 | | | | | |
| Dec. 14 | | $e_Z$ | 23 59 48 | | | | | Heavy micros. |
| | | $e_Z$ | 00 08 14 | | | | | |
| | | $e_Z$ | 00 16 35 | | | | | |
| | | $eL_Z$ | 00 21 46 | | | | | Possibly soone |
| | | $L_Z$ | 00 24 32 | 18-19 | | | | No distinct M. |
| | | $F_Z$ | 01 25 (ca.) | | | | | |
| Dec. 15 | | $e_Z$ | 20 13 06 | | | | | Possibly soone: Irregular micr |
| | | $e_Z$ | 20 26 42 | | | | | |
| | | $L_Z$ | 20 27 46 | | | | | |
| | | $M_Z$ | 20 28 45 | 9 | | | 6.5mm. | |
| | | $F_Z$ | 20 51 (ca.) | | | | | |
| Dec. 16 | | $e_Z$ | 02 18 06 | | | | | Very irregular micros. Possibly not seismic. |
| | | $e_Z$ | 02 24 28 | | | | | |
| | | $L_Z$ | 02 26 30 | 8-9 | | | | |
| | | $F_Z$ | 02 30 | | | | | |
| Dec. 16 | | $eL_Z$ | 19 44 03 | | | | | |
| | | $L_Z$ | 19 48 11 | 8 | | | | |
| | | $F_Z$ | 19 54 | | | | | |
| Dec. 17 | | $eL_Z$ | 04 59 42 | | | | | Irregular micr |
| | | $eL_Z$ | 05 10 16 | | | | | |
| | | $F_Z$ | 05 24 | | | | | |
| Dec. 17 | | $e_Z$ | 06 34 47 | | | | | Irregular micr |
| | | $L_Z$ | 06 36 44 | 7-8 | | | | |
| | | $F_Z$ | 06 41 | | | | | |
| Dec. 19 | | $eP_Z$ | 11 56 26 | | | | | |
| | | $eP_N$? | 11 56 43 | | | | | |
| | | $eP_E$? | 11 56 46 | | | | | |
| | | $i_Z$ | 11 58 39 | | | | | |
| | | $i_Z$ | 12 00 00 | | | | | |
| | | $i_Z$ | 12 00 53 | | | | | |
| | | $PR_{1Z}$ | 12 01 20 | | | | | |
| | | $eS_E$? | 12 11 00 | | | | | |
| | | $eL_E$ | 12 35 22 | | | | | |
| | | $eL_Z$ | 12 38 00 | | | | | |
| | | $L_Z$ | 12 43 29 | 29-30 | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Dec. 3 | | eZ | 12 33 28 | | | | | |
| | | SZ? | 12 42 16 | | | | | |
| | | M1Z | 12 47 24 | 8 | | | 5.7mm. | |
| | | M2Z | 12 48 32 | 6 | | | 6.2mm. | |
| | | M3Z | 12 52 36 | 10 | | | 6.0mm. | |
| | | M4Z | 12 53 28 | 10 | | | 6.2mm. | |
| | | FZ | 13 51 | | | | | |
| Dec. 4 | | eZ | 01 59 46 | | | | | Very irregular micros. |
| | | LZ | 02 03 27 | 9 | | | | |
| | | FZ | 02 09 | | | | | |
| Dec. 5 | | eZ? | 02 47 05 | | | | | Very difficult. Heavy and irregular micros. |
| | | eZ | 02 52 29 | | | | | |
| | | eZ | 02 59 36 | | | | | |
| | | eZ | 03 06 41 | | | | | |
| | | FZ | 03 18 | | | | | |
| Dec. 5 | | eZ? | 11 03 06 | | | | | Very difficult. Irregular micros mask the gram. |
| | | eZ | 11 16 05 | | | | | |
| | | eZ | 11 21 20 | | | | | |
| | | eZ | 11 24 42 | | | | | |
| | | eZ | 11 27 00 | | | | | |
| | | FZ | 11 48 | | | | | |
| Dec. 7 | | eZ | 09 33 26 | | | | | P'? |
| | | eZ | 09 36 57 | | | | | |
| | | iZ | 09 42 22 | | | | | |
| | | eZ | 09 46 09 | | | | | |
| | | iZ | 09 57 39 | | | | | |
| | | eZ | 10 04 28 | | | | | |
| | | eLZ | 10 19 22 | | | | | |
| | | LZ | 10 22 02 | 28-29 | | | | |
| | | M1Z | 10 33 19 | 21-22 | | | 10.1mm. | |
| | | M2Z | 10 37 46 | 18 | | | 10.2mm. | |
| | | M3Z | 10 40 34 | 19-20 | | | 10.5mm. | |
| | | M4Z | 10 44 27 | 17-18 | | | 9.7mm. | |
| | | M5Z | 10 48 48 | 16-17 | | | 7.5mm. | |
| | | FZ | 12 05 (ca.) | | | | | |
| Dec. 9 | | eZ | 00 28 42 | | | | | Very difficult. Possibly sooner. Heavy and irregular micros mask the gram. |
| | | eZ | 00 33 43 | | | | | |
| | | eZ | 00 45 42 | | | | | |
| | | eZ | 00 56 01 | | | | | |
| | | eZ | 01 09 46 | | | | | |
| | | LZ | 01 21 15 | 16-17 | | | | No distinct M. |
| | | FZ | 02 15 (ca.) | | | | | |
| Dec. 9 | | eZ | 05 35 23 | | | | | Very difficult. Heavy and irregular micros all through. |
| | | eZ | 05 47 17 | | | | | |
| | | eZ | 05 51 12 | | | | | |
| | | eLZ? | 06 09 02 | | | | | |
| | | LZ | 06 19 55 | 15-17 | | | | No distinct M. |
| | | FZ | 07 40 (ca.) | | | | | |
| Dec. 9 | | eZ | 12 06 28 | | | | | |
| | | eLZ | 12 12 05 | | | | | |
| | | LZ | 12 15 21 | 10 | | | | |
| | | FZ | 12 26 | | | | | |
| Dec. 9 | | eZ | 13 09 05 | | | | | Possibly sooner Heavy and irregular micros. |
| | | eZ | 13 17 09 | | | | | |
| | | eZ | 13 21 17 | | | | | |
| | | FZ | 13 26 (ca.) | | | | | |
| Dec. 9 | | eZ | 18 37 24 | | | | | P' ? Heavy and irregular micros |
| | | eZ | 18 41 22 | | | | | $P R_{1Z}$? |
| | | eZ | 18 50 07 | | | | | $P S_Z$? |
| | | eLZ | 19 16 08 | | | | | |
| | | MZ | 19 33 23 | 16-17 | | | 5.7mm. | |
| | | FZ | 20 30 (ca.) | | | | | |
| Dec. 10 | No record from 00 o'clock to 13 hrs. 15 ms. Galvanometer out of commission. | | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | cont'd. | | | | | | | |
| Dec. 19 | | $M_{1E}$ | 12 55 54 | 20 | | 0.7mm. | | |
| | | $M_N$ | 12 57 16 | 21 | 0.5mm. | | | |
| | | $M_{1Z}$ | 12 57 18 | 21 | | | 51.7-mm. | Off sheet. |
| | | $M_{2E}$ | 12 57 27 | 19 | | 0.8mm. | | |
| | | $M_{2Z}$ | 13 00 38 | 18 | | | 38.5-mm. | Off sheet. |
| | | $M_{3Z}$ | 13 03 36 | 17 | | | 45.0-mm. | Off sheet. |
| | | $M_{4Z}$ | 13 05 25 | 17-18 | | | 43.0-mm. | Off sheet. |
| | | $F_Z$ | 14 43 | | | | | |
| Dec. 26 | | $P_Z$ | 21 40 23 | | | | | |
| | | $_ePNE$ | 21 40 28 | | | | | |
| | | $P_{R1_Z}$ | 21 41 48 | | | | | |
| | | $P_{R1_{NE}}$ | 21 42 01 | | | | | |
| | | $_iS_Z$ | 21 46 24 | | | | | |
| | | $_eS_N$? | 21 46 35 | | | | | |
| | | $_eS_E$? | 21 46 27 | | | | | |
| | | $S_{R1_Z}$ | 21 49 16 | | | | | |
| | | $S_{R2_Z}$ | 21 49 51 | | | | | |
| | | $_eL_Z$ | 21 52 00 | | | | | |
| | | $M_Z$ | 21 55 08 | | | | | |
| | | $F_Z$ | 22 46 | | | | | |
| Dec. 28 | | $e_Z$ | 14 41 07 | | | | | $P_Z$?: $P'_Z$? |
| | | $e_Z$ | 14 46 21 | | | | | $P_{R1_Z}$ ? |
| | | $e_Z$ | 14 50 14 | | | | | $P_{R2_Z}$ |
| | | $PS_Z$ | 14 58 11 | | | | | ?? |
| | | $_eL_Z$ | 15 22 52 | | | | | |
| | | $L_Z$ | 15 30 55 | 19-20 | | | | |
| | | $M_{1Z}$ | 15 40 16 | 19-20 | | | 13.0mm. | |
| | | $M_{2Z}$ | 15 43 03 | 20 | | | 13.9mm. | |
| | | $F_Z$ | 17 (ca.) | | | | | |

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$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 6 | | $P_Z$? | 00 07 43 | | | | | | |
| | | $S_Z$? | 00 14 55 | | | | | | |
| | | $eL_Z$ | 00 21 24 | | | | | | |
| | | $M_Z$ | 00 30 06 | | | | | | |
| | | $F_Z$ | 01 (ca.) | | | | | | |
| Jan. 8 | | $i_Z$ | 08 40 08 | | | | | | Very heavy micros. |
| | | $eL_Z$? | 08 41 02 | 9 | | | | | |
| | | $F_Z$? | | | | | | | |
| Jan. 11 | | $e_Z$ | 14 15 48 | | | | | | |
| | | $e_Z$ | 14 23 16 | | | | | | |
| | | $eL_Z$ | 14 44 35 | | | | | | No distinct M. |
| | | $F_Z$ | 15 05 | | | | | | |
| Jan.13 | | $iP_Z$ | 00 15 11 | | | | | | |
| | | $eP_E$ | 00 15 12 | | | | | | |
| | | $eP_N$ | 00 15 14 | | | | | | |
| | | $iS_E$ | 00 25 05 | | | | | | |
| | | $eS_N$ | 00 25 08 | | | | | | |
| | | $S_Z$ | 00 25 08 | | | | | | |
| | | $PS_E$ | 00 25 50 | | | | | | |
| | | $SR_{2E}$ | 00 34 30 | | | | | | |
| | | $eL_E$ | 00 39 17 | | | | | | |
| | | $L_E$ | 00 41 49 | 15 | | | | | |
| | | $L_N$ | 00 41 52 | 14-15 | | | | | |
| | | $M_E$ | 00 48 10 | 15-16 | | 3.6mm. | | | |
| | | $M_N$ | 00 52 09 | 17 | 1.2mm. | | | | |
| | | F | 02 40 | | | | | | |
| Jan. 13 | | $e_Z$ | 15 08 33 | | | | | | |
| | | $e_Z$ | 15 26 12 | | | | | | |
| | | $e_Z$ | 15 33 44 | | | | | | |
| | | $e_Z$ | 15 55 04 | | | | | | |
| | | $e_Z$ | 16 00 06 | | | | | | |
| | | $eL_Z$? | 16 03 29 | | | | | | |
| | | $L_Z$ | 16 09 56 | 13 | | | | | |
| | | $M_{1Z}$ | 16 11 06 | 13 | | 7.0mm. | | | |
| | | $M_{2Z}$ | 16 12 08 | 13 | | 6.0mm. | | | |
| | | $F_Z$ | 16 46 | | | | | | |
| Jan. 13 | | $e_Z$ | 19 06 38 | | | | | | Difficult - Very small movements masked by irregular micros. |
| | | $e_Z$ | 19 14 24 | | | | | | |
| | | $e_Z$ | 19 29 46 | | | | | | |
| | | $e_Z$ | 19 34 07 | | | | | | |
| | | $e_Z$ | 19 43 36 | | | | | | |
| | | $eL_Z$? | 19 46 15 | | | | | | No distinct M. |
| | | $F_Z$ | 20 00 (ca.) | | | | | | |
| Jan. 13 | | $e_Z$ | 21 38 56 | | | | | | Difficult. Small movements masked by troublesome micros. |
| | | $e_Z$ | 21 46 48 | | | | | | |
| | | $e_Z$ | 21 53 36 | | | | | | |
| | | $e_Z$ | 21 55 49 | | | | | | |
| | | $i_Z$ | 21 57 22 | | | | | | $M_Z$? |
| | | F | 22 11 (ca.) | | | | | | |

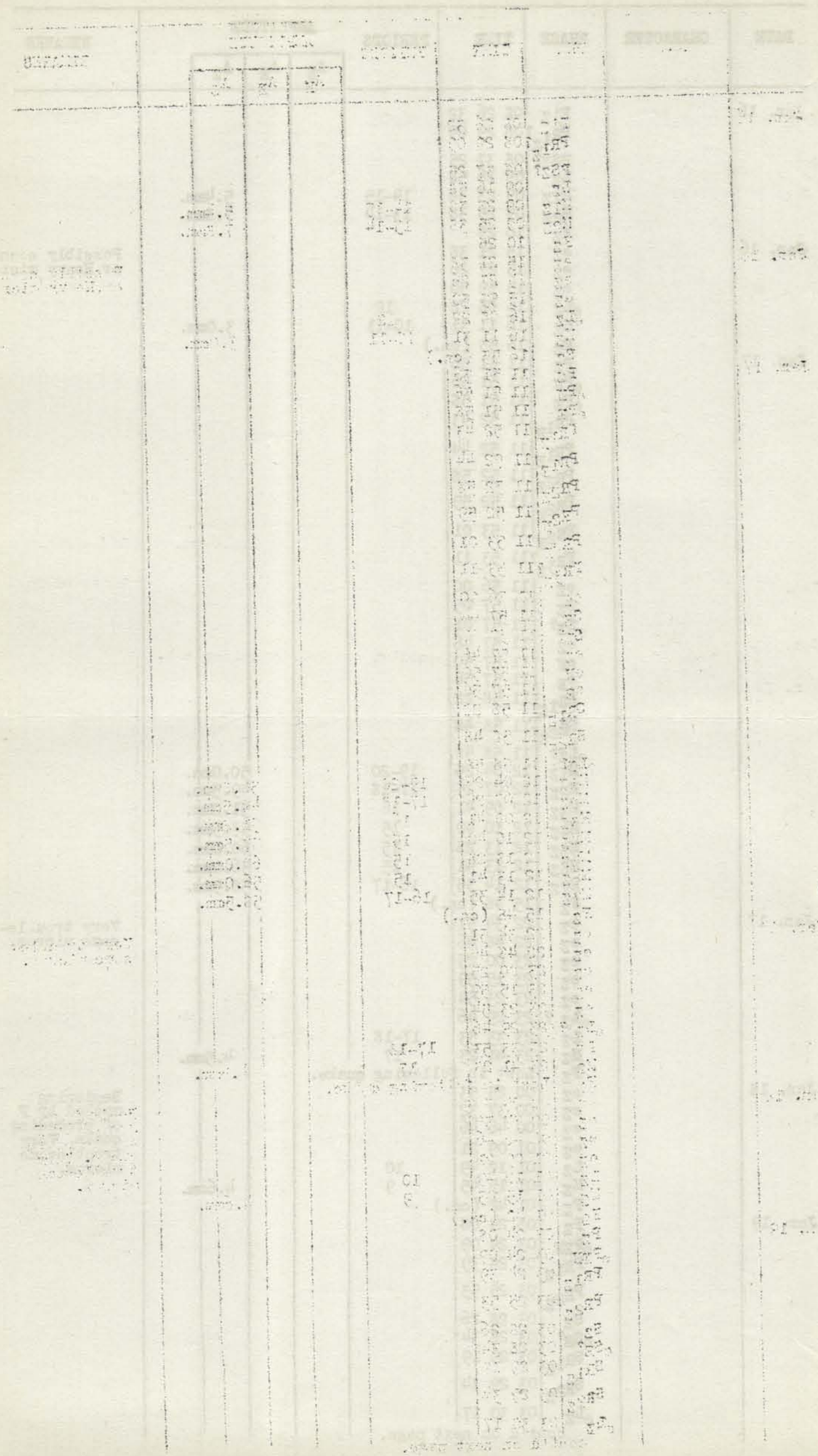
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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Jan. 16 | | $P'_Z$ | 08 26 32 | | | | | |
| | | $PR_{1_Z}$ | ?08 29 09 | | | | | |
| | | $PS_Z$? | 08 37 25 | | | | | |
| | | $L_Z$ | 09 16 58 | | | | | |
| | | $M_{1Z}$ | 09 23 38 | 14-15 | | | 5.4mm. | |
| | | $M_{2Z}$ | 09 25 38 | 13-14 | | | 7.8mm. | |
| | | $F_Z$ | 10 25 | | | | | |
| Jan. 16 | | $e_Z$ | 15 21 38 | | | | | Possibly sooner. Heavy micr |
| | | $e_Z$ | 15 27 26 | | | | | |
| | | $e_Z$ | 15 59 50 | | | | | |
| | | $e_{L_Z}$ | 16 08 22 | 12 | | | | |
| | | $M_Z$ | 16 11 31 | 10-11 | | | 3.0mm. | |
| | | $F_Z$ | 16 55 (ca.) | | | | | |
| Jan. 17 | | $P_Z$ | 11 51 56 | | | | | |
| | | $e_{P_N}$ | 11 51 56 | | | | | |
| | | $e_{P_E}$ | 11 51 58 | | | | | |
| | | $PR_{1_N}$ | 11 52 43 | | | | | |
| | | $PR_{1_E}$ | 11 52 44 | | | | | |
| | | $PR_{2_Z}$ | 11 52 58 | | | | | |
| | | $PR_{2_N}$ | 11 52 59 | | | | | |
| | | $PR_{2_E}$ | 11 53 01 | | | | | |
| | | $PR_{3_Z}$ | ?11 53 11 | | | | | |
| | | $e_Z$ | 11 56 00 | | | | | |
| | | $S_Z$ | 11 57 05 | | | | | |
| | | $S_E$? | 11 57 01 | | | | | |
| | | $e_Z$ | 11 57 46 | | | | | |
| | | $e_N$ | 11 57 50 | | | | | |
| | | $e_E$ | 11 57 56 | | | | | |
| | | $SR_{1_Z}$ | 11 58 22 | | | | | |
| | | $SR_{2_Z}$ | 11 58 48 | | | | | |
| | | $e_{L_Z}$? | 11 58 58 | | | | | |
| | | $M_{1Z}$ | 12 04 25 | 19-20 | | | 50.0mm. | |
| | | $M_{2Z}$ | 12 07 25 | 17-18 | | | 49.5mm. | |
| | | $M_{3Z}$ | 12 09 41 | 16 | | | 51.2mm. | |
| | | $M_{4Z}$ | 12 10 40 | 15 | | | 57.5mm. | |
| | | $M_{5Z}$ | 12 13 28 | 15 | | | 60.0mm. | |
| | | $M_{6Z}$ | 12 13 41 | 15 | | | 56.0mm. | |
| | | $M_{7Z}$ | 12 14 35 | 16-17 | | | 58.5mm. | |
| | | $F_Z$ | 15 48 (ca.) | | | | | |
| Jan. 17 | | $e_Z$ | 22 34 51 | | | | | Very troublesome micros. |
| | | $e_Z$ | 22 48 46 | | | | | |
| | | $e_Z$ | 23 00 25 | | | | | |
| | | $e_Z$ | 23 15 59 | | | | | |
| | | $e_Z$ | 23 23 54 | | | | | |
| | | $e_{L_Z}$ ? | 23 29 46 | | | | | |
| | | $L_Z$ | 23 33 53 | 17-18 | | | | |
| | | $M_Z$ | 23 41 23 | 17 | | | 4.5mm. | |
| | | $F_Z$ | Lost in following quake. | | | | | |
| Jan. 18 | | $e_Z$ | 00 25 53 | | | | | Beginning masked by F of preceding quake. Very troublesome micros. |
| | | $e_Z$ | 00 37 32 | | | | | |
| | | $e_Z$ | 00 46 46 | | | | | |
| | | $e_Z$ | 01 09 21 | | | | | |
| | | $L_Z$ | 01 12 49 | 10 | | | | |
| | | $M_Z$ | 01 15 45 | 9 | | | 4.6mm. | |
| | | $F_Z$ | 01 42 (ca.) | | | | | |
| Jan. 19 | | $P_Z$ | 03 24 08 | | | | | |
| | | $e_{P_{EN}}$ | 03 24 09 | | | | | |
| | | $PR_{1_Z}$ | 03 24 39 | | | | | |
| | | $PR_{2_Z}$ | 03 25 53 | | | | | |
| | | $S_Z$ | 03 28 26 | | | | | |
| | | $e_{S_E}$? | 03 28 34 | | | | | |
| | | $SR_{1_Z}$ | 03 29 19 | | | | | |
| | | $SR_{2_Z}$ | 03 29 34 | | | | | |
| | | $e_{L_Z}$ | 03 30 17 | | | | | |

cont'd on next page.

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International Seismological Centre From the ISC collection scanned by SISMOS



| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Jan. 19 | cont'd. | $L_Z$ | 03 34 36 | 20-21 | | | | |
| | | $M_Z$ | 03 37 30 | 17 | | | 48.8mm. | |
| | | $F_Z$ | 05 10 (ca.) | | | | | |
| Jan. 21 | | $e_Z$? | 04 57 16 | | | | | Heavy micros. |
| | | $L_Z$ | 05 15 40 | | | | | |
| | | $L_Z$ | 05 28 00 | | | | | |
| | | $L_Z$ | 05 33 28 | | | | | |
| | | $F_Z$ | Lost in microseisms. | | | | | |
| Jan. 21 | | $P_Z$ | 10 39 37 | | | | | |
| | | $P_{R_1Z}$ | 10 41 29 | | | | | |
| | | $P_{R_2Z}$ | 10 41 59 | | | | | |
| | | $P_{R_3Z}$ | 10 42 33 | | | | | |
| | | $S_Z$? | 10 46 45 | | | | | |
| | | $S_{R_1Z}$ | 10 50 22 | | | | | |
| | | $e_{L_Z}$ | 10 51 57 | | | | | |
| | | $M_{1Z}$ | 10 56 47 | 5-6 | | | 67.7mm. | |
| | | $M_{2Z}$ | 10 59 28 | 4-5 | | | 108.0-mm. | Off sheet. |
| | | $F_Z$ | 13 (ca.) | | | | | |
| Jan. 22 | | $e_Z$ | 19 44 00 | | | | | Heavy micros. |
| | | $L_Z$ | 19 49 14 | | | | | |
| | | $F_Z$ | 19 54 | | | | | |
| Jan. 24& 25 | From 22 hs. to 12 hs. G.M.T. pendulum checked by spider web. Gram therefore lost. | | | | | | | |
| Jan. 24 | | $P_Z$ | 20 42 39 | | | | | |
| | | $P_{EN}$? | 20 42 49 | | | | | |
| | | $P_{R_{1EN}}$ | 20 43 13 | | | | | |
| | | $S_Z$ | 20 47 12 | | | | | |
| | | $S_E$? | 20 47 09 | | | | | |
| | | $S_N$ | 20 47 13 | | | | | |
| | | $S_{R_{1N}}$ | 20 47 52 | | | | | |
| | | $S_{R_{1E}}$ | 20 47 55 | | | | | |
| | | $S_{R_{2N}}$ | 20 48 15 | | | | | |
| | | $S_{R_{2E}}$ | 20 48 16 | | | | | |
| | | $e_{L_Z}$ | 20 48 20 | | | | | |
| | | $e_{L_N}$ | 20 48 25 | | | | | |
| | | $e_{L_E}$ | 20 48 28 | | | | | |
| | | $M_{1N}$ | 20 53 02 | | 2.5mm. | | | |
| | | $M_{1E}$ | 20 53 49 | | | 4.8mm. | | |
| | | $M_Z$ | 20 54 00 | | | | 150.0mm. | Off scale. |
| | | $M_{2N}$ | 20 55 08 | | 3.2mm. | | | |
| | | $M_{2E}$ | 20 55 40 | | | 3.9mm. | | |
| | | $F_Z$? | | | | | | Sheet off at 21 hs. 45 ms., quake still on |
| Jan. 26 | | $e_Z$? | 01 47 45 | | | | | Very difficult Very heavy micros mask all phases. |
| | | $e_Z$ | 01 55 41 | | | | | $P'_Z$? |
| | | $e_Z$ | 02 05 22 | | | | | $PS_Z$? |
| | | $e_Z$ | 02 11 32 | | | | | $S_{R_1Z}$? |
| | | $e_Z$ | 02 25 30 | | | | | |
| | | $e_Z$ | 02 31 47 | | | | | |
| | | $e_{L_Z}$? | 02 43 48 | | | | | |
| | | $L_Z$ | 02 47 34 | 18-19 | | | | |
| | | $M_Z$ | 02 49 52 | 13 | | | 9.0mm. | |
| | | $F_Z$ | 03 50 (ca.) | | | | | |

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| DATE | ONSET | PHASE | TIME | PERIOD | AMPLITUDE | | | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | Ap | As | Ac | |
| Jan. 19 | Beginning. | Pg | 03 49 36 | 20-22 | | | | |
| | | Sg | 03 51 30 | 17 | | | 84.0mm. | |
| | | Pn | 03 52 10 (ca.) | | | | | |
| Jan. 25 | | Pg | 04 01 10 | | | | | Early minutes. |
| | | Sg | 04 03 40 | | | | | |
| | | Pn | 04 04 15 40 | | | | | |
| | | Pg | 04 06 00 | | | | | |
| | | Sg | 04 07 32 00 | | | | | |
| | | Pn | 04 08 04 | | | | | |
| | | | Start in aftershocks. | | | | | |
| Feb. 07 | | Pg | 20 09 17 | | | | | |
| | | Sg | 20 11 09 | | | | | |
| | | Pn | 20 11 49 | | | | | |
| | | Pg | 20 12 40 | | | | | |
| | | Sg | 20 14 25 | | | | | |
| | | Pn | 20 14 50 | | | | | |
| | | Pg | 20 15 32 | | | | | |
| | | Sg | 20 16 45 | | | | | |
| | | Pn | 20 17 00 | | | | | |
| | | Pg | 20 21 57 | | | | | |
| | | Sg | 20 23 50 | 5-6 | | | 87.7mm. | |
| | | Pn | 20 23 57 | | | | | |
| | | Pg | 20 24 25 | 4-5 | | | 105.0mm. | Off chart. |
| | | Sg | 20 26 (ca.) | | | | | |
| Feb. 25 | | Pg | 19 44 00 | | | | | Early minutes. |
| | | Sg | 19 49 10 | | | | | |
| | | Pn | 19 50 | | | | | |
| Mar. 05 | | Pg | 12 [illegible]. | S.M.S. | Readings checked by Professor [illegible]. | | | |
| | | Sg | 20 [illegible] | | | | | |
| Mar. 15 | | Pg | 20 16 32 | | | | | |
| | | Sg | 20 16 55 | | | | | |
| | | Pn | 20 17 15 | | | | | |
| | | Pg | 20 17 40 | | | | | |
| | | Sg | 20 18 05 | | | | | |
| | | Pn | 20 18 20 | | | | | |
| | | Pg | 20 19 00 | | | | | |
| | | Sg | 20 19 30 | | | | | |
| | | Pn | 20 19 45 | | | | | |
| | | Pg | 20 20 00 | | | | | |
| | | Sg | 20 20 35 | | | | | |
| | | Pn | 20 20 50 | | | | | |
| | | Pg | 20 21 05 | | | | | |
| | | Sg | 20 21 40 | | | | | |
| | | Pn | 20 21 55 | | | | | |
| | | Pg | 20 22 10 | | | | | |
| | | Sg | 20 22 45 | | | | | |
| | | Pn | 20 23 00 | | | | | |
| | | Pg | 20 23 15 | | | | | |
| | | Sg | 20 23 50 | | | | | |
| | | Pn | 20 24 05 | | | | | |
| | | Pg | 20 24 20 | | | | | |
| | | Sg | 20 24 55 | | | | | |
| | | Pn | 20 25 10 | | | | | |
| | | Pg | 20 25 25 | | | | | |
| | | Sg | 20 25 50 | | | | | |
| | | Pn | 20 26 05 | | | | | |
| | | Pg | 20 26 20 | | | | | |
| | | Sg | 20 26 55 | | | | | |
| | | Pn | 20 27 10 | | | | | |
| | | Pg | 20 27 25 | | | | | |
| | | Sg | 20 28 00 | | | | | |
| | | Pn | 20 28 15 | | | | | |
| | | Pg | 20 28 30 | | | | | |
| | | Sg | 20 29 05 | | | | | |
| | | Pn | 20 29 20 | | | | | |
| | | Pg | 20 29 35 | | | | | |
| | | Sg | 20 30 10 | | | | | |
| | | Pn | 20 30 25 | | | | | |
| | | Pg | 20 30 40 | | | | | |
| | | Sg | 20 31 15 | | | | | |
| | | Pn | 20 31 30 | | | | | |
| | | Pg | 20 31 45 | | | | | |
| | | Sg | 20 32 20 | | | | | |
| | | Pn | 20 32 35 | | | | | |
| | | Pg | 20 32 50 | | | | | |
| | | Sg | 20 33 25 | | | | | |
| | | Pn | 20 33 40 | | | | | |
| | | Pg | 20 33 55 | | | | | |
| | | Sg | 20 34 30 | | | | | |
| | | Pn | 20 34 45 | | | | | |
| | | Pg | 20 35 00 | | | | | |
| | | Sg | 20 35 35 | | | | | |
| | | Pn | 20 35 50 | | | | | |
| | | Pg | 20 36 05 | | | | | |
| | | Sg | 20 36 40 | | | | | |
| | | Pn | 20 36 55 | | | | | |
| | | Pg | 20 37 10 | | | | | |
| | | Sg | 20 37 45 | | | | | |
| | | Pn | 20 38 00 | | | | | |
| | | Pg | 20 38 15 | | | | | |
| | | Sg | 20 38 50 | | | | | |
| | | Pn | 20 39 05 | | | | | |
| | | Pg | 20 39 20 | | | | | |
| | | Sg | 20 39 55 | | | | | |
| | | Pn | 20 40 10 | | | | | |
| | | Pg | 20 40 25 | | | | | |
| | | Sg | 20 41 00 | | | | | |
| | | Pn | 20 41 15 | | | | | |
| | | Pg | 20 41 30 | | | | | |
| | | Sg | 20 42 05 | | | | | |
| | | Pn | 20 42 20 | | | | | |
| | | Pg | 20 42 35 | | | | | |
| | | Sg | 20 43 10 | | | | | |
| | | Pn | 20 43 25 | | | | | |
| | | Pg | 20 43 40 | | | | | |
| | | Sg | 20 44 15 | | | | | |
| | | Pn | 20 44 30 | | | | | |
| | | Pg | 20 44 45 | | | | | |
| | | Sg | 20 45 20 | | | | | |
| | | Pn | 20 45 35 | | | | | |
| | | Pg | 20 45 50 | | | | | |
| | | Sg | 20 46 25 | | | | | |
| | | Pn | 20 46 40 | | | | | |
| | | Pg | 20 46 55 | | | | | |
| | | Sg | 20 47 30 | | | | | |
| | | Pn | 20 47 45 | | | | | |
| | | Pg | 20 48 00 | | | | | |
| | | Sg | 20 48 35 | | | | | |
| | | Pn | 20 48 50 | | | | | |
| | | Pg | 20 49 05 | | | | | |
| | | Sg | 20 49 40 | | | | | |
| | | Pn | 20 49 55 | | | | | |
| | | Pg | 20 50 10 | | | | | |
| | | Sg | 20 50 45 | | | | | |
| | | Pn | 20 51 00 | | | | | |
| | | Pg | 20 51 15 | | | | | |
| | | Sg | 20 51 50 | | | | | |
| | | Pn | 20 52 05 | | | | | |
| | | Pg | 20 52 20 | | | | | |
| | | Sg | 20 52 55 | | | | | |
| | | Pn | 20 53 10 | | | | | |
| | | Pg | 20 53 25 | | | | | |
| | | Sg | 20 54 00 | | | | | |
| | | Pn | 20 54 15 | | | | | |
| | | Pg | 20 54 30 | | | | | |
| | | Sg | 20 55 05 | | | | | |
| | | Pn | 20 55 20 | | | | | |
| | | Pg | 20 55 35 | | | | | |
| | | Sg | 20 56 10 | | | | | |
| | | Pn | 20 56 25 | | | | | |
| | | Pg | 20 56 40 | | | | | |
| | | Sg | 20 57 15 | | | | | |
| | | Pn | 20 57 30 | | | | | |
| | | Pg | 20 57 45 | | | | | |
| | | Sg | 20 58 20 | | | | | |
| | | Pn | 20 58 35 | | | | | |
| | | Pg | 20 58 50 | | | | | |
| | | Sg | 20 59 25 | | | | | |
| | | Pn | 20 59 40 | | | | | |
| | | Pg | 21 00 00 | | | | | |
| | | Sg | 21 00 35 | | | | | |
| | | Pn | 21 00 50 | | | | | |
| | | Pg | 21 01 05 | | | | | |
| | | Sg | 21 01 40 | | | | | |
| | | Pn | 21 01 55 | | | | | |
| | | Pg | 21 02 10 | | | | | |
| | | Sg | 21 02 45 | | | | | |
| | | Pn | 21 03 00 | | | | | |
| | | Pg | 21 03 15 | | | | | |
| | | Sg | 21 03 50 | | | | | |
| | | Pn | 21 04 05 | | | | | |
| | | Pg | 21 04 20 | | | | | |
| | | Sg | 21 04 55 | | | | | |
| | | Pn | 21 05 10 | | | | | |
| | | Pg | 21 05 25 | | | | | |
| | | Sg | 21 06 00 | | | | | |
| | | Pn | 21 06 15 | | | | | |
| | | Pg | 21 06 30 | | | | | |
| | | Sg | 21 07 05 | | | | | |
| | | Pn | 21 07 20 | | | | | |
| | | Pg | 21 07 35 | | | | | |
| | | Sg | 21 08 10 | | | | | |
| | | Pn | 21 08 25 | | | | | |
| | | Pg | 21 08 40 | | | | | |
| | | Sg | 21 09 15 | | | | | |
| | | Pn | 21 09 30 | | | | | |
| | | Pg | 21 09 45 | | | | | |
| | | Sg | 21 10 20 | | | | | |
| | | Pn | 21 10 35 | | | | | |
| | | Pg | 21 10 50 | | | | | |
| | | Sg | 21 11 25 | | | | | |
| | | Pn | 21 11 40 | | | | | |
| | | Pg | 21 11 55 | | | | | |
| | | Sg | 21 12 30 | | | | | |
| | | Pn | 21 12 45 | | | | | |
| | | Pg | 21 13 00 | | | | | |
| | | Sg | 21 13 35 | | | | | |
| | | Pn | 21 13 50 | | | | | |
| | | Pg | 21 14 05 | | | | | |
| | | Sg | 21 14 40 | | | | | |
| | | Pn | 21 14 55 | | | | | |
| | | Pg | 21 15 10 | | | | | |
| | | Sg | 21 15 45 | | | | | |
| | | Pn | 21 16 00 | | | | | |
| | | Pg | 21 16 15 | | | | | |
| | | Sg | 21 16 50 | | | | | |
| | | Pn | 21 17 05 | | | | | |
| | | Pg | 21 17 20 | | | | | |
| | | Sg | 21 17 55 | | | | | |
| | | Pn | 21 18 10 | | | | | |
| | | Pg | 21 18 25 | | | | | |
| | | Sg | 21 19 00 | | | | | |
| | | Pn | 21 19 15 | | | | | |
| | | Pg | 21 19 30 | | | | | |
| | | Sg | 21 20 05 | | | | | |
| | | Pn | 21 20 20 | | | | | |
| | | Pg | 21 20 35 | | | | | |
| | | Sg | 21 21 10 | | | | | |
| | | Pn | 21 21 25 | | | | | |
| | | Pg | 21 21 40 | | | | | |
| | | Sg | 21 22 15 | | | | | |
| | | Pn | 21 22 30 | | | | | |
| | | Pg | 21 22 45 | | | | | |
| | | Sg | 21 23 20 | | | | | |
| | | Pn | 21 23 35 | | | | | |
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| | | Pg | 24 15 30 | | | | | |
| | | Sg | 24 16 05 | | | | | |
| | | Pn | 24 16 20 | | | | | |
| | | Pg | 24 16 35 | | | | | |
| | | Sg | 24 17 10 | | | | | |
| | | Pn | 24 17 25 | | | | | |
| | | Pg | 24 17 40 | | | | | |
| | | Sg | 24 18 15 | | | | | |
| | | Pn | 24 18 30 | | | | | |
| | | Pg | 24 18 45 | | | | | |
| | | Sg | 24 19 20 | | | | | |
| | | Pn | 24 19 35 | | | | | |
| | | Pg | 24 19 50 | | | | | |
| | | Sg | 24 20 25 | | | | | |
| | | Pn | 24 20 40 | | | | | |
| | | Pg | 24 20 55 | | | | | |
| | | Sg | 24 21 30 | | | | | |
| | | Pn | 24 21 45 | | | | | |
| | | Pg | 24 22 00 | | | | | |
| | | Sg | 24 22 35 | | | | | |
| | | Pn | 24 22 50 | | | | | |
| | | Pg | 24 23 05 | | | | | |
| | | Sg | 24 23 40 | | | | | |
| | | Pn | 24 23 55 | | | | | |
| | | Pg | 24 24 10 | | | | | |
| | | Sg | 24 24 45 | | | | | |
| | | Pn | 24 25 00 | | | | | |
| | | Pg | 24 25 15 | | | | | |
| | | Sg | 24 25 50 | | | | | |
| | | Pn | 24 26 05 | | | | | |
| | | Pg | 24 26 20 | | | | | |
| | | Sg | 24 26 55 | | | | | |
| | | Pn | 24 27 10 | | | | | |
| | | Pg | 24 27 25 | | | | | |
| | | Sg | 24 28 00 | | | | | |
| | | Pn | 24 28 15 | | | | | |
| | | Pg | 24 28 30 | | | | | |
| | | Sg | 24 29 05 | | | | | |
| | | Pn | 24 29 20 | | | | | |
| | | Pg | 24 29 35 | | | | | |
| | | Sg | 24 30 10 | | | | | |
| | | Pn | 24 30 25 | | | | | |
| | | Pg | 24 30 40 | | | | | |
| | | Sg | 24 31 15 | | | | | |
| | | Pn | 24 31 30 | | | | | |
| | | Pg | 24 31 45 | | | | | |
| | | Sg | 24 32 20 | | | | | |
| | | Pn | 24 32 35 | | | | | |
| | | Pg | 24 32 50 | | | | | |
| | | Sg | 24 33 25 | | | | | |
| | | Pn | 24 33 40 | | | | | |
| | | Pg | 24 33 55 | | | | | |
| | | Sg | 24 34 30 | | | | | |
| | | Pn | 24 34 45 | | | | | |
| | | Pg | 24 35 00 | | | | | |
| | | Sg | 24 35 35 | | | | | |
| | | Pn | 24 35 50 |

International Seismological Centre From the ISC collection scanned by SISMOS



January 1, to January 31, 1929.

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Jan. 26 | | $e_Z$ | 13 44 41 | | | | | P'Z? Heavy |
| | | $e_Z$ | 13 48 55 | | | | | $P_{R_1Z}$? |
| | | $e_Z$ | 13 58 52 | | | | | PSZ? |
| | | $e_Z$ | 14 04 54 | | | | | $S_{R_1Z}$? |
| | | $e_Z$ | 14 19 08 | | | | | |
| | | $e_Z$ | 14 25 03 | | | | | $e_{L_Z}$? |
| | | $M_Z$ | 14 40 24 | | | | 5.7mm. | |
| | | $F_Z$ | 15 47 (ca.) | | | | | |
| Jan. 26 | | $e_Z$? | 20 01 56 | | | | | Heavy micros. |
| | | $e_Z$ | 20 15 40 | | | | | |
| | | $e_Z$ | 20 31 26 | | | | | |
| | | $e_Z$ | 20 52 49 | | | | | |
| | | $e_{L_Z}$? | 20 59 20 | | | | | |
| | | $L_Z$ | 21 04 52 | 14 | | | | |
| | | $M_Z$ | 21 06 06 | 12-13 | | | 6.6mm. | |
| | | $F_Z$ | 21 45 (ca.) | | | | | |
| Jan. 27 | | $e_Z$ | 16 23 | | | | | Very difficul Extraordinary heavy micros, their amplitudes reachin 15 & 20 mm. |
| | | $e_Z$ | 16 27 | | | | | |
| | | $e_{L_Z}$ | 16 29 | | | | | |
| | | $L_Z$ | 16 31 | | | | | No distinct M |
| | | $F_Z$ | 17 12 | | | | | |
| Jan. 28 | | $e_Z$? | 21 50 | | | | | Very difficul Gram masked b extraordinary heavy micros. |
| | | $e_Z$? | 21 53 | | | | | |
| | | $e_Z$ | 22 10 | | | | | |
| | | $L_Z$ | 22 15 | | | | | |
| | | $M_Z$ | 22 16 04 | 11 | | | 15.8mm. | |
| | | $F_Z$ | 22 55 (ca.) | | | | | |
| Jan. 31 | | $e_{P_Z}$ | 18 11 36 | | | | | |
| | | $e_{P_{EN}}$ | 18 11 39 | | | | | |
| | | $P_{R_1Z}$ | 18 12 21 | | | | | |
| | | $e_{S_Z}$ | 18 16 54 | | | | | |
| | | $e_{S_Z}$ | 18 16 58 | | | | | |
| | | $e_{S_N}$ | 18 16 59 | | | | | |
| | | $i_Z$ | 18 17 20 | | | | | |
| | | $S_{R_1Z}$ | 18 18 44 | | | | | |
| | | $S_{R_1E}$ | 18 18 51 | | | | | |
| | | $S_{R_2Z}$ | 18 19 14 | | | | | |
| | | $S_{R_2E}$ | 18 19 20 | | | | | |
| | | $e_{L_Z}$ | 18 21 00 | | | | | |
| | | $L_Z$ | 18 22 34 | 17-18 | | | | |
| | | $M_Z$ | 18 24 49 | 12-13 | | | 42.5mm. | |
| | | $F_Z$ | 19 45 (ca.) | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS

UNIVERSITÉ DE STRASBOURG
Institut de
Physique du Globe

International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

## Seismological Bulletin

### of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Feb. 1 | | $e_Z$ | 17 27 51 | | | | | | |
| | | $i_Z$ | 17 31 50 | | | | | | |
| | | $i_N$ | 17 31 51 | | | | | | |
| | | $i_E$ | 17 31 54 | | | | | | |
| | | $i_Z$ | 17 32 48 | | | | | | |
| | | $i_Z$ | 17 34 04 | | | | | | |
| | | $S_Z$ | 17 38 10 | | | | | | |
| | | $e^S_{EN}$ | 17 38 11 | | | | | | |
| | | $M_E$ | 18 02 32 | | | | | | Drum of vertical component stopped since 17 hs. 55 ms. till 00 hs. 20 ms. |
| Feb. 2 | | $P_{EN}$ | 00 11 03 | | | | | | Vertical lost in changing sheet. |
| | | $S_N$ | 00 19 45 | | | | | | |
| | | $S_E$ | 00 19 46 | | | | | | |
| | | PS | 00 20 20 | | | | | | |
| | | $e^L_{NE}$ | 00 30 00 | | | | | | Possibly at 00.27 |
| Feb. 3 | | $e_Z$ | 03 08 00 | | | | | | Heavy and very troublesome micros. |
| | | $e_Z$ | 03 16 50 | | | | | | |
| | | $e_Z$ | 03 21 55 | | | | | | |
| | | $e_Z$ | 03 33 17 | | | | | | |
| | | $e_Z$ | 03 39 52 | | | | | | |
| | | $L_Z$ | 03 49 55 | | | | | | No distinct M. |
| | | $F_Z$? | | | | | | | Lost in micros |
| Feb. 3 | | $e_Z$ | 18 06 35 | | | | | | $P_Z$? Heavy micros. |
| | | $e_Z$ | 18 07 09 | | | | | | $PR_{1Z}$? |
| | | $e_Z$ | 18 11 21 | | | | | | $S_Z$? |
| | | $e^L_Z$? | 18 13 48 | | | | | | |
| | | $L_Z$ | 18 18 00 | | | | | | |
| | | $M_{1Z}$ | 18 19 05 | 13 | | | 11.2mm. | | |
| | | $M_{2Z}$ | 18 20 15 | 10 | | | 12.7mm. | | |
| | | $F_Z$ | 19 -5 (ca.) | | | | | | |
| Feb. 4 | | $e_Z$ | 06 55 59 | | | | | | |
| | | $F_Z$ | 07 07 | | | | | | |
| Feb. 4 | | $e_Z$ | 10 25 25 | | | | | | Heavy micros. |
| | | $e_Z$ | 10 26 16 | | | | | | |
| | | $e_Z$ | 10 31 47 | | | | | | |
| | | $e^L_Z$? | 10 33 54 | | | | | | |
| | | $L_Z$ | 10 36 45 | | | | | | |
| | | $M_Z$ | 10 40 00 | 11 | | | 10.0mm. | | |
| | | $F_Z$ | 11 12 (ca.) | | | | | | |
| Feb. 5 | | $e_Z$ | 03 59 13 | | | | | | Heavy micros. |
| | | $M_Z$ | 04 01 46 | 13 | | | 7.7mm. | | |
| | | $F_Z$ | 04 22 | | | | | | |
| Feb. 6 | | $e_Z$ | 02 15 15 | | | | | | |
| | | $e_Z$ | 02 35 02 | | | | | | |
| | | $e_Z$ | 02 45 30 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Feb. 6 | continued | $e_Z$ | 02 15 15 | | | | | |
| | | $e_Z$ | 02 35 02 | | | | | |
| | | $e_Z$ | 02 45 30 | | | | | |
| | | $e_Z$ | 02 58 27 | | | | | |
| | | $e_{L_Z}$? | 03 02 00 | | | | | Possibly sooner. |
| | | $L_Z$ | 03 18 35 | | | | | |
| | | $F_Z$ | 04 05 (ca.) | | | | | No distinct M. |
| Feb. 6 | | $P_Z$? | 07 02 00 | | | | | |
| | | $i_Z$ | 07 11 24 | | | | | |
| | | $e_{L_Z}$ | 07 22 10 | | | | | No distinct M. |
| | | $F_Z$ | 08 | | | | | |
| Feb. 8 | | $e_Z$ | 01 29 53 | | | | | P'$_Z$? Very troublesome. micros. |
| | | $e_Z$ | 01 31 40 | | | | | $P_{R_{1_Z}}$? |
| | | $e_Z$ | 01 33 40 | | | | | |
| | | $ve_Z$ | 01 45 01 | | | | | PS? |
| | | $e_{L_Z}$ | 02 16 19 | | | | | |
| | | $M_{1Z}$ | 02 23 55 | 14-15 | | | 16.4mm. | |
| | | $M_{2Z}$ | 02 25 20 | 11-12 | | | 15.9mm. | |
| | | $F_Z$ | 03 20 (ca.) | | | | | |
| Feb. 10 | | $e_Z$ | 03 43 21 | | | | | |
| | | $e_{L_Z}$ | 03 50 00 | 9 | | | | |
| | | $M_{1Z}$ | 03 55 46 | 17 | | | 9.0mm. | |
| | | $M_{2Z}$ | 03 57 48 | 11 | | | 10.3mm. | |
| | | $F_Z$ | 04 48 | | | | | |
| Feb. 10 | | $iP_Z$ | 15 45 07 | | | | | |
| | | $eP_{NE}$ | 15 45 15 | | | | | |
| | | $P_{R_{1_Z}}$ | 15 46 07 | | | | | |
| | | $P_{R_{1_{EN}}}$ | 15 46 13 | | | | | |
| | | $P_{R_{2_Z}}$ | 15 46 28 | | | | | |
| | | $S_Z$ | 15 50 22 | | | | | |
| | | $S_{EN}$ | 15 50 23 | | | | | |
| | | $S_{R_{1_Z}}$ | 15 51 58 | | | | | |
| | | $S_{R_{2_Z}}$ | 15 52 13 | | | | | |
| | | $S_{R_{2_E}}$ | 15 52 15 | | | | | |
| | | $e_{L_Z}$ | 15 53 06 | | | | | |
| | | $M_Z$ | 15 58 12 | 11-12 | | | 140.0+mm. | Off sheet. |
| | | $F_Z$ | 18 37 | | | | | |
| Feb. 11 | | $e_Z$ | 14 06 09 | | | | | |
| | | $e_Z$ | 14 19 54 | | | | | |
| | | $L_Z$ | 14 31 04 | 11 | | | | No distinct M. |
| | | $F_Z$ | 14 55 | | | | | |
| Feb. 13 | | $e_Z$ | 17 21 01 | | | | | |
| | | $e_Z$ | 17 23 45 | | | | | |
| | | $e_Z$ | 17 39 10 | | | | | |
| | | $L_Z$ | 18 06 18 | | | | | |
| | | $L_Z$ | 18 07 54 | 19 | | | | |
| | | $F_Z$ | 18 37 | | | | | |
| Feb. 13 | | $P_Z$ | 22 19 27 | | | | | |
| | | $P_{R_{1_Z}}$ | 22 20 19 | | | | | |
| | | $P_{R_{2_Z}}$ | 22 20 25 | | | | | |
| | | $S_Z$ | 22 24 07 | | | | | |
| | | $S_{R_{1_Z}}$ | 22 25 17 | | | | | |
| | | $S_{R_{2_Z}}$ | 22 25 42 | | | | | |
| | | $e_{L_Z}$ | 22 26 19 | | | | | |
| | | $M_Z$ | 22 32 29 | 13 | | | 17.8mm. | |
| | | $F_Z$ | 23 33 (ca.) | | | | | |
| Feb. 15 | | $i_Z$ | 06 02 10 | | | | | |
| | | $i_Z$ | 06 03 04 | | | | | |
| | | $e_{L_Z}$? | 06 13 11 | 8 | | | | |
| | | $F_Z$ | 06 34 | | | | | |
| Feb. 15 | | $P_Z$ | 08 10 42 | | | | | |
| | | $P_{R_{1_Z}}$ | 08 11 26 | | | | | |
| | | $S_Z$ | 08 15 52 | | | | | |
| | | $S_{R_{1_Z}}$ | 08 17 25 | | | | | |
| | | $S_{R_{2_Z}}$ | 08 18 05 | | | | | |
| | | $e_{L_Z}$ M | 08 18 23 | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | continued | | | | | | | |
| Feb. 15 | | $M_{1Z}$ | 08 24 05 | 13 | | | 35.3mm. | |
| | | $M_{2Z}$ | 08 27 33 | 12-13 | | | 39.4mm. | |
| | | $F_Z$ | 10 (ca.) | | | | | |
| Feb. 19 | | $e_Z$ | 05 51 17 | | | | | |
| | | $e_{L_Z}$? | 05 55 13 | | | | | |
| | | $L_Z$ | 05 59 53 | | | | | |
| | | $F_Z$ | 06 16 | | | | | |
| Feb. 22 | | $P_Z$ | 20 49 44 | | | | | |
| | | $P_{EN}$ | 20 49 46 | | | | | |
| | | $P_{R_{1EN}}$ | 20 51 22 | | | | | |
| | | $P_{R_{2E}}$ | 20 51 47 | | | | | |
| | | $P_{R_{2N}}$ | 20 51 49 | | | | | |
| | | $S_Z$ | 20 56 07 | | | | | |
| | | $S_{EN}$ | 20 56 10 | | | | | |
| | | $S_{R_{2Z}}$ | 20 59 34 | | | | | |
| | | $S_{R_{3Z}}$ | 20 59 54 | | | | | |
| | | $e_{L_{EN}}$ | 21 00 20 | | | | | |
| | | $e_{L_Z}$? | 21 01 31 | | | | | |
| | | $M_{1Z}$ | 21 05 44 | 13 | | | 131.0+mm. | Off scale. |
| | | $M_{2Z}$ | 21 08 49 | 15 | | | 120.0+mm. | Off scale. |
| | | $F_Z$ | 00 08 | | | | | |
| Feb. 26 | | $e_Z$? | 03 40 58 | | | | | Heavy micros. |
| | | $e_Z$ | 04 01 57 | | | | | |
| | | $e_Z$ | 04 21 35 | | | | | |
| | | $e_{L_Z}$ | 04 31 16 | | | | | |
| | | $L_Z$ | 04 36 08 | | | | | No distinct M. |
| | | $F_Z$ | 05 07 | | | | | |
| Feb. 26 | | $P_Z$ | 09 10 35 | | | | | |
| | | $P_{EN}$ | 09 10 39 | | | | | |
| | | $i_Z$ | 09 12 43 | | | | | |
| | | $P_{R_{1Z}}$ | 09 14 27 | | | | | |
| | | $S_Z$ | 09 18 23 | | | | | |
| | | $i_Z$ | 09 23 47 | | | | | |
| | | $e_{L_Z}$ | 09 29 13 | | | | | |
| | | $M_{1Z}$ | 09 36 33 | 11 | | | 24.5mm. | |
| | | $M_{2Z}$ | 09 39 00 | 13-14 | | | 43.5mm. | |
| | | $F_Z$ | 12 (ca.) | | | | | |
| Feb. 27 | | $e_Z$ | 20 09 15 | | | | | |
| | | $e_{L_Z}$ | 20 11 25 | | | | | |
| | | $F_Z$ | 20 35 (ca.) | | | | | |

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# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| March 1 | | $P_{EN}$ | 07 38 42 | | | | | | |
| | | $P_Z$ | 07 38 44 | | | | | | |
| | | $P_{R1_{EN}}$ | 07 40 06 | | | | | | |
| | | $P_{R1_Z}$ | 07 40 16 | | | | | | |
| | | $S_Z$? | 07 44 25 | | | | | | |
| | | $S_{EN}$ | 07 44 35 | | | | | | |
| | | $S_{R1_Z}$ | 07 47 10 | | | | | | |
| | | $S_{R1_{EN}}$ | 07 47 13 | | | | | | |
| | | $S_{R2_Z}$ | 07 47 50 | | | | | | |
| | | $S_{R2_{EN}}$ | 07 47 59 | | | | | | |
| | | $S_{R3_Z}$ | 07 48 33 | | | | | | |
| | | $_eL_{EN}$ | 07 49 15 | | | | | | |
| | | $_eL_Z$ | 07 50 09 | | | | | | |
| | | $M_{1Z}$ | 07 52 31 | 9-10 | | | 70.0+mm. | | Off scale. |
| | | $M_{2Z}$ | 07 56 16 | 12-13 | | | 140.0+mm. | | Off scale. |
| | | $F_Z$ | | | | | | | Lost in next quake. |
| March 1 | | $e_Z$ | 09 09 46 | | | | | | Earlier phases included in cauda of precedent quake. |
| | | $_eL_Z$ | 09 11 11 | | | | | | |
| | | $M_{1Z}$ | 09 14 53 | 8-9 | | | 15.0mm. | | |
| | | $M_{2Z}$ | 09 16 50 | 11-12 | | | 74.5mm. | | |
| | | $F_Z$ | 10 38 | | | | | | |
| March 1 | | $P_Z$ | 15 46 20 | | | | | | |
| | | $S_Z$ | 15 51 39 | | | | | | |
| | | $S_{R1_Z}$ | 15 53 36 | | | | | | |
| | | $M_{1Z}$ | 15 59 35 | 11-12 | | | 9.8mm. | | |
| | | $M_{2Z}$ | 15 60 32 | 11 | | | 19.2mm. | | |
| | | $F_Z$ | 17 00 (ca.) | | | | | | |
| March 1 | | $e_Z$? | 19 37 15 | | | | | | |
| | | $_eL_Z$ | 19 39 19 | | | | | | |
| | | $F_Z$ | 20 10 | | | | | | |
| March 1 | | $P_Z$ | 21 03 10 | | | | | | |
| | | $S_Z$ | 21 08 52 | | | | | | |
| | | $S_{R1_Z}$ | 21 11 08 | | | | | | |
| | | $_eL_Z$ | 21 14 44 | | | | | | |
| | | $M_Z$ | 21 17 54 | 10 | | | 8.4mm. | | |
| | | $F_Z$ | 21 55 | | | | | | |
| March 3 | | $P_Z$? | 09 20 30 | | | | | | |
| | | $P_{R1_Z}$? | 09 21 23 | | | | | | Heavy micros. |
| | | $P_{R2_Z}$? | 09 21 47 | | | | | | |
| | | $S_Z$ | 09 26 06 | | | | | | |
| | | $S_{R1_Z}$ | 09 27 32 | | | | | | |
| | | $S_{R2_Z}$ | 09 28 03 | | | | | | |
| | | $_eL_Z$ | 09 29 08 | | | | | | |
| | | $F_Z$ | 10 10 (ca.) | | | | | | No distinctM. |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Mar. 3 | | $e_Z$ | 16 59 39 | | | | | $P_Z$? Heavy micros. |
| | | $e_Z$ | 17 02 21 | | | | | |
| | | $S_Z$ | 17 04 40 | | | | | |
| | | $e_{L_Z}$? | 17 10 33 | | | | | Possibly |
| | | $M_Z$ | 17 11 40 | | | | 13.0mm. | sooner. |
| | | $F_Z$ | 17 57 (ca.) | | | | | |
| Mar. 3 | | $e_Z$ | 18 49 22 | | | | | Heavy micros. |
| | | $e_{L_Z}$ | 18 54 52 | | | | | |
| | | $F_Z$ | 19 26 (ca.) | | | | | |
| Mar. 7 | | $i_{P_Z}$ | 01 45 04 | | | | | Rest of phases in vertical are so heavy that their reading is impossible |
| | | $i_{P_{EN}}$ | 01 45 06 | | | | | |
| | | $P_{R_{1_{EN}}}$ | 01 47 55 | | | | | |
| | | $P_{R_{2_N}}$ | 01 49 11 | | | | | |
| | | $P_{R_{2_E}}$ | 01 49 12 | | | | | |
| | | $P_{R_{3_N}}$ | 01 49 33 | | | | | |
| | | $P_{R_{3_E}}$ | 01 49 34 | | | | | |
| | | $S_E$ | 01 53 30 | | | | | |
| | | $S_N$ | 01 53 33 | | | | | |
| | | $S_{R_{1_N}}$ | 01 58 38 | | | | | |
| | | $S_{R_{2_N}}$ | 02 00 51 | | | | | |
| | | $S_{R_{3_N}}$ | 02 01 42 | | | | | |
| | | $e_{L_{EN}}$ | 02 04 33 | | | | | |
| | | $M_{1N}$ | 02 07 29 | | | | | |
| | | $M_{2N}$ | 02 09 31 | | | | | |
| | | $M_{3N}$ | 02 10 49 | | | | | |
| | | $M_{4N}$ | 02 12 19 | | | | | |
| | | $M_{5N}$ | 02 15 12 | | | | | |
| | | $M_{6N}$ | 02 19 00 | | | | | |
| | | $F_Z$ | 08 00 (ca.) | | | | | |
| Mar. 9 | | $e_Z$ | 02 19 08 | | | | | Heavy micros. |
| | | $e_Z$ | 02 55 35 | | | | | |
| | | $e_Z$ | 02 37 02 | | | | | |
| | | $e_Z$ | 02 45 15 | | | | | |
| | | $e_{L_Z}$? | 02 58 39 | | | | | |
| | | $L_Z$ | 03 09 00 | 15 | | | | |
| | | $M_Z$ | 03 13 00 | | | | 7.5mm. | |
| | | $F_Z$ | 04 30 (ca.) | | | | | |
| Mar. 9 | | $P'_Z$? | 11 09 08 | | | | | |
| | | $i_Z$ | 11 12 32 | | | | | |
| | | $i_Z$ | 11 14 06 | | | | | |
| | | PS? | 11 22 05 | | | | | |
| | | $S_{R_1}$? $_Z$ | 11 27 55 | | | | | |
| | | $e_{L_Z}$ | 11 47 36 | | | | | |
| | | $M_{1Z}$ | 11 57 47 | 21 | | | 52.0mm. | |
| | | $M_{2Z}$ | 11 58 50 | 20-21 | | | 52.8mm. | |
| | | $M_{3Z}$ | 12 07 27 | 17-18 | | | 46.7mm. | |
| | | $F_Z$ | 14 30 (ca.) | | | | | |
| Mar. 10 | | $P'_Z$ | 14 49 38 | | | | | |
| | | $P_{R_{1Z}}$ | 14 53 33 | | | | | Possibly at 14-48-50. |
| | | PS? | 15 02 43 | | | | | |
| | | $e_{P_Z}$? | 15 28 12 | | | | | |
| | | $L_Z$ | 15 40 42 | | | | | |
| | | $F_Z$ | 16 32 (ca.) | | | | | No distinct M. |
| Mar. 10 | | $e_Z$? | 22 27 45 | | | | | |
| | | $e_Z$ | 22 47 12 | | | | | |
| | | $e_Z$ | 22 56 41 | | | | | |
| | | $e_Z$ | 23 01 11 | | | | | |
| | | $e_{L_Z}$? | 23 16 08 | | | | | |
| | | $L_Z$ | 23 23 24 | | | | | |
| | | $F_Z$ | 00 05 (ca.) | | | | | No distinct M. |
| Mar. 11 | | $e_Z$? | 13 21 43 | | | | | |
| | | $e_Z$? | 13 31 45 | | | | | |
| | | $e_Z$ | 13 38 09 | | | | | |
| | | $e_{L_Z}$ | 13 40 51 | | | | | |
| | | $F_Z$ | 14 29 (ca.) | | | | | No distinct M. |

International Seismological Centre From the ISC collection scanned by SISMOS



March 1 to March 31, 1929.

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Mar. 12 | | $e_Z$ | 02 45 29 | | | | | |
| | | $e_Z$ | 02 49 33 | | | | | |
| | | $i_Z$ | 02 56 48 | | | | | |
| | | $M_{1Z}$ | 03 02 08 | 11-12 | | | 6.5mm. | |
| | | $M_{2Z}$ | 03 03 09 | 8-9 | | | 7.8mm. | |
| | | $F_Z$ | 04 50 | | | | | |
| Mar. 13 | | $e_Z$ | 17 53 20 | | | | | |
| | | $e_Z$ | 17 55 12 | | | | | |
| | | $e_{L_Z}$? | 18 11 21 | | | | | |
| | | $L_Z$ | 18 15 36 | | | | | |
| | | $F_Z$ | 18 54 | | | | | No distinctM. |
| Mar. 15 | | $e_Z$? | 17 52 06 | | | | | Very trouble-some micros. |
| | | $e_Z$ | 17 59 05 | | | | | |
| | | $e_Z$ | 18 04 09 | | | | | |
| | | $e_{L_Z}$ | 18 10 48 | | | | | |
| | | $M_Z$ | 18 15 51 | 10-11 | | | 6.7mm. | |
| | | $F_Z$ | 18 54 | | | | | |
| Mar. 18 | | $e_{L_Z}$? | 02 44 10 | | | | | Heavy micros. |
| | | $L_Z$ | 02 50 44 | 9 | | | | |
| | | $F_Z$ | 03 17 | | | | | |
| Mar. 18 | | $e_Z$ | 14 40 47 | | | | | Very trouble-some micros. |
| | | $e_Z$ | 14 45 36 | | | | | |
| | | $e_Z$ | 15 07 12 | | | | | |
| | | $e_Z$ | 15 22 24 | | | | | |
| | | $e_Z$ | 15 31 55 | | | | | |
| | | $e_{L_Z}$? | 15 41 31 | | | | | Possibly much sooner. |
| | | $L_Z$ | 15 46 14 | | | | | No distinct M |
| | | $F_Z$ | 16 15 (ca.) | | | | | |
| Mar. 18 | | $L_Z$ | 00 23 42 | 8 | | | | Sheet down at 00- 00 - 01. |
| | | $F_Z$ | 00 41 | | | | | Early part of quake possi-bly lost. |
| Mar. 19 | | $e_Z$? | 09 42 25 | | | | | |
| | | $e_Z$ | 09 45 08 | | | | | |
| | | $i_Z$ | 09 46 07 | | | | | |
| | | $e_{L_Z}$? | 09 47 36 | | | | | |
| | | $M_Z$ | 09 47 58 | 11 | | | 6.7mm. | |
| | | $F_Z$ | 10 25 (ca.) | | | | | |
| Mar. 19 | | $P_Z$ | 20 59 43 | | | | | |
| | | $e_{P_N}$ | 20 59 46 | | | | | $P_E$ does not show. |
| | | $P_{R1_E}$ | 21 00 42 | | | | | |
| | | $P_{R2_N}$ | 21 01 01 | | | | | |
| | | $S_Z$ | 21 04 58 | | | | | |
| | | $S_N$ | 21 05 04 | | | | | |
| | | $S_{R1_Z}$ | 21 06 31 | | | | | |
| | | $S_{R2_Z}$ | 21 07 18 | | | | | |
| | | $e_{L_Z}$ | 21 07 53 | | | | | |
| | | $e_{L_N}$ | 21 08 09 | | | | | |
| | | $e_{L_E}$ | 21 08 12 | | | | | |
| | | $M_Z$ | 21 11 21 | 18 | | | 48.5mm. | |
| | | $M_{2Z}$ | 21 12 31 | 13 | | | 37.0mm. | |
| | | $M_{3Z}$ | 21 13 14 | 11 | | | 35.3mm. | |
| | | $F_Z$ | 23 05 | | | | | |
| Mar. 21 | | $i_{P_Z}$ | 02 42 57 | | | | | |
| | | $P_N$ | 02 43 01 | | | | | |
| | | $P_E$ | 02 43 02 | | | | | |
| | | $P_{R1_Z}$ | 02 43 51 | | | | | |
| | | $i_{S_Z}$ | 02 48 12 | | | | | |
| | | $S_{EN}$ | 02 48 16 | | | | | |
| | | $S_{R1_E}$ | 02 49 37 | | | | | |
| | | $S_{R1_Z}$ | 02 49 48 | | | | | |
| | | $S_{R2_N}$ | 02 50 20 | | | | | |
| | | $S_{R2_Z}$ | 02 50 31 | | | | | |
| | | $e_{L_Z}$ | 02 50 46 | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Mar. 21 | continued | $e_{LE}$ | 02 50 57 | | | | | |
| | | $e_{LN}$ | 02 51 16 | | | | | |
| | | $M_{1Z}$ | 02 55 37 | 13-14 | | | 69.0+mm. | Off scale. |
| | | $M_{2Z}$ | 02 56 11 | 12 | | | 75.0+mm. | Off scale. |
| | | $M_{3Z}$ | 02 57 41 | 12-13 | | | 82.0+mm. | Off scale. |
| | | $F_Z$ | 05 55 | | | | | |
| Mar. 22 | | $e_Z$? | 03 59 41 | | | | | |
| | | $e_Z$ | 04 05 09 | | | | | |
| | | $e_Z$ | 04 11 17 | | | | | |
| | | $e_{LZ}$ | 04 15 47 | | | | | No distinctM. |
| | | $F_Z$ | 04 32. | | | | | |
| Mar. 23 | | $e_Z$ | 11 48 06 | | | | | |
| | | $i_Z$ | 11 48 39 | | | | | |
| | | $e_{LZ}$ | 11 50 12 | | | | | |
| | | $M_Z$ | 11 51 36 | 11 | | | 15.4mm. | |
| | | $F_Z$ | 12 20 | | | | | |
| Mar. 23 | | P'Z? | 20 19 10 | | | | | |
| | | $P_{R_{1Z}}$ | 20 21 42 | | | | | |
| | | $e_Z$ | 20 33 08 | | | | | |
| | | $e_{LZ}$? | 21 05 24 | | | | | |
| | | $L_Z$ | 21 10 16 | | | | | |
| | | $M_Z$ | 21 16 19 | 18 | | | 4.3mm. | |
| | | $L_Z$ | 21 26 12 | | | | | |
| | | $L_Z$ | 21 29 36 | | | | | |
| | | $F_Z$ | 22 20 (ca.) | | | | | |
| Mar. 24 | | $e_Z$ | 06 02 49 | | | | | |
| | | $e_Z$ | 06 08 28 | | | | | |
| | | $e_Z$ | 06 21 12 | | | | | |
| | | $e_{LZ}$ | 06 32 39 | | | | | No distinctM. |
| | | $F_Z$ | 06 53 | | | | | |
| Mar. 26 | | $e_Z$? | 10 59 21 | | | | | Very difficult |
| | | $e_{LZ}$? | 11 02 08 | | | | | |
| | | $F_Z$ | 12 11 | | | | | |
| Mar. 26 | | $L_Z$ | 17 14 12 | | | | | Possibly earlier phases. |
| | | $F_Z$ | 17 22 (ca.) | | | | | Very heavy M. |
| Mar. 27 | | $e_Z$ | 22 12 53 | | | | | |
| | | $e_Z$ | 22 19 17 | | | | | |
| | | $e_Z$ | 22 26 18 | | | | | |
| | | $e_{LZ}$? | 22 30 50 | | | | | Possibly soon |
| | | $F_Z$ | 23 38 | | | | | No distinct M |
| Mar. 28 | | $P_Z$? | 03 16 35 | | | | | |
| | | $e_Z$ | 03 22 35 | | | | | |
| | | $e_{LZ}$ | 03 26 44 | | | | | |
| | | $M_Z$ | 03 33 09 | 9-10 | | | 5.3mm. | |
| | | $F_Z$ | 04 40 | | | | | |
| Mar. 28 | From 15.07 to | 22.42 | no record; light off. | | | | | |
| Mar. 30 | | $P_Z$? | 16 22 18 | | | | | |
| | | $S_Z$? | 16 27 47 | | | | | |
| | | $e_{LZ}$ | 16 30 56 | | | | | |
| | | $M_Z$ | 16 34 55 | 10 | | | 5.6mm. | |
| | | $F_Z$ | 16 58 | | | | | |
| Mar. 31 | | $e_Z$? | 03 06 58 | | | | | |
| | | $e_Z$ | 03 12 35 | | | | | |
| | | $e_Z$ | 03 21 12 | | | | | |
| | | $e_{LZ}$ | 03 41 33 | | | | | |
| | | $L_Z$ | 03 45 30 | | | | | No distinct : |
| | | $F_Z$ | 04 08 (ca.) | | | | | |
| Mar. 31 | | $e_Z$ | 05 50 45 | | | | | |
| | | $e_Z$ | 06 08 25 | | | | | |
| | | $e_Z$ | 06 17 35 | | | | | |
| | | $L_Z$ | 06 39 28 | 16 | | | 3.7mm. | |
| | | $F_Z$ | 07 20 (ca.) | | | | | |
| Mar. 31 | | $e_Z$ | 20 49 38 | | | | | |
| | | $e_Z$ | 20 54 38 | | | | | |
| | | $e_{LZ}$? | 21 11 27 | | | | | |
| | | $L_Z$ | 21 17 00 | 11 | | | | No distinct : |
| | | $F_Z$ | 22 18 | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Apr. 6 | | eZ? | 03 28 10 | | | | | | |
| | | eZ | 03 34 38 | | | | | | |
| | | eZ | 03 54 44 | | | | | | |
| | | eLZ | 04 16 51 | | | | | | |
| | | MZ | 04 20 04 | 9-10 | | | 4.9mm. | | |
| | | FZ | | | | | | | In next quake |
| Apr. 6 | | eZ? | 00 50 35 | | | | | | |
| | | eZ? | 00 56 01 | | | | | | |
| | | eZ? | 01 09 59 | | | | | | |
| | | eZ | 01 21 57 | | | | | | |
| | | LZ | 01 38 27 | | | | | | |
| | | MZ | 01 39 58 | 13 | | | 2.3mm. | | |
| | | FZ | 02 05 (ca.) | | | | | | |
| Apr. 6 | | eZ | 05 04 49 | | | | | | |
| | | eLZ? | 05 17 29 | | | | | | |
| | | iZ | 05 21 10 | | | | | | |
| | | iZ | 05 22 00 | | | | | | Possibly another shock |
| | | FZ | 05 52 | | | | | | |
| Apr. 7 | | PZ | 19 38 08 | | | | | | |
| | | $P_{R1Z}$ | 19 39 09 | | | | | | |
| | | SZ | 19 43 49 | | | | | | |
| | | $S_{R1Z}$ | 19 45 40 | | | | | | |
| | | $S_{R2Z}$ | 19 46 07 | | | | | | |
| | | $S_{R3Z}$ | 19 46 29 | | | | | | |
| | | eLZ | 19 47 08 | | | | | | |
| | | MZ | 19 51 40 | 14-15 | | | 31-9mm. | | |
| | | FZ | 21 28 | | | | | | |
| Apr. 8 | | PZ | 10 35 00 | | | | | | |
| | | iPR1Z | 10 37 26 | | | | | | |
| | | iZ | 10 39 14 | | | | | | |
| | | iZ | 10 41 27 | | | | | | |
| | | iZ | 10 43 16 | | | | | | |
| | | iZ | 10 46 24 | | | | | | |
| | | eLZ? | 10 48 07 | | | | | | |
| | | FZ | 12 (ca.) | | | | | | No distinct M. |
| Apr. 9 | | eZ? | 02 09 38 | | | | | | |
| | | eZ? | 02 16 39 | | | | | | Very difficult. Heavy micros. |
| | | eZ? | 02 24 17 | | | | | | |
| | | eZ | 02 43 41 | | | | | | |
| | | eZ | 02 51 02 | | | | | | |
| | | eLZ | 02 55 21 | | | | | | |
| | | MZ | 02 58 58 | 9-10 | | | 4.2mm. | | Possibly sooner. |
| | | FZ | 03 52 | | | | | | |
| Apr. 9 | | iZ | 04 12 25 | | | | | | |
| | | eLZ? | 04 15 45 | | | | | | Heavy micros. |
| | | LZ | 04 20 27 | | | | | | |
| | | FZ | | | | | | | No distinct M. In next quake. |
| Apr. 9 | | eZ | 05 01 41 | | | | | | |
| | | eLZ? | 05 06 13 | | | | | | |
| | | LZ | 05 12 53 | 9 | | | | | |
| | | FZ | 06 (ca.) | | | | | | No distinct M. |

International Seismological Centre From the ISC collection scanned by SISMOS



April 1 to April 30, 1929

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| April 10 | | $e_{Lz}$ | 06 20 37 | | | | | |
| | | $F_z$ | 06 27 | | | | | |
| April 10 | | $e_z$? | 09 27 15 | | | | | |
| | | $e_z$ | 09 32 46 | | | | | |
| | | $e_{Lz}$ | 09 39 27 | | | | | Possibly at 09-38-28 |
| | | $M_z$ | 09 41 38 | 11 | | | 5.0mm. | |
| | | $F_z$ | 10 02 | | | | | |
| April 10 | | $e_z$? | 13 07 33 | | | | | |
| | | $e_{Lz}$ | 13 34 45 | | | | | |
| | | $M_z$ | 13 36 49 | 7-8 | | | 2.5mm. | |
| | | $F_z$ | 13 47 | | | | | |
| April 10 | | $e_z$? | 18 06 45 | | | | | |
| | | $e_z$ | 18 20 57 | | | | | |
| | | $e_z$ | 18 28 48 | | | | | |
| | | $L_z$ | 18 36 50 | 12 | | | | |
| | | $M_z$ | 18 40 13 | 11 | | | 2.3mm. | |
| | | $L_z$ | 18 50 56 | 10-11 | | | | |
| | | $F_z$ | 19 30 | | | | | |
| April 13 | | $e_z$? | 06 38 30 | | | | | |
| | | $e_z$? | 06 48 47 | | | | | |
| | | $e_z$ | 06 57 49 | | | | | |
| | | $i_z$ | 07 02 43 | | | | | |
| | | $e_z$ | 07 10 19 | | | | | |
| | | $i_z$ | 07 20 06 | | | | | |
| | | $e_{Lz}$? | 07 35 39 | | | | | |
| | | $L_z$ | 07 39 55 | | | | | |
| | | $M_z$ | 07 44 18 | 17 | | | 2.4mm. | |
| | | $F_z$ | 08 38 (ca.) | | | | | |
| April 16 | | $e_z$ | 01 07 15 | | | | | Heavy micros. |
| | | $e_{Lz}$? | 01 10 50 | | | | | |
| | | $F_z$ | 02 (ca.) | | | | | |
| April 16 | | $e_z$ | 05 09 18 | | | | | Troublesome micros. |
| | | $e_z$ | 05 19 24 | | | | | |
| | | $e_z$ | 05 35 29 | | | | | |
| | | $e_{Lz}$ | 05 44 11 | | | | | Possibly sooner. |
| | | $F_z$ | 06 27 | | | | | |
| April 16 | | $e_z$ | 14 26 05 | | | | | No distinct M. |
| | | $F_z$ | 15 (ca.) | | | | | Possibly sooner. Very heavy micros. |
| April 19 | | $e_z$ | 04 09 36 | | | | | Heavy micros. |
| | | $e_z$ | 04 16 35 | | | | | |
| | | $e_z$ | 04 23 53 | | | | | |
| | | $e_z$ | 04 36 00 | | | | | |
| | | $e_{Lz}$ | 04 54 06 | | | | | |
| | | $F_z$ | 05 15 (ca.) | | | | | Possibly sooner. |
| April 19 | | $e_z$ | 21 01 37 | | | | | No distinct M. |
| | | $e_z$ | 21 07 47 | | | | | Possibly much sooner. Very troublesome micros. |
| | | $e_{Lz}$? | 21 15 31 | | | | | |
| | | $F_z$ | 21 58 (ca.) | | | | | |
| April 20 | | $e_{Lz}$? | 01 34 10 | | | | | No distinct M. |
| | | $L_z$ | 01 47 28 | | | | | |
| | | $F_z$ | 01 58 (ca.) | | | | | |
| April 21 | | $e_z$ | 12 30 37 | | | | | |
| | | $e_z$ | 12 44 22 | | | | | |
| | | $e_{Lz}$ | 12 52 53 | | | | | |
| | | $M_z$ | 12 57 29 | 8 | | | 4.1mm. | Possibly at 12-50-41 |
| | | $F_z$ | 13 48 | | | | | |
| April 22 | | $e_z$? | 00 28 01 | | | | | |
| | | $e_z$ | 00 40 40 | | | | | |
| | | $e_z$ | 00 46 16 | | | | | |
| | | $e_z$ | 00 49 59 | | | | | |
| | | $e_{Lz}$? | 00 59 16 | | | | | |
| | | $L_z$ | 01 11 50 | | | | | No distinct M. |
| | | $F_z$ | 01 41 | | | | | |
| April 22 | | $e_z$ | 21 16 12 | | | | | |
| | | $e_z$ | 21 20 38 | | | | | |
| | | $e_{Lz}$ | 21 21 44 | | | | | |
| | | $F_z$ | 21 29 | | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS



April 1 to April 30, 1929

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| April 23 | | $e_Z$? | 00 28 | | | | | |
| | | $e^L_Z$ | 01 07 26 | | | | | |
| | | $L_Z$ | 01 10 18 | | | | | |
| | | $F_Z$ | 01 30 | | | | | |
| April 23 | | $e_Z$ | 17 58 26 | | | | | |
| | | $e^L_Z$ | 18 06 40 | | | | | Possibly some |
| | | $M_Z$ | 18 08 53 | 9 | | | 4.0mm. | seconds sooner. |
| | | $F_Z$ | 18 32 (ca.) | | | | | |
| April 24 | | $e_Z$ | 02 06 13 | | | | | |
| | | $e_Z$ | 02 11 02 | | | | | |
| | | $e_Z$ | 02 22 11 | | | | | |
| | | $e_Z$ | 02 32 17 | | | | | |
| | | $e^L_Z$? | 02 51 52 | | | | | Possibly sooner. |
| | | $L_Z$ | 02 56 08 | | | | | No distinct M. |
| | | $F_Z$ | 03 24 (ca.) | | | | | |
| April 25 | | $e_Z$ | 09 02 21 | | | | | Heavy micros. |
| | | $e^L_Z$ | 09 03 56 | | | | | |
| | | $F_Z$ | 09 08 | | | | | |
| April 25 | | $e_Z$ | 09 52 59 | | | | | Heavy micros. |
| | | $e^L_Z$ | 09 59 51 | | | | | |
| | | $F_Z$ | 10 05 | | | | | |
| April 27 | | $P_Z$ | 11 47 27 | | | | | |
| | | $P_{R_1Z}$ | 11 48 23 | | | | | |
| | | $P_{R_2Z}$ | 11 48 43 | | | | | |
| | | $S_Z$ | 11 52 49 | | | | | |
| | | $S_{R_1Z}$ | 11 54 40 | | | | | |
| | | $S_{R_2Z}$ | 11 55 25 | | | | | |
| | | $e^L_Z$ | 11 55 59 | | | | | |
| | | $M_{1Z}$ | 12 00 05 | | | | | |
| | | $M_{2Z}$ | 12 01 30 | | | | | |
| | | $F_Z$ | 13 15 (ca.) | | | | | |
| April 27 | | $e_Z$ | 21 23 46 | | | | | Difficult. |
| | | $e_Z$ | 21 26 44 | | | | | |
| | | $e_Z$ | 21 46 18 | | | | | |
| | | $e_Z$ | 21 54 49 | | | | | |
| | | $e^L_Z$ | 22 10 24 | | | | | |
| | | $M_Z$ | 22 18 18 | | | | | |
| | | $F_Z$ | 23 33 | | | | | |
| April 29 | | $e_Z$ | 12 47 21 | | | | | Very difficult. |
| | | $e_Z$ | 12 51 16 | | | | | |
| | | $e_Z$ | 12 56 55 | | | | | |
| | | $e_Z$ | 13 02 58 | | | | | |
| | | $e_Z$ | 13 12 26 | | | | | $L_Z$? |
| | | $e_Z$ | 13 20 25 | | | | | |
| | | $e^L_Z$? | 13 25 17 | | | | | |
| | | $L_Z$ | 13 33 17 | | | | | |
| | | $F_Z$ | 14 09 | | | | | |
| April 29 | | $e_Z$ | 19 05 29 | | | | | |
| | | $e^L_Z$ | 19 12 50 | | | | | No distinct M. |
| | | $F_Z$ | 19 25 | | | | | |
| April 30 | | $e_Z$ | 18 51 36 | | | | | |
| | | $M_Z$ | 18 55 08 | 9 | | | 5.2mm. | |
| | | $F_Z$ | 19 16 | | | | | |
| April 30 | | $e_Z$ | 20 02 07 | | | | | |
| | | $e^L_Z$ | 20 11 11 | 12 | | | | |
| | | $F_Z$ | 20 35 (ca.) | | | | | |
| April 30 | | $e_Z$? | 23 55 55 | | | | | |
| | | $e^L_Z$ | 00 06 09 | | | | | |
| | | $F_Z$ | 00 22 | | | | | |

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# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 1 | | $e_Z$? | 07 58 10 | | | | | | |
| | | $e_Z$? | 07 59 17 | | | | | | |
| | | $e_Z$ | 08 03 44 | | | | | | |
| | | $e_Z$ | 08 07 47 | | | | | | |
| | | $e_Z$ | 08 08 57 | | | | | | |
| | | $e_{L_Z}$ | 08 34 52 | | | | | | |
| | | $M_Z$ | 08 41 03 | 21 | | | 3.8mm. | | |
| | | $M_{2Z}$ | 08 45 15 | 19 | | | 4.5mm. | | |
| | | $F_Z$ | 09 48 | | | | | | |
| May 1 | | $_iP_Z$ | 15 50 49 | | | | | | |
| | | $_eP_E$ | 15 50 51 | | | | | | |
| | | $P_{R_{1Z}}$ | 15 54 25 | | | | | | |
| | | $P_{R_{2Z}}$ | 15 56 25 | | | | | | |
| | | $P_{R_{2E}}$ | 15 56 25 | | | | | | |
| | | $_eS_E$ | 16 01 18 | | | | | | |
| | | $_iS_Z$ | 16 01 18 | | | | | | |
| | | $i_Z$ | 16 03 07 | | | | | | |
| | | $i_E$ | 16 03 11 | | | | | | |
| | | $S_{R_{1Z}}$ | 16 07 24 | | | | | | |
| | | $i_E$ | 16 08 18 | | | | | | |
| | | $S_{R_{2Z}}$ | 16 10 59 | | | | | | |
| | | $S_{R_{2E}}$ | 16 11 04 | | | | | | |
| | | $_eL_Z$? | 16 15 52 | | | | | | |
| | | $_eL_E$ | 16 16 31 | | | | | | |
| | | $M_{1E}$ | 16 26 11 | 22-23 | | 86.0mm. | | | |
| | | $M_{2E}$ | 16 29 22 | 19-20 | | 56.5mm. | | | |
| | | $M_{1Z}$ | 16 29 34 | 21 | | | 44.5mm. | | |
| | | $M_{3E}$ | 16 30 44 | 17-18 | | 60.6mm. | | | |
| | | $M_{4E}$ | 16 31 53 | 20 | | 96.0+mm. | | | Off sheet. |
| | | $M_{2Z}$ | 16 32 40 | 17-18 | | | 51.1mm. | | |
| | | $M_{3Z}$ | 16 35 02 | 18 | | | 87.5+mm. | | Off scale. |
| | | $M_{5E}$ | 16 35 12 | 16-17 | | 88.7+mm. | | | Off sheet. |
| | | $M_{4Z}$ | 16 36 55 | 15-16 | | | 79.0+mm. | | Off scale. |
| | | $M_{6E}$ | 16 36 55 | 15-16 | | 78.0mm. | | | |
| | | $F_Z$ | 20 15 | | | | | | |
| | | $F_E$ | 20 27 | | | | | | |
| May 1 | | $_eP_Z$ | 22 11 58 | | | | | | |
| | | $_iS_Z$ | 22 18 41 | | | | | | |
| | | $S_{R_{1Z}}$ | 22 22 13 | | | | | | |
| | | $_eL_Z$ | 22 24 46 | | | | | | |
| | | $M_Z$ | 22 31 22 | 17 | | | 2.4mm. | | |
| | | $F_Z$ | 22 25 (ea.) | | | | | | |

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May 1 to May 31, 1929

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| May 2 | | $iP_Z$ | 14 38 46 | | | | | |
| | | $P_{R1_Z}$ | 14 42 41 | | | | | |
| | | $S_Z$? | 15 49 55 | | | | | |
| | | $eL_Z$? | 15 08 05 | | | | | |
| | | $M_Z$ | 15 21 55 | 18 | | | 3.6mm. | |
| | | $F_Z$ | 16 25 | | | | | |
| May 3 | | $eZ$? | 01 00 02 | | | | | |
| | | $eZ$ | 01 29 40 | | | | | |
| | | $eL_Z$? | 01 43 07 | | | | | Possibly sooner. |
| | | $F_Z$ | | | | | | In next quake. |
| May 3 | | $eZ$ | 01 59 57 | | | | | |
| | | $eZ$ | 02 03 08 | | | | | |
| | | $eL_Z$? | 02 30 55 | | | | | |
| | | $M_Z$ | 02 40 13 | 8 | | | 2.3mm. | |
| | | $F_Z$ | 03 05 | | | | | |
| May 3 | | $eL_Z$? | 09 25 10 | | | | | Heavy micros. |
| | | $L_Z$ | 09 31 00 | | | | | |
| | | $F_Z$ | 09 40 | | | | | |
| May 3 | | $iZ$ | 14 29 52 | | | | | Heavy and troublesome micros. |
| | | $eZ$ | 14 38 17 | | | | | |
| | | $iZ$ | 14 48 38 | | | | | |
| | | $eZ$ | 14 57 05 | | | | | |
| | | $eL_Z$ | 15 12 14 | | | | | No distinct M. |
| | | $F_Z$ | 16 20 (ca.) | | | | | |
| May 5 | | $eZ$ | 05 52 14 | | | | | |
| | | $eZ$ | 05 59 05 | | | | | |
| | | $eL_Z$ | 06 05 54 | | | | | |
| | | $F_Z$ | 06 12 (ca.) | | | | | |
| May 5 | | $eZ$ | 17 19 23 | | | | | |
| | | $eZ$ | 17 24 38 | | | | | |
| | | $eZ$ | 17 28 16 | | | | | |
| | | $eZ$ | 17 36 11 | | | | | |
| | | $eL_Z$ | 18 05 35 | | | | | |
| | | $M_Z$ | 18 16 24 | | | | | |
| | | $F_Z$ | 19 00 (ca.) | | | | | |
| May 6 | | $eP_Z$ | 05 28 16 | | | | | |
| | | $iP_Z$ | 05 28 23 | | | | | |
| | | $P_{R1_Z}$ | 05 31 07 | | | | | |
| | | $iZ$ | 05 32 02 | | | | | |
| | | $eS_Z$ | 05 41 11 | | | | | |
| | | $iS_Z$ | 05 41 23 | | | | | |
| | | $S_{R1_Z}$ | 05 44 15 | | | | | |
| | | $eL_Z$ | 06 07 10 | | | | | |
| | | $M_{1Z}$ | 06 21 51 | 17 | | | 2.8mm. | |
| | | $M_{2Z}$ | 06 28 38 | 19 | | | 3.2mm. | |
| | | $F_Z$ | 07 48 | | | | | |
| May 7 | | $eP_Z$ | 16 53 43 | | | | | Possibly at 16-51-44. |
| | | $iZ$ | 16 57 13 | | | | | |
| | | $P_{R1_Z}$? | 16 58 02 | | | | | |
| | | $eL_Z$? | 17 36 02 | | | | | Possibly at 17-32-35. |
| | | $L_Z$ | 17 40 29 | | | | | |
| | | $M_Z$ | 17 45 00 | 22-23 | | | 15.5mm. | |
| | | $F_Z$ | 19 45 (ca.) | | | | | |
| May 8 | | $eZ$ | 13 23 00 | | | | | |
| | | $eL_Z$? | 13 44 48 | | | | | |
| | | $F_Z$ | 14 40 | | | | | |
| May 9 | | $eZ$ | 16 44 36 | | | | | |
| | | $eL_Z$ | 17 25 33 | | | | | Possibly sooner. |
| | | $L_Z$ | 17 29 49 | 16 | | | | |
| | | $F_Z$ | 18 10 | | | | | |
| May 10 | | $eZ$ | 12 42 46 | | | | | |
| May 10 | | $eZ$ | 17 38 52 | | | | | Rest of quake lost in changing of sheets off at 12-44. |
| | | $eL_Z$? | 17 50 35 | | | | | |
| | | $F_Z$ | 19 (ca.) | | | | | |
| May 11 | | $eZ$ | 19 34 42 | | | | | |
| | | $M_Z$ | 20 00 11 | 14 | | | 2.4mm. | |
| | | $F_Z$ | 20 13 | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE AN | AMPLITUDE AE | AMPLITUDE AZ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| May 25 | | eZ | 03 51 37 | | | | | |
| | | eLZ | 04 04 11 | | | | | No distinct M. |
| | | FZ | 04 27 (ca.) | | | | | |
| May 25 | | ePZ | 12 07 57 | | | | | |
| | | iPZ | 12 08 32 | | | | | |
| | | $PR_{1Z}$ | ?12 09 25 | | | | | |
| | | $PR_{2Z}$ | 12 10 12 | | | | | |
| | | $PR_{3Z}$ | 12 10 24 | | | | | |
| | | iSZ | 12 14 37 | | | | | |
| | | $SR_{1Z}$ | 12 17 48 | | | | | |
| | | $SR_{2Z}$ | 12 19 09 | | | | | |
| | | $SR_{3Z}$ | 12 19 24 | | | | | |
| | | eLZ | 12 20 46 | | | | | No distinct M. |
| | | FZ | 13 04 (ca.) | | | | | |
| May 26 | | PZ | 09 01 54 | | | | | |
| | | $PR_{2Z}$ | 09 09 48 | | | | | |
| | | SZ? | 09 14 51 | | | | | |
| | | PSZ | 09 16 44 | | | | | |
| | | eLZ | 09 42 38 | | | | | |
| | | MZ | 09 59 02 | 21-22 | | | 2.6mm. | |
| | | FZ | 11 | | | | | |
| May 26 | | eZ? | 12 59 11 | | | | | |
| | | eZ | 13 06 39 | | | | | |
| | | eLZ | 13 16 19 | | | | | Possibly at 13-14-28. |
| | | FZ | 13 27 (ca.) | | | | | |
| May 26 | | ePZ | 22 47 28 | | | | | |
| | | $PR_{1Z}$ | 22 49 13 | | | | | |
| | | $PR_{2Z}$ | 22 49 28 | | | | | |
| | | $PR_{3Z}$ | 22 50 00 | | | | | |
| | | eSZ | 22 53 49 | | | | | |
| | | $SR_{1Z}$ | 22 56 36 | | | | | |
| | | $SR_{2Z}$ | 22 57 08 | | | | | |
| | | $SR_{3Z}$ | 22 58 50 | | | | | |
| | | eLZ | 22 58 50 | | | | | |
| May 26 | | $M1_{EN}$ | 23 01 51 | | | | | The M phases are impossible to be read from the vertical. |
| | | $M2_{EN}$ | 23 02 49 | | | | | |
| | | $M3_{EN}$ | 23 04 48 | | | | | |
| | | $M4_{EN}$ | 23 05 50 | | | | | |
| | | FZ | 05 00 (ca.) | | | | | |
| May 27 | | SZ? | 05 33 17 | | | | | |
| | | eLZ | 05 38 11 | | | | | |
| | | M1Z | 05 42 30 | 22 | | | 4.5mm. | |
| | | M2Z | 05 47 50 | 13 | | | 3.8mm. | |
| | | FZ | | | | | | In following quake. Earlier phases included in cauda of preceding quake. |
| May 27 | | eLZ | 06 29 42 | | | | | |
| | | MZ | 06 33 27 | 7-8 | | | 5.0mm. | |
| | | FZ | 07 10 | | | | | |
| May 28 | | ePZ | 00 02 06 | | | | | |
| | | $PR_{1Z}$ | 00 03 23 | | | | | |
| | | SZ | 00 07 57 | | | | | |
| | | $SR_{1Z}$ | 00 10 20 | | | | | |
| | | $SR_{2Z}$ | 00 11 11 | | | | | |
| | | eLZ | 00 12 13 | | | | | |
| | | MZ | 00 16 37 | 11 | | | 20.0mm. | |
| | | FZ | 01 45 | | | | | |
| May 28 | | ePZ | 05 01 12 | | | | | |
| | | PSE | 05 11 17 | | | | | |
| | | eLE | 05 23 33 | | | | | |
| | | MZ | 05 33 00 | 20-21 | | | 2.5mm. | |
| | | FZ | 06 13 | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| May 28 | | $e_Z$ | 10 06 09 | | | | | |
| | | $e_{L_Z}$ | 10 13 42 | | | | | |
| | | $F_Z$ | 10 29 | | | | | |
| May 28 | | $e_Z$ | 17 02 21 | | | | | |
| | | $e_{L_Z}$ | 17 08 50 | | | | | |
| | | $F_Z$ | 17 27 | | | | | |
| May 29 | | $e_Z$? | 04 53 03 | | | | | |
| | | $e_Z$ | 04 56 18 | | | | | |
| | | $e_Z$ | 04 59 39 | | | | | |
| | | $e_{L_Z}$ | 05 01 28 | | | | | No distinct M. |
| | | $F_Z$ | 05 17 | | | | | |
| May 29 | | $e_Z$? | 13 23 05 | | | | | |
| | | $i_Z$ | 13 29 43 | | | | | Possibly $e_{L_Z}$. |
| | | $L_Z$ | 13 30 37 | 12-13 | | | | |
| | | $L_Z$ | 13 33 32 | 13 | | | | |
| | | $F_Z$ | 13 43 | | | | | |
| May 29 | | $e_Z$? | 14 27 06 | | | | | |
| | | $e_Z$ | 14 34 28 | | | | | |
| | | $e_Z$ | 14 35 25 | | | | | |
| | | $e_{L_Z}$ | 14 36 30 | | | | | |
| | | $M_Z$ | 14 38 43 | 11-12 | | | 5.8mm. | |
| | | $F_Z$ | 15 05 (ca.) | | | | | |
| May 29 | | $e_Z$ | 17 14 18 | | | | | |
| | | $e_Z$ | 17 20 15 | | | | | |
| | | $e_{L_Z}$ | 17 24 43 | | | | | |
| | | $F_Z$ | 17 40 | | | | | |
| May 30 | | $e_{L_Z}$ | 02 20 20 | | | | | |
| | | $L_Z$ | 02 23 13 | 10 | | | | |
| | | $F_Z$ | 02 25 | | | | | |
| May 30 | | $i_{P_{ZE}}$ | 09 55 03 | | | | | |
| | | $PS_{ZE}$ | 10 04 38 | | | | | |
| | | $e_{L_E}$ | 10 15 29 | | | | | |
| | | $M_{1Z}$ | 10 27 41 | 22 | | | 10.0mm. | |
| | | $M_{2Z}$ | 10 30 21 | 20 | | | 13.7mm. | |
| | | $F_Z$ | | | | | | In next quake. |
| May 30 | | $i_{P_Z}$ | 12 22 30 | | | | | |
| | | $PS_Z$ | 12 25 16 | | | | | |
| | | $M_{1Z}$ | 12 54 51 | 13 | | | 1.2mm. | |
| | | $F_Z$ | 14 45 | | | | | |
| May 31 | | $e_Z$ | 00 23 22 | | | | | |
| | | $e_{L_Z}$? | 00 59 00 | | | | | |
| | | $M_Z$ | 01 12 31 | 18 | | | 2.0mm. | |
| | | $F_Z$ | 01 54 | | | | | |

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Director.

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Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| June 1 | | $i_Z$ | 14 13 26 | | | | | | Very heavy micros. Difficult. ? |
| | | $i_Z$ | 14 17 25 | | | | | | |
| | | $e_{L_Z}$ | 14 21 24 | | | | | | |
| | | $L_Z$ | 14 24 20 | 8 | | | | | |
| | | $F_Z$ | 15 10 | | | | | | |
| June 1 | | $e_Z$ | 18 51 10 | | | | | | Possibly sooner. Very heavy micros. |
| | | $e_Z$ | 18 59 52 | | | | | | |
| | | $e_{L_Z}$ | 19 07 28 | | | | | | |
| | | $L_Z$ | 19 09 16 | 16 | | | | | |
| | | $F_Z$ | 19 31 | | | | | | |
| June 2 | | $iP_Z$ | 21 51 49 | | | | | | |
| | | $iPR_{1Z}$ | 21 56 00 | 13 | | | | | |
| | | $PS_Z$ | 22 05 31 | | | | | | ? |
| | | $e_{L_Z}$ | 22 26 55 | | | | | | |
| | | $M_Z$ | 22 36 20 | | | | 3.1mm. | | |
| | | $F_Z$ | 23 50 | | | | | | |
| June 3 | | $P_Z$ | 20 43 03 | | | | | | ? |
| | | $S_Z$ | 20 55 15 | | | | | | ? |
| | | $e_{L_Z}$ | 21 18 12 | | | | | | |
| | | $M_Z$ | 21 20 16 | 13 | | | 3.7mm. | | |
| | | $F_Z$ | 23 (ca.) | | | | | | |
| June 4 | | $L_Z$ | 12 55 25 | ? | | | | | |
| | | $F_Z$ | 13 10 | | | | | | Sheets put on at 12hrs. 50 m. |
| June 4 | | $i_Z$ | 15 34 33 | | | | | | Heavy micros. |
| | | $i_Z$ | 15 37 17 | | | | | | $P_Z$? |
| | | $e_{L_Z}$ | 15 50 33 | 10 | | | | | $P_{R1Z}$? |
| | | $L_Z$ | 16 02 08 | 9 | | | | | No distinct M. |
| | | $F_Z$ | 17 15 | | | | | | Heavy micros. |
| June 6 | | $e_Z$ | 16 40 12 | | | | | | |
| | | $L_Z$ | 16 51 | 26 | | | | | |
| | | $M1_Z$ | 16 53 14 | 27 | | | 1.9mm. | | |
| | | $M2_Z$ | 16 56 48 | 27 | | | 3.1mm. | | |
| | | F | 17 57 | | | | | | |
| June 6 | | $iP_{ENZ}$ | 11 01 24 | | | | | | |
| | | $S_{ENZ}$ | 11 10 39 | | | | | | |
| | | $PS_{EN}$ | 11 11 16 | | | | | | |
| | | $S_{R1EN}$ | 11 16 38 | | | | | | |
| | | $S_{R2EN}$ | 11 18 41 | | | | | | |
| | | $S_{R3EN}$ | 11 19 55 | | | | | | |
| | | $e_{L_{EN}}$ | 11 22 14 | | | | | | |
| | | $M_Z$ | 11 31 23 | 16 | | | 7.3mm. | | |
| | | F | | | | | | | Sheets taken off before quake had ended. |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| June 6 | | $P_Z$ | 14 38 28 | | | | | |
| | | $PR_{1Z}$ | 14 41 56 | | | | | |
| | | $L_Z$ | 15 33 42 | 9 | | | | |
| | | $F_Z$ | 16 26 | | | | | |
| June 7 | | $e_Z$ | 00 37 52 | | | | | Sheets off at 00Hrs.42m. |
| June 8 | | $e_Z$ | 17 47 | | | | | Possibly sooner. |
| | | $eL_Z$ | 18 14 21 | | | | | |
| | | $L_Z$ | 18 18 21 | 18 | | | | |
| | | $M_Z$ | 18 20 42 | 11 | | | 2.2mm. | |
| | | $F_Z$ | 19 10 | | | | | |
| June 9 | | $e_Z$ | 01 05 29 | | | | | |
| | | $e_Z$ | 01 10 01 | | | | | Difficult. |
| | | $eL_Z$ | 01 14 54 | | | | | |
| | | $M_Z$ | 01 22 23 | 12-13 | | | 5.6mm. | |
| | | F | 02 (ca.) | | | | | |
| June 9 | | $e_Z$ | 23 57 51 | | | | | |
| | | $L_Z$ | 00 07 22 | 13-14 | | | | |
| | | $L_Z$ | 00 18 12 | 12 | | | | |
| | | F | | | | | | Sheets off at 00hrs.20m. Quake still on. |
| | | $e_Z$ | 00 03 19 | | | | | Possibly sooner |
| | | $e_Z$ | 07 08 54 | | | | | Heavy micros. |
| | | $e_Z$ | 07 10 18 | | | | | |
| | | $eL_Z$ | 07 11 58 | | | | | ? |
| | | $L_Z$ | 07 13 07 | 11 | | | | No distinct M. |
| | | $F_Z$ | 07 35 | | | | | |
| June 9 | | $P_Z$ | 08 18 02 | | | | | |
| | | $PR_{1Z}$ | 08 19 56 | | | | | |
| | | $S_Z$ | 08 25 03 | | | | | |
| | | $SR_{1Z}$ | 08 28 52 | | | | | |
| | | $eL_Z$ | 08 32 11 | | | | | |
| | | $i_Z$ | 08 34 12 | | | | | Striking change in period. |
| | | $M_Z$ | 08 37 57 | 9 | | | 23.0mm. | |
| | | $F_Z$ | In following quake. | | | | | |
| June 9 | | $iP_Z$ | 09 20 33 | | | | | |
| | | $PR_{1Z}$ | 09 24 19 | | | | | |
| | | $PR_{2Z}$ | 09 26 42 | | | | | ? |
| | | $S_Z$ | 09 31 02 | | | | | |
| | | $PS_Z$ | 09 31 56 | | | | | |
| | | $SR_{1Z}$ | 09 37 07 | | | | | |
| | | $SR_{2Z}$ | 09 43 11 | | | | | |
| | | $SR_{3Z}$ | 09 48 03 | | | | | |
| | | $eL_Z$ | 09 48 03 | | | | | |
| | | $L_Z$ | 09 53 11 | | | | | |
| | | $M_{1Z}$ | 09 58 58 | 23 | | | 10.3mm. | |
| | | $M_{2Z}$ | 10 00 33 | 16 | | | 9.9mm. | |
| | | $M_{3Z}$ | 10 01 31 | 15 | | | 13.4mm. | |
| | | $M_{4Z}$ | 10 06 03 | 13-14 | | | 12.2mm. | |
| | | $M_{5Z}$ | 10 07 04 | 14 | | | 16.4mm. | |
| | | $M_{6Z}$ | 10 10 46 | 13-14 | | | 16.4mm. | |
| | | $F_Z$ | Sheets off at 13 hrs. 10 m. Quake still on. | | | | | |
| June 10 | | $P_Z$ | 23 12 36 | | | | | |
| | | $PR_{1Z}$ | 23 14 47 | | | | | |
| | | $PR_{3Z}$ | 23 16 00 | | | | | |
| | | $S_Z$ | 23 20 00 | | | | | |
| | | $PS_Z$ | 23 20 23 | | | | | |
| | | $SR_{1Z}$ | 23 23 36 | | | | | ? |
| | | $SR_{2Z}$ | 23 25 06 | | | | | |
| | | $eL_Z$ | 23 28 10 | | | | | |
| | | $M1_Z$ | 23 34 52 | 12-13 | | | 9.0mm. | |
| | | $M_{2Z}$ | 23 35 50 | 12 | | | 12.0mm. | |
| | | $F_Z$ | | | | | | Sheets off at 00 hrs.23m. Quake still on. |

International Seismological Centre From the ISC collection scanned by SISMOS



| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| June 19 | continued | $M_{2_Z}$ | 09 04 29 | 12 | | | 2.3mm. | |
| | | $M_{3_Z}$ | 09 06 42 | 14 | | | 2.7mm. | |
| | | $F_Z$ | 10 04 | | | | | |
| June 20 | | $L_Z$ | 12 37 21 | 11 | | | | Sheets down at 12hrs.37m. 11 sec.Quake then on. |
| | | $F_Z$ | 12 58 | | | | | |
| June 20 | | $i P'_Z$ | 18 42 18 | | | | | |
| | | $i_Z$ | 18 44 37 | | | | | |
| | | $L_Z$ | 19 57 to 20 03 | | | | | Very small amplitudes. |
| | | $F_Z$ | 21 10 | | | | | |
| June 20 | | $e_Z$ | 21 34 54 | | | | | |
| | | $F_Z$ | 21 53 | | | | | No phases clear. |
| June 22 | | $P'_Z$ | 15 49 23 | | | | | |
| | | $i_Z$ | 15 51 26 | | | | | |
| | | $e S_Z$ | 16 01 37 | | | | | ? |
| | | $PS_Z$ | 16 02 58 | | | | | ? |
| | | $e L_Z$ | 16 23 41 | | | | | |
| | | $M_{1_Z}$ | 16 37 21 | 19-20 | | | 5.0mm. | |
| | | $M_{2_Z}$ | 16 41 57 | 17 | | | 3.5mm. | |
| | | $M_{3_Z}$ | 16 45 17 | 16-17 | | | 5.7mm. | |
| | | $M_{4_Z}$ | 16 51 34 | 16 | | | 5.6mm. | |
| | | $F_Z$ | 18 47 | | | | | |
| June 22 | | $e_Z$ | 22 53 59 | | | | | |
| | | $e L_Z$ | 23 00 12 | | | | | |
| | | $F_Z$ | 23 18 | | | | | |
| June 22 | | $e P_Z$ | 18 58 17 | | | | | Possibly at 18hrs.57min. 42 sec. |
| | | $i_Z$ | 19 00 23 | | | | | |
| | | $PS_Z$ | 19 11 22 | | | | | |
| | | $M_{1_Z}$ | 19 47 38 | 19-20 | | | 1.6mm. | |
| | | $M_{2_Z}$ | 19 51 58 | 17-18 | | | 1.8mm. | |
| | | $M_{3_Z}$ | 19 55 00 | 17 | | | 2.0mm. | |
| | | $M_{4_Z}$ | 19 59 [illegible] | 14-15 | | | 2.4mm. | |
| | | $F_Z$ | 21 18 | | | | | |
| June 23 | | $e_Z$ | 03 59 39 | | | | | |
| | | $L_Z$ | 04 04 11 | 9 | | | | |
| | | $L_Z$ | 04 07 15 | 10 | | | | |
| | | $F_Z$ | 04 13 | | | | | |
| June 23 | | $e_Z$ | 06 48 41 | | | | | |
| | | $e L_Z$ | 06 58 38 | | | | | |
| | | $L_Z$ | 06 59 19 | 13 | | | | |
| | | $F_Z$ | 07 20 | | | | | |
| June 23 | | $e_Z$ | 22 55 14 | | | | | |
| | | $L_Z$ | 23 07 04 | 14 | | | | |
| | | $L_Z$ | 23 10 10 | 18 | | | | |
| | | $F_Z$ | 23 44 | | | | | |
| June 24 | | $P_Z$ | 18 17 15 | | | | | |
| | | $S_Z$ | 18 27 30 | | | | | ? |
| | | $e L_Z$ | 18 41 40 | | | | | |
| | | $L_Z$ | 18 44 11 | 9 | | | | |
| | | $M_{1_Z}$ | 18 53 17 | 8 | | | 3.7mm. | |
| | | $M_{2_Z}$ | 19 00 21 | 9-10 | | | 2.8mm. | |
| | | $F_Z$ | 19 20 | | | | | |
| June 25 | | $e_Z$ | 06 40 11 | | | | | Micros very heavy. |
| | | $L_Z$ | 06 45 21 | 9 | | | | |
| | | $L_Z$ | 07 04 17 | 9 | | | | |
| | | $F_Z$ | 07 18 | | | | | |
| June 25 | | $e_Z$ | 09 35 27 | | | | | Micros very heavy. |
| | | $e_Z$ | 09 41 15 | | | | | |
| | | $e L_Z$ | 09 47 31 | | | | | ? |
| | | $L_Z$ | 09 55 32 | 12 | | | | |
| | | $L_Z$ | 09 58 18 | 14 | | | | |
| | | $F_Z$ | 10 30 | | | | | |
| June 26 | | $e P_Z$ | 06 40 42 | | | | | ? |
| | | $e L_Z$ | 07 06 37 | | | | | ? |
| | | $L_Z$ | 07 10 13 | 16 | | | | |
| | | $M_Z$ | 07 14 19 | 14 | | | 7.5mm. | |
| | | $F_Z$ | 08 27 | | | | | |
| June 26 | | $e_Z$ | 17 39 15 | | | | | |
| | | $L_Z$ | 17 55 13 | 8 | | | | Micros make readings uncertain. |
| | | $L_Z$ | 18 06 13 | 8 | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS



| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| June 27 | | $P_{EN}$ | 13 01 19 | | | | | |
| | | $PS_{EN}$ | 13 14 37 | | | | | Lost on vertical. |
| | | $S_{P_1EN}$ | 13 20 55 | | | | | Light off. |
| | | $e_{L_{EN}}$ | 13 35 37 | | | | | |
| | | $M_E$ | 13 46 30 | 20 | | 1.0mm. | | |
| | | $M_N$ | 13 48 26 | 19 | 0.8mm. | | | |
| | | $F_{EN}$ | 17 40 | | | | | |
| June 28 | | $e_Z$ | 02 04 34 | | | | | |
| | | $L_Z$ | 02 09 30 | 18 | | | | |
| | | $F_Z$ | 02 31 | | | | | |
| June 28 | | $e_Z$ | 09 14 | | | | | |
| | | $L_Z$ | 09 18 12 | 12 | | | | |
| | | $F_Z$ | 09 25 | | | | | |
| June 30 | | $e_Z$ | 03 03 57 | | | | | |
| | | $P_{R_1Z}$ | 03 06 09 | | | | | ? |
| | | PS | 03 15 47 | | | | | ? |
| | | $e_{L_Z}$ | 03 39 15 | | | | | |
| | | $L_Z$ | 03 50 23 | 11 | | | | |
| | | $L_Z$ | 04 01 34 | 16 | | | | |
| | | $M1_Z$ | 04 08 44 | 17 | | | 4.4mm. | |
| | | $M2_Z$ | 04 11 04 | 17 | | | 7.6mm. | |
| | | $M3_Z$ | 04 18 01 | 17 | | | 6.8mm. | |
| | | $M4_Z$ | 04 21 36 | 16 | | | 6.8mm. | |
| | | $F_Z$ | In next quake. | | | | | |
| June 30 | | $e_Z$ | 06 24 04 | | | | | |
| | | $e_{L_Z}$ | 06 33 15 | | | | | ? |
| | | $L_Z$ | 06 37 20 | 13 | | | | |
| | | $L_Z$ | 06 39 20 | 16 | | | | |
| | | $F_Z$ | 07 14 | | | | | |

Francis A. Tondorf, S. J.,
Director.

International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| July 1 | | $e_Z$ | 12 31 | | | | | | |
| | | $e_{L_Z}$ | 12 23 31 | | | | | | |
| | | $L_Z$ | 12 25 19 | 13 | | | | | |
| | | $F_Z$ | 12 37 | | | | | | |
| July 2 | | $e_Z$ | 03 06 12 | | | | | | Micros heavy. |
| | | $e_{L_Z}$ | 03 17 09 | 12 | | | | | |
| | | $F_Z$ | 03 39 | | | | | | |
| July 2 | | $e_{L_Z}$ | 01 58 16 | | | | | | Micros heavy. |
| | | $L_Z$ | 02 03 13 | 8-9 | | | | | |
| | | $F_Z$ | 02 05 | | | | | | |
| July 2 | | $e_{L_Z}$ | 16 05 | | | | | | |
| | | $L_Z$ | 16 09 36 | 17 | | | | | |
| | | $L_Z$ | 16 15 00 | 17 | | | | | |
| | | $F_Z$ | 16 37 | | | | | | |
| July 3 | | $iP_Z$ | 01 01 40 | | | | | | |
| | | $iPR_{Z_2}$ | 01 04 03 | | | | | | |
| | | $iS_Z$ | 01 07 27 | | | | | | |
| | | $e_{L_Z}$ | 01 13 05 | | | | | | |
| | | $M_{1_Z}$ | 01 18 40 | 9 | | | 17.0mm. | | |
| | | $M_{2_Z}$ | 01 22 05 | 7 | | | 10.2mm. | | |
| | | $M_{3_Z}$ | 01 24 31 | 7 | | | 8.2mm. | | |
| | | $F_Z$ | 02 05 | | | | | | |
| July 3 | | $e_Z$ | 18 50 | | | | | | Possibly sooner. |
| | | $e_{L_Z}$ | 18 56 03 | ? | | | | | |
| | | $L_Z$ | 19 00 27 | 15 | | | | | |
| | | $M_Z$ | 19 06 33 | 19 | | | 2.6mm. | | |
| | | $F_Z$ | 19 59 | | | | | | |
| July 3 | | $e_{L_Z}$? | 21 10 07 | | | | | | |
| | | $L_Z$ | 21 12 05 | 12 | | | | | |
| | | $F_Z$ | 21 21 | | | | | | |
| July 4 | | $e_{P_Z}$ | 04 37 14 | | | | | | |
| | | $e_{S_Z}$ | 04 44 08 | | | | | | |
| | | $S_{R_{1_Z}}$ | 04 47 41 | | | | | | |
| | | $e_{L_Z}$ | 04 49 47 | | | | | | |
| | | $M_{1_Z}$ | 04 54 10 | 7 | | | 34.3mm. | | |
| | | $M_{2_Z}$ | 04 57 15 | 10 | | | 26.2mm. | | |
| | | F | 05 57 | | | | | | |
| July 4 | | $e_{L_Z}$ | 07 26 | | | | | | |
| | | $L_Z$ | 07 32 41 | 19 | | | | | |
| | | $M_Z$ | 07 34 06 | 13 | | | 3.0mm. | | |
| | | $F_Z$ | In next quake. | | | | | | |
| July 4 | | $e_{L_Z}$? | 07 40 24 | | | | | | |
| | | $L_Z$ | 07 50 45 | 11-12 | | | | | |
| | | F | 08 07 | | | | | | |
| July 4 | | $e_{L_Z}$ | 08 14 55 | | | | | | |
| | | $L_Z$ | 08 16 28 | 11-12 | | | | | |
| | | $F_Z$ | 08 58 | | | | | | |
| July 4 | | $e_Z$ | 10 51 08 | | | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS

No. 19

# Washington, D. C.

## Seismological Bulletin

of the Georgetown University Department of Geology

Instruments: Acacia pendulums after Wenner, 25 kg. (Geiger), 80 kg. (Galitzin). Period: 135 sec. two Bosch-Omori pendulums 25 kg. and two Bosch-Omori pendulums 80 kg. (Galitzin). Magnification: 2000 (Galitzin), 1000 (Geiger). Damping: Acacia pendulums 25 kg. (Geiger) 2 to 3 swings, Acacia pendulums 80 kg. (Galitzin) 20 swings.

From September 1 to September 30, 1939

Station: Georgetown University Observatory, Washington, D. C. $\varphi = 38°\ 54'\ 23''\ N$ $\lambda = 77°\ 4'\ 24''\ W$ $h = 124$ m

Observer: Father Paul J. Heinrich, S.J.

### Soil, Decayed Diorite

Seismic pendulums after Mainka. (Horizontal) 200 gms.

| | | |

International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

## Seismological Bulletin

### of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| July 1 | | $e_Z$ | 12 31 | | | | | | |
| | | $e_{L_Z}$ | 12 23 31 | | | | | | |
| | | $L_Z$ | 12 25 19 | 13 | | | | | |
| | | $F_Z$ | 12 37 | | | | | | |
| July 2 | | $e_Z$ | 03 06 12 | | | | | | Micros heavy. |
| | | $e_{L_Z}$ | 03 17 09 | 12 | | | | | |
| | | $F_Z$ | 03 39 | | | | | | |
| July 2 | | $e_{L_Z}$ | 01 58 16 | | | | | | Micros heavy. |
| | | $L_Z$ | 02 03 13 | 8-9 | | | | | |
| | | $F_Z$ | 02 05 | | | | | | |
| July 2 | | $e_{L_Z}$ | 16 05 | | | | | | |
| | | $L_Z$ | 16 09 36 | 17 | | | | | |
| | | $L_Z$ | 16 15 00 | 17 | | | | | |
| | | $F_Z$ | 16 37 | | | | | | |
| July 3 | | $iP_Z$ | 01 01 40 | | | | | | |
| | | $iPR_{Z_2}$ | 01 04 03 | | | | | | |
| | | $iS_Z$ | 01 07 27 | | | | | | |
| | | $e_{L_Z}$ | 01 13 05 | | | | | | |
| | | $M_{1_Z}$ | 01 18 40 | 9 | | | 17.0mm. | | |
| | | $M_{2_Z}$ | 01 22 05 | 7 | | | 10.2mm. | | |
| | | $M_{3_Z}$ | 01 24 31 | 7 | | | 8.2mm. | | |
| | | $F_Z$ | 02 05 | | | | | | |
| July 3 | | $e_Z$ | 18 50 | | | | | | Possibly sooner. |
| | | $e_{L_Z}$ | 18 56 03 | ? | | | | | |
| | | $L_Z$ | 19 00 27 | 15 | | | | | |
| | | $M_Z$ | 19 06 33 | 19 | | | 2.6mm. | | |
| | | $F_Z$ | 19 59 | | | | | | |
| July 3 | | $e_{L_Z}$? | 21 10 07 | | | | | | |
| | | $L_Z$ | 21 12 05 | 12 | | | | | |
| | | $F_Z$ | 21 21 | | | | | | |
| July 4 | | $e_{P_Z}$ | 04 37 14 | | | | | | |
| | | $e_{S_Z}$ | 04 44 08 | | | | | | |
| | | $S_{R_{1_Z}}$ | 04 47 41 | | | | | | |
| | | $e_{L_Z}$ | 04 49 47 | | | | | | |
| | | $M_{1_Z}$ | 04 54 10 | 7 | | | 34.3mm. | | |
| | | $M_{2_Z}$ | 04 57 15 | 10 | | | 26.2mm. | | |
| | | F | 05 57 | | | | | | |
| July 4 | | $e_{L_Z}$ | 07 26 | | | | | | |
| | | $L_Z$ | 07 32 41 | 19 | | | | | |
| | | $M_Z$ | 07 34 06 | 13 | | | 3.0mm. | | |
| | | $F_Z$ | In next quake. | | | | | | |
| July 4 | | $e_{L_Z}$? | 07 40 24 | | | | | | |
| | | $L_Z$ | 07 50 45 | 11-12 | | | | | |
| | | F | 08 07 | | | | | | |
| July 4 | | $e_{L_Z}$ | 08 14 55 | | | | | | |
| | | $L_Z$ | 08 16 28 | 11-12 | | | | | |
| | | $F_Z$ | 08 58 | | | | | | |
| July 4 | | $e_Z$ | 10 51 08 | | | | | | |
| | | $L_Z$ | 10 56 38 | 13 | | | | | |
| | | $F_Z$ | 10 59 | | | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS

International Seismological Centre From the ISC collection scanned by SISMOS



| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| July 5 | | $e P_E$ | 14 30 01 | | | | | |
| | | $e P_N$ | 14 30 02 | | | | | |
| | | $i S_E$ | 14 38 52 | | | | | |
| | | $e S_N$ | 14 38 53 | | | | | |
| | | $e L_E$ | 14 47 27 | | | | | |
| | | $M_E$ | 14 58 39 | 16 | | 3.2mm. | | |
| | | $M_N$ | 14 58 54 | 16 | | 1.5mm. | | |
| | | $F_{E_N}$ | Sheets off 16 hrs. 30 min.; quake still on. | | | | | |
| July 5 | | $e_Z$ | 19 14 22 | | | | | |
| | | $e_Z$ | 19 19 58 | | | | | |
| | | $L_Z$ | 19 29 09 | 18 | | | | |
| | | $M_Z$ | 19 42 37 | 11 | | | 3.2mm. | |
| | | $F_Z$ | 20 (ca.) | | | | | |
| July 5 | | $e P_E$ | 22 47 08 | | | | | |
| | | $e P_N$ | 22 47 08 | | | | | |
| | | $e S_E$ | 22 56 01 | | | | | |
| | | $e S_N$ | 22 56 00 | | | | | |
| | | $e L_Z$ | 23 05 02 | | | | | |
| | | $L_{E_N}$ | 23 13 20 | 26 | | | | |
| | | $M_E$ | 23 16 48 | 18 | | 0.9mm. | | |
| | | $M_N$ | 23 17 59 | 17 | 0.7mm. | | | |
| | | $F$ | 01 30 (ca.) | | | | | |
| July 6 | | $i P_Z$ | 02 14 44 | | | | | |
| | | $P R_{1_Z}$ | 02 17 37 | | | | | |
| | | $e S_Z$ | 02 23 10 | | | | | |
| | | $P S_Z$ | 02 23 47 | | | | | |
| | | $S R_{1_Z}$ | 02 28 06 | | | | | |
| | | $e L_Z$ | 02 32 42 | | | | | |
| | | $M_{1_Z}$ | 02 44 24 | 16 | | | 18.0mm. | |
| | | $M_{2_Z}$ | 02 45 44 | 17 | | | 32.7mm. | |
| | | $M_{3_Z}$ | 02 50 30 | 13-14 | | | 19.8mm. | |
| | | $M_{4_Z}$ | 02 52 28 | 12 | | | 18.0mm. | |
| | | $F_Z$ | 06 26 | | | | | |
| July 6 | | $i P_Z$ | 09 53 31 | | | | | |
| | | $P R_{1_Z}$ | 09 54 55 | | | | | |
| | | $i S_Z$ | 09 59 32 | | | | | |
| | | $S R_{1_Z}$ | 10 02 02 | | | | | |
| | | $e L_Z$ | 10 03 39 | | | | | |
| | | $M_{1_Z}$ | 10 06 56 | 11 | | | 35.6mm. | |
| | | $M_{2_Z}$ | 10 07 30 | 12 | | | 48.6mm. | |
| | | $M_{3_Z}$ | 10 10 28 | 12 | | | 53.8mm. | |
| | | $M_{4_Z}$ | 10 12 09 | 8-9 | | | 49.0mm. | |
| | | $M_{5_Z}$ | 10 13 41 | 13 | | | 42.4mm. | |
| | | $F_Z$ | 12 24 | | | | | |
| July 6 | | $e_Z$ | 16 34 08 | | | | | |
| | | $L_Z$ | 16 41 05 | 10 | | | | |
| | | $F_Z$ | 16 50+ | | | | | |
| July 6 | | $e_Z$ | 22 02 49 | | | | | |
| | | $L_Z$ | 22 10 32 | 8 | | | | |
| | | $F_Z$ | 22 15 | | | | | |
| July 7 | | $e_Z$ | 03 28 03 | | | | | |
| | | $e L_Z$? | 03 30 37 | | | | | |
| | | $L_Z$ | 03 33 30 | 12-13 | | | | |
| | | $F_Z$ | 03 36 | | | | | |
| July 7 | | $e_Z$ | 05 08 | | | | | |
| | | $e L_Z$? | 05 12 07 | | | | | |
| | | $F_Z$ | 05 18 | | | | | |
| July 7 | | $e_Z$ | 06 27 14 | | | | | |
| | | $e L_Z$? | 06 55 05 | | | | | |
| | | $L_Z$ | 06 56 25 | 20 | | | | |
| | | $M_{1_Z}$ | 06 58 09 | 20 | | | 2.9mm. | |
| | | $M_{2_Z}$ | 07 01 06 | 19 | | | 3.0mm. | |
| | | $F_Z$ | 07 52 | | | | | |
| July 7 | | $e_Z$ | 09 38 14 | | | | | |
| | | $e L_Z$? | 10 05 04 | | | | | |
| | | $L_Z$ | 10 07 20 | 21 | | | | |
| | | $M_{1_Z}$ | 10 09 21 | 21 | | | 4.0mm. | |
| | | $M_{2_Z}$ | 10 14 34 | 14 | | | 3.6mm. | |
| | | $F_Z$ | 11 20 | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| July 7 | | $e^{P}E_N$ | 21 34 09 | | | | | $iP_Z$ 21 34 07 |
| | | $S_{E_N}$ | 21 42 57 | | | | | $iS_Z$ 21 43 02 |
| | | $i_{E_N}$ | 21 44 05 | | | | | |
| | | $S_{R_1EN}$ | 21 48 07 | | | | | |
| | | $e^{L}E_N$ | 21 54 05 | | | | | |
| | | $M_{1_E}$ | 22 01 10 | 17 | | 4.3mm. | | |
| | | $M_{1_{N_1}}$ | 22 02 14 | 18 | 2.0mm. | | | |
| | | $M_{2_E}$ | 22 02 48 | 21-22 | | 4.6mm. | | |
| | | $M_{3_E}$ | 22 03 59 | 18 | | 3.9mm. | | |
| | | $M_{2_N}$ | 22 05 01 | 21-22 | 4.1mm. | | | |
| | | $F_{E_N}$ | 23 (ca.) | | | | | |
| July 8 | | $e_Z$ | 10 39 42 | | | | | Possibly $e^{L}Z$ |
| | | $L_Z$ | 10 47 25 | 11-12 | | | | |
| | | $L_Z$ | 10 49 16 | 13 | | | | |
| | | $F_Z$ | 11 13 | | | | | |
| July 8 | | $e_Z$ | 17 00 41 | | | | | |
| | | $e^{L}Z?$ | 17 04 15 | | | | | Very heavy micros. |
| | | $M_{1_Z}$ | 17 06 40 | 8 | | | 20.0mm. | |
| | | $M_{2_Z}$ | 17 08 06 | 7 | | | | |
| | | $F_Z$ | 17 54 | | | | | |
| July 8 | | $e_Z$ | 18 38 10 | | | | | Very heavy micros. |
| | | $e^{L}Z$ | 18 54 36 | 9 | | | | |
| | | $L_Z$ | 18 58 03 | 16 | | | | |
| | | $M_Z$ | 18 59 25 | 14-15 | | | 2.1mm. | |
| | | $F_Z$ | In next quake. | | | | | |
| July 8 | | $e_Z$ | 19 28 37 | | | | | |
| | | $e^{L}Z?$ | 19 41.0 | | | | | |
| | | $M_{1_Z}$ | 19 50 42 | 14 | | | 6.8mm. | |
| | | $M_{2_Z}$ | 19 51 43 | 13 | | | 7.0mm. | |
| July 8 | | $e_Z$ | 19 28 37 | | | | | |
| | | $e^{L}Z?$ | 19 41.0 | | | | | |
| | | $M_{1_Z}$ | 19 50 42 | 14 | | | 6.8mm. | |
| | | $M_{2_Z}$ | 19 51 43 | 13 | | | 7.0mm. | |
| | | $M_{3_Z}$ | 20 02 53 | 16 | | | 5.3mm. | |
| | | $M_{4_Z}$ | 20 07 51 | 11-12 | | | 4.6mm. | |
| | | $F_Z$ | 23 (ca.) | | | | | |
| July 9 | | $e_Z$ | 06 23 05 | | | | | |
| | | $e^{L}Z$ | 06 26 21 | 7-8 | | | | |
| | | $L_Z$ | 06 32 15 | 15 | | | | |
| | | $F_Z$ | 06 38 | | | | | |
| July 9 | | $e_Z$ | 09 08 | | | | | |
| | | $L_Z$ | 09 19 17 | 17 | | | | |
| | | $L_Z$ | 09 26 25 | 13 | | | | |
| | | $F_Z$ | 09 56 | | | | | |
| July 9 | | $e_Z?$ | 21 41 21 | | | | | Possibly sooner or later. |
| | | $i_Z$ | 21 44 11 | | | | | |
| | | $e^{L}Z?$ | 21 47 19 | | | | | |
| | | $L_Z$ | 21 50 44 | 10 | | | | |
| | | $L_Z$ | 21 56 16 | 8 | | | | |
| | | $F_Z$ | 22 03 | | | | | |
| July 10 | | $e_Z$ | 22 38 05 | | | | | |
| | | $L_Z$ | 22 44 41 | 13 | | | | |
| | | $F_Z$ | 22 56 | | | | | |
| July 11 | | $e_Z$ | 13 47 32 | | | | | Possibly as early as 13hrs 23 min. |
| | | $e^{L}Z$ | 14 06 18 | | | | | |
| | | $L_Z$ | 14 11 32 | 8-9 | | | | Very heavy micros. |
| | | $M_{1_Z}$ | 14 16 33 | 11 | | | 2.7mm. | |
| | | $M_{2_Z}$ | 14 18 16 | 15 | | | 1.9mm. | |
| | | $F_Z$ | 15 10 | | | | | |
| July 11 | | $e^{P}Z$ | 21 07 55 | | | | | |
| | | $S_Z$ | 21 16 49 | | | | | |
| | | $e^{L}Z$ | 21 27 03 | | | | | |
| | | $L_Z$ | 21 35 44 | 9 | | | | |
| | | $M_{1_Z}$ | 21 40 47 | 13-14 | | | 6.7mm. | |
| | | $M_{2_Z}$ | 21 43 18 | 13 | | | 4.8mm. | |
| | | $F_Z$ | 23 15 | | | | | |
| July 12 | | $L_Z$ | 10 58 20 | 10 | | | | |
| | | $F_Z$ | 11 07 | | | | | |

International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Aug. 1 | | $e_Z$ | 05 21 16 | | | | | | P'? |
| | | $P R_{1Z}$ | 05 23 23 | | | | | | ? |
| | | $P_S$ | 05 36 34 | | | | | | ? |
| | | $e_{L_Z}$ | 06 08 56 | | | | | | ? |
| | | $L_Z$ | 06 18 28 | | | | | | |
| | | $M_{1Z}$ | 06 24 50 | 26 | | | 2.3mm. | | |
| | | $M_{2Z}$ | 06 31 28 | 17 | | | 2.3mm. | | |
| | | $F_Z$ | 07 02 | | | | | | |
| Aug. 1 | | $e_{L_Z}$ | 09 11 09 | | | | | | |
| | | $L_Z$ | 09 18 17 | 17 | | | | | |
| | | $M_Z$ | 09 25 19 | 15-16 | | | 2.3mm. | | |
| | | $F_Z$ | 10 04 | | | | | | |
| Aug. 2 | | $e_Z$ | 18 09 09 | | | | | | Possibly earlier. |
| | | $F_Z$ | 18 15 | | | | | | |
| Aug. 3 | | $e_Z$ | 13 03 44 | | | | | | Possibly sooner. |
| | | $i_Z$ | 13 08 00 | | | | | | |
| | | $e_{L_Z}$ | 13 40 30 | | | | | | |
| | | $L_Z$ | 13 40 59 | 19 | | | | | |
| | | $M_{1Z}$ | 13 43 15 | 22 | | | 3.9mm. | | |
| | | $M_{2Z}$ | 13 47 40 | 17 | | | 5.2mm. | | |
| | | $F_Z$ | In next quake | | | | | | |
| Aug. 3 | | $e_Z$ | 15 14 34 | | | | | | |
| | | $i_Z$ | 15 16 34 | | | | | | |
| | | $e_{L_Z}$ | 15 42 11 | | | | | | |
| | | $L_Z$ | 15 59 11 | 20 | | | | | |
| | | $M_Z$ | 16 03 36 | 18 | | | 3.5mm. | | |
| | | $F_Z$ | 18 30 | | | | | | |
| Aug. 3 | | $e_Z$ | 18 56 32 | | | | | | |
| | | $P_{S_Z?}$ | 19 06 04 | | | | | | |
| | | $e_{L_Z?}$ | 19 21 02 | | | | | | |
| | | $L_Z$ | 19 25 28 | 17 | | | | | |
| | | $M_{1Z}$ | 19 27 09 | 17 | | | 12.0mm. | | |
| | | $M_{2Z}$ | 19 30 46 | 13 | | | 6.4mm. | | |
| | | $M_{3Z}$ | 19 33 09 | 12-13 | | | 7.4mm. | | |
| | | $M_{4Z}$ | 19 36 29 | 12-13 | | | 5.5mm. | | |
| | | $F_Z$ | 21 05 | | | | | | |
| Aug. 4 | | $e_Z$ | 09 21 35 | | | | | | |
| | | $e_{L_Z}$ | 09 30 19 | | | | | | |
| | | $L_Z$ | 09 31 08 | 14 | | | | | |
| | | $F_Z$ | 09 58 | | | | | | |
| Aug. 4 | | $L_Z$ | 14 51 to 14 57 | | | | | | Very small amplitudes. |

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| | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|
| Aug. 4 | $e_Z$ | 15 19 54 | | | | | |
| | $e^{L_Z?}$ | 15 24 50 | | | | | |
| | $L_Z$ | 15 32 31 | 11-12 | | | | |
| | $F_Z$ | 16 08 | | | | | |
| Aug. 4 | $e_Z$ | 22 41 | | | | | |
| | $e^{L_Z}$ | 23 04 23 | | | | | |
| | $L_Z$ | 23 10 09 | 18 | | | | |
| | $F_Z$ | 00 15 | | | | | |
| Aug. 6 | $e_Z$ | 01 45 07 | | | | | |
| | $e^{L_Z}$ | 01 52 00 | | | | | |
| | $L_{Z_1}$ | 01 57 12 | 12-13 | | | | |
| | $L_{Z_2}$ | 01 59 29 | 12-13 | | | | |
| | $F_Z$ | 02 20 | | | | | |
| Aug. 7 | $e_Z$ | 07 40 19 | | | | | |
| | $e^{L_Z?}$ | 07 45 28 | | | | | |
| | $F_Z$ | 08 (ca.) | | | | | |
| Aug. 8 | $iP_Z$ | 13 17 49 | | | | | |
| | $P_S?$ | 13 27 37 | | | | | |
| | $e^{L_Z}$ | 13 57 10 | | | | | Possibly as early as 13-52-56 |
| | $M_{1_Z}$ | 14 10 50 | 19 | | | 7.0mm. | |
| | $M_{2_Z}$ | 14 13 16 | 15 | | | 7.7mm. | |
| | $M_{3_Z}$ | 14 16 16 | 18 | | | 7.2mm. | |
| | $M_{4_Z}$ | 14 17 43 | 15 | | | 9.2mm. | |
| | $F_Z$ | 16 (ca.) | | | | | |
| Aug. 9 | $e_{Z_1}$ | 03 04 55 | | | | | |
| | $e_{Z_2}$ | 03 07 55 | | | | | |
| | $e^{L_Z}$ | 03 12 34 | | | | | |
| | $F_Z$ | 03 26 | | | | | |
| Aug. 9 | $L_Z$ | 19 34 to 19 50 | | | | | Very small amplitude |
| Aug. 11 | $e_Z$ | 18 44 09 | | | | | No distinct M. |
| | $e^{L_Z}$ | 19 13 24 | | | | | |
| | $L_Z$ | 19 17 01 | 14 | | | | |
| | $F_Z$ | 19 44 | | | | | |
| Aug. 12 | $iP_Z$ | 11 26 00 | | | | | |
| | $e^{S_Z}$ | 11 26 54 | | | | | |
| | $e^{L_Z}$ | 11 27 05 | | | | | |
| | $M_Z$ | 11 27 11 | | | | | |
| | $F_Z$ | 12 05 | | | | | |
| Aug. 13 | $e_Z$ | 15 06 53 | | | | | |
| | $e^{L_Z}$ | 15 17 51 | | | | | |
| | $L_Z$ | 15 18 02 | 17 | | | | |
| | $F_Z$ | 15 40 (et postea) | | | | | |
| Aug. 13 | $e_Z$ | 19 27 52 | | | | | |
| | $L_Z$ | 19 35 34 | 9 | | | | |
| | $M_Z$ | 19 35 59 | 13 | | | 3.1mm. | |
| | $F_Z$ | 19 50 | | | | | |
| Aug. 14 | $e_Z$ | 02 38 55 | | | | | |
| | $e^{L_Z}$ | 03 11 00 | | | | | |
| | $L_Z$ | 03 22 00 | 17-18 | | | | |
| | $F_Z$ | 04 30 | | | | | |
| Aug. 14 | $e_Z$ | 13 37 46 | | | | | Possibly sooner. Very heavy micros. |
| | $e^{L_Z?}$ | 13 45 16 | | | | | |
| | $L_Z$ | 13 49 26 | | | | | |
| | $F_Z$ | 14 (ca.) | | | | | |
| Aug. 14 | $e_{Z_1}$ | 14 42 13 | | | | | |
| | $e_{Z_2}$ | 14 45 46 | | | | | |
| | $e^{L_Z}$ | 14 50 50 | | | | | |
| | $L_Z$ | 14 53 57 | 8-9 | | | | |
| | $M_{1_Z}$ | 15 03 09 | 10 | | | | |
| | $M_{2_Z}$ | 15 04 53 | 8-9 | | | 5.8mm. | |
| | $F_Z$ | 17 05 | | | | | |
| Aug. 14 | $e^{P_Z}$ | 19 11 08 | | | | | Very heavy micros. |
| | $e^{S_Z}$ | 19 17 09 | | | | | |
| | $e^{L_Z}$ | 19 20 59 | | | | | |
| | $M_{1_Z}$ | 19 28 11 | 11 | | | 6.5mm. | |
| | $M_{2_Z}$ | 19 30 25 | 9 | | | 8.0mm. | |
| | $M_{3_Z}$ | 19 32 23 | 9 | | | 10.2mm. | |
| | $F_Z$ | 22 06 | | | | | |

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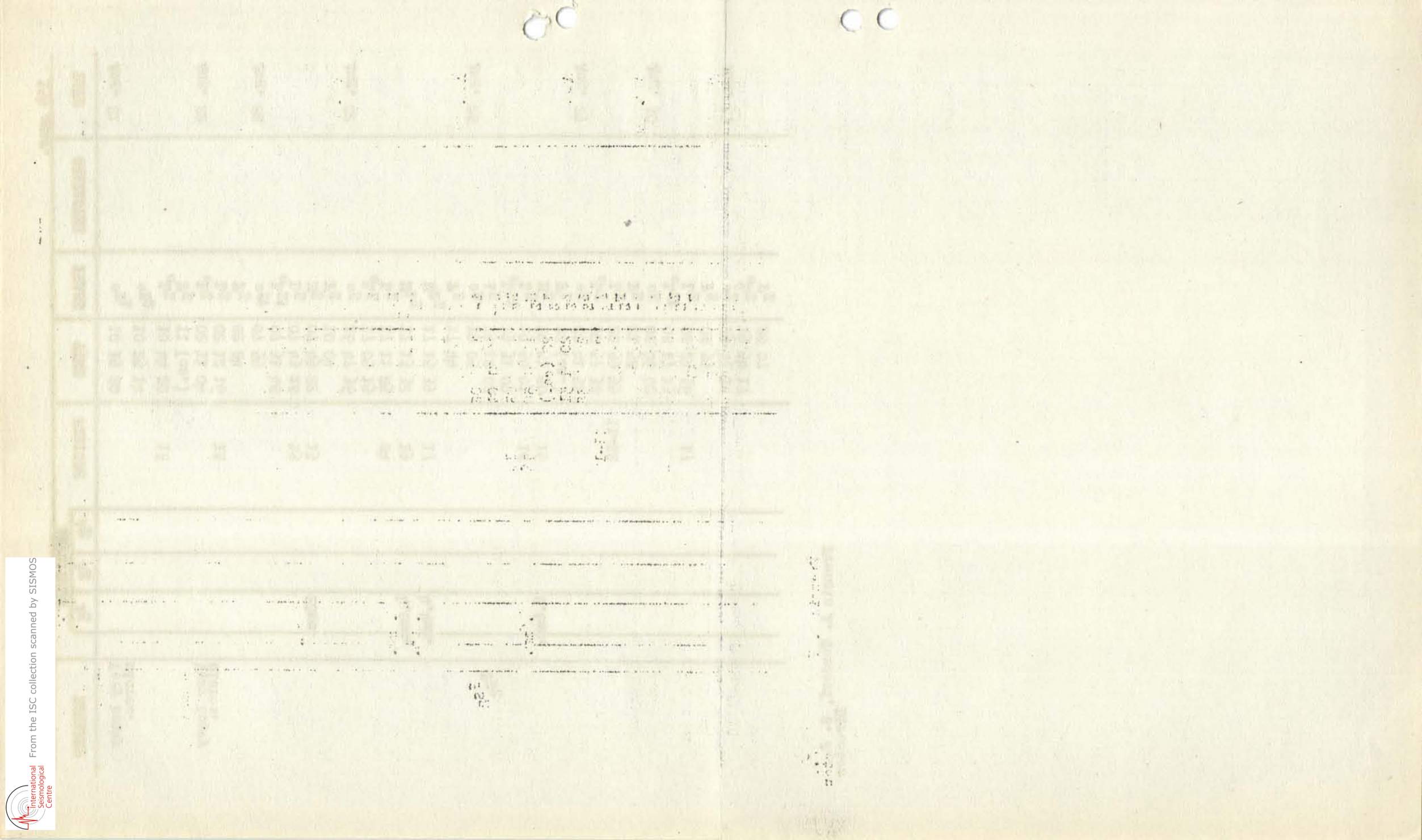
| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Aug. 15 | | $iP_Z$ | 20 03 22 | | | | | |
| | | $eS_Z$ | 20 09 46 | | | | | |
| | | $S_{R_1Z}$ | 20 12 34 | | | | | |
| | | $S_{R_2Z}$ | 20 13 32 | | | | | |
| | | $eL_Z$ | 20 14 26 | | | | | |
| | | $M_Z$ | 20 17 38 | 17 | | | 17.3mm. | |
| | | $F_Z$ | 22 09 | | | | | |
| Aug. 16 | | $e_{Z_1}$ | 10 24 48 | | | | | |
| | | $e_{Z_2}$ | 10 28 16 | | | | | |
| | | $eL_Z$ | 10 40 08 | | | | | |
| | | $L_Z$ | 10 41 14 | 9 | | | | |
| | | $M_Z$ | 10 45 50 | 10 | | | 3.0mm. | |
| | | $F_Z$ | 11 09 | | | | | |
| Aug. 16 | | $e_Z$ | 21 48 31 | | | | | No distinct M. |
| | | $eL_Z$? | 22 32 04 | | | | | |
| | | $L_Z$ | 22 59 47 | 11-12 | | | | |
| | | $F_Z$ | 23 43 | | | | | |
| Aug. 17 | | $eP_{EN}$ | 23 46 51 | | | | | Rest of phases lost in changing of sheet. |
| | | $P_{R_1EN}$ | 23 47 44 | | | | | |
| | | $S_{EN}$ | 23 51 59 | | | | | |
| | | $eL_{EN}$ | 23 53 59 | | | | | $iP_Z$ 23-46-56 |
| Aug. 18 | | $e_Z$ | 06 54 57 | | | | | |
| | | $L_Z$ | 07 00 13 | 12-13 | | | | |
| | | $F_Z$ | 07 14 | | | | | |
| Aug. 18 | | $e_{Z_1}$ | 08 55 20 | | | | | |
| | | $e_{Z_2}$ | 09 05 22 | | | | | |
| | | $e_{Z_3}$ | 09 08 00 | | | | | |
| | | $e_{Z_4}$ | 09 12 36 | | | | | |
| | | $eL_Z$ | 09 28 01 | | | | | |
| | | $L_Z$ | 09 34 01 | 14 | | | | |
| | | $M_{1Z}$ | 09 41 31 | 18 | | | 10.2mm. | |
| | | $M_{2Z}$ | 09 46 33 | 17 | | | 9.5mm. | |
| | | $F_Z$ | 11 22 | | | | | |
| Aug. 19 | | $e_{Z_1}$ | 03 02 06 | | | | | Possibly later. |
| | | $e_{Z_2}$ | 03 12 10 | | | | | $PS_2$? |
| | | $eL_Z$ | 03 35 24 | | | | | |
| | | $L_Z$ | 03 42 35 | 18 | | | | |
| | | $M_{1Z}$ | 03 54 40 | 16 | | | 11.8mm. | |
| | | $M_{2Z}$ | 03 55 59 | 18 | | | 14.7mm. | |
| | | $M_{3Z}$ | 03 57 27 | 15 | | | 15.0mm. | |
| | | $M_{4Z}$ | 04 01 01 | 15 | | | 17.3mm. | |
| | | $M_{5Z}$ | 04 03 02 | 15 | | | 12.2mm. | |
| | | $F_Z$ | 05 25 | | | | | |
| Aug. 19 | | $e_{Z_1}$ | 17 52 53 | | | | | |
| | | $e_{Z_2}$ | 18 00 22 | | | | | |
| | | $eL_Z$? | 18 07 43 | | | | | |
| | | $M_{1Z}$ | 18 14 47 | 12 | | | 3.8mm. | |
| | | $F_Z$ | 18 40 | | | | | |
| Aug. 19 | | $e_{Z_1}$ | 20 53 07 | | | | | |
| | | $e_{Z_2}$ | 21 07 55 | | | | | |
| | | $eL_Z$ | 21 46 09 | | | | | |
| | | $L_Z$ | 21 55 09 | 13 | | | | |
| | | $M_Z$ | 21 57 32 | 17 | | | 2.7mm. | |
| | | $F_Z$ | 21 29 | | | | | |
| Aug. 20 | | $e_{Z_1}$ | 16 58 04 | | | | | |
| | | $e_{Z_2}$ | 17 06 41 | | | | | |
| | | $F_Z$ | In following quake | | | | | |
| Aug. 20 | | $iP_Z$ | 17 43 22 | | | | | |
| | | $iS$ | 17 49 48 | | | | | |
| | | $eL_Z$ | 17 53 26 | | | | | |
| | | $L_Z$ | 17 54 38 | 17 | | | | |
| | | $M_Z$ | 17 56 59 | 15-16 | | | 25.0mm. | |
| | | $F_Z$ | 19 35 | | | | | |

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International Seismological Centre From the ISC collection scanned by SISMOS

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Aug. 21 | | $e_{Z_1}$ | 10 19 20 | | | | | Very heavy micros. |
| | | $e_{Z_2}$ | 10 25 14 | | | | | |
| | | $_eL_Z$ | 10 44 20 | 16 | | | | |
| | | $F_Z$ | 11 (ca.) | | | | | |
| Aug. 22 | | $_eL_Z$ | 02 11 04 | | | | | Very heavy micros. |
| | | $L_Z$ | 02 12 16 | 18 | | | | |
| | | $F_Z$ | 02 24 | | | | | |
| Aug. 22 | | $e_{Z?}$ | 07 55 | | | | | |
| | | $_eL_{Z?}$ | 07 31 48 | | | | | |
| | | $L_Z$ | 07 43 18 | 15 | | | | |
| | | $M_Z$ | 07 49 22 | 15 | | | 20mm. | |
| | | $F_Z$ | 10 04 | | | | | |
| Aug. 22 | | $e_Z$ | 16 47 36 | | | | | |
| | | $_eL_Z$ | 17 05 15 | | | | | |
| | | $L_Z$ | 17 11 25 | 24 | | | | |
| | | $M_{1_Z}$ | 17 13 32 | 19 | | | 4.0mm. | |
| | | $M_{2_Z}$ | 17 15 39 | 17 | | | 4.4mm. | |
| | | $F_Z$ | 17 44 | | | | | |
| Aug. 28 | | $e_Z$ | 19 05 | | | | | |
| | | $i_Z$ | 19 12 08 | | | | | $P_{S_2}$ |
| | | $_eL_{Z?}$ | 19 31 09 | | | | | |
| | | $L_Z$ | 19 50 03 | 18 | | | | |
| | | $M_Z$ | 19 51 50 | 16 | | | 6.6mm. | |
| | | $F_Z$ | 22 (ca.) | | | | | |
| Aug. 29 | | $e_Z$ | 20 41 51 | | | | | |
| | | $_eL_Z$ | 20 57 38 | | | | | |
| | | $L_Z$ | 20 59 55 | 11-12 | | | | |
| | | $F_Z$ | 21 58 | | | | | |
| Aug. 30 | | $e_Z$ | 08 06 02 | | | | | |
| | | $_eL_{Z?}$ | 08 17 13 | | | | | |
| | | $L_Z$ | 08 24 36 | 17 | | | | |
| | | $F_Z$ | 08 35 | | | | | |
| Aug. 31 | | $e_Z$ | 19 47 18 | | | | | |
| | | $_eL_Z$ | 19 54 17 | | | | | |
| | | $F_Z$ | 20 07 | | | | | |

Francis A. Tondorf, S. J.,
Director



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International Seismological Centre

International Seismological Centre From the ISC collection scanned by SISMOS

No. 122 *From* September 1 *to* September 30, *19* 29

# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 99 | 4.6 | 3.7 |
| | $A_E$ | 89 | 5.1 | 5.7 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 55 | 8.3 | 5.3 |
| | $A_E$ | 31 | 9.0 | 4.3 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 1 | | $e_Z$ | 16 14 07 | | | | | | Heavy micros. |
| | | $e_Z$ | 16 24 13 | | | | | | |
| | | $e_Z$ | 16 32 15 | | | | | | |
| | | $e_{L_Z}$ | 16 53 24 | | | | | | |
| | | $L_Z$ | 16 58 16 | 14 | | | | | |
| | | $L_Z$ | 17 06 10 | 14 | | | | | |
| | | $F_Z$ | 18 (ca.) | | | | | | |
| Sept. 2 | | $i_Z$ | 11 32 55 | | | | | | |
| | | $i_Z$ | 11 35 09 | | | | | | |
| | | $i_Z$ | 11 46 27 | | | | | | PS? |
| | | $e_{L_Z}$ | 12 13 03 | | | | | | Possibly later. |
| | | $L_Z$ | 12 29 21 | 14 | | | | | |
| | | $M_Z$ | 12 39 13 | 17 | | | 4.2mm. | | |
| | | $F_Z$ | | | | | | | Sheets off at 13hrs.10m. Quake still on |
| Sept. 5 | | $e_Z$ | 10 17 52 | | | | | | |
| | | $i_Z$ | 10 19 21 | | | | | | $e_{L_Z}$ ? |
| | | $L_Z$ | 10 20 06 | 12 | | | | | |
| | | $M_Z$ | 10 20 52 | 8 | | | 6.3mm. | | |
| | | $F_Z$ | 10 24 | | | | | | |
| Sept. 8 | | $e_Z$ | 10 59 09 | | | | | | |
| | | $i_Z$ | 11 00 00 | | | | | | |
| | | $L_Z$ | 11 02 04 | 10 | | | | | |
| | | $M_Z$ | 11 02 33 | 10 | | | 8.3mm. | | |
| | | $F_Z$ | 11 38 | | | | | | |
| Sept. 8 | | $e_Z$? | 12 05 | | | | | | |
| | | $e_{L_Z}$? | 12 08 20 | | | | | | |
| | | $F_Z$ | 12 16 | | | | | | |
| Sept. 8 | | $e_Z$ | 14 14 15 | | | | | | |
| | | $e_{L_Z}$ | 14 16 26 | | | | | | |
| | | $L_Z$ | 14 17 03 | 10-11 | | | | | |
| | | $F_Z$ | 14 43 | | | | | | |
| Sept. 8 | | $e_Z$ | 15 00 00 | | | | | | |
| | | $e_Z$ | 15 08 11 | | | | | | |
| | | $F_Z$ | 15 21 | | | | | | |
| Sept. 8 | | $e_Z$ | 20 30 53 | | | | | | |
| | | $e_{L_Z}$ | 20 33 52 | | | | | | |
| | | $L_Z$ | 20 34 24 | 10 | | | | | |
| | | $F_Z$ | 20 50 | | | | | | |
| Sept. 9 | | $e_Z$ | 04 51 06 | | | | | | |
| | | $e_{L_Z}$ | 04 55 35 | | | | | | |
| | | $L_Z$ | 05 02 40 | 12 | | | | | |
| | | $F_Z$ | 05 08 | | | | | | |

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| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE AN | AE | AZ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Sept. 9 | | $e_Z$ | 18 02 51 | | | | | Difficult. |
| | | $e_Z$ | 18 06 19 | | | | | Heavy micros. |
| | | $e_{L_Z}$? | 18 49 43 | | | | | |
| | | $L_Z$ | 18 53 11 | 11 | | | | |
| | | $F_Z$ | 19 03 | | | | | |
| Sept. 10 | | $e_Z$ | 19 38 58 | | | | | Possibly sooner. |
| | | $e_{L_Z}$? | 19 43 12 | | | | | Heavy micros. |
| | | $L_Z$ | 19 46 13 | 8 | | | | |
| | | $L_Z$ | 19 51 09 | 9 | | | | |
| | | $F_Z$ | 20 03 | | | | | |
| Sept. 10 | | $i_Z$ | 20 42 20 | | | | | P' ? |
| | | $i_Z$ | 20 59 10 | | | | | Possibly sooner? |
| | | $e_{L_Z}$ | 21 36 49 | | | | | |
| | | $L_Z$ | 21 42 54 | 14 | | | | |
| | | $M_Z$ | 21 45 36 | 11 | | | 1.8mm. | |
| | | $F_Z$ | 22 35 | | | | | |
| Sept. 11 | | $e_Z$ | 22 57 11 | | | | | |
| | | $e_{L_Z}$ | 23 20 13 | | | | | |
| | | $L_Z$ | 23 31 56 | 15 | | | | |
| | | $M_Z$ | 23 35 17 | 15 | | | 2.5mm. | |
| | | $F_Z$ | 23 55 | | | | | |
| Sept. 14 | | $i_Z$ | 03 00 18 | | | | | |
| | | $e_{L_Z}$? | 03 15 30 | | | | | |
| | | $L_Z$ | 03 19 20 | 20 | | | | |
| | | $F_Z$ | 04 (ca.) | | | | | |
| Sept. 14 | | $e_Z$ | 05 50 | | | | | Heavy micros. |
| | | $i_Z$ | 05 54 15 | | | | | |
| | | $F_Z$ | 06 05 | | | | | |
| Sept. 15 | | $e_{L_Z}$ | 13 44 20 | | | | | |
| | | $L_Z$ | 13 54 15 | | | | | |
| | | $L_Z$ | 14 03 20 | 13-14 | | | | |
| | | $F_Z$ | 14 14 | | | | | |
| Sept. 16 | | $e_Z$ | 04 00 02 | | | | | |
| | | $L_Z$ | 04 10 28 | 13 | | | | |
| | | $F_Z$? | | | | | | |
| Sept. 17 | | $e_Z$ | 05 37 52 | | | | | Difficult. Very heavy micros. Possibly sooner |
| | | $L_Z$ | 05 45 09 | 11 | | | | |
| | | $M_Z$ | 05 51 53 | 15 | | | 6.8mm. | Very heavy micros. |
| | | $F_Z$ | 06 50 | | | | | |
| Sept. 17 | | $e^P E_N$ | 19 25 03 | | | | | |
| | | $i^S E_N$ | 19 31 16 | | | | | |
| | | $e_{L_{E_N}}$ | 19 36 09 | | | | | |
| | | $M1_E$ | 19 38 28 | 5-6 | | 25.6mm. | | |
| | | $M1_N$ | 19 38 28 | 5-6 | 12.7mm. | | | |
| | | $M2_E$ | 19 40 32 | 9 | | 39.7mm. | | |
| | | $M2_N$ | 19 40 31 | 9 | 20.0mm. | | | |
| | | $F_{E_N}$ | 20 (ca.) | | | | | |
| Sept. 17 | | $iP_Z$ | 19 25 03 | | | | | |
| | | $iS_Z$ | 19 31 23 | | | | | Amplitude of other phases so large that they could not be differentiated. |
| | | $iSR1_Z$ | 19 34 06 | | | | | |
| | | $F_Z$ | 23 52 | | | | | |
| Sept. 18 | | $L_Z$ | 16 08 25 to 16 16 | | | | | |
| Sept. 18 | | $e_Z$ | 17 04 19 | | | | | |
| | | $L_Z$ | 17 23 30 | 14 | | | | |
| | | $F_Z$ | 17 41 | | | | | |
| Sept. 21 | | $e_Z$ | 16 52 00 | | | | | |
| | | $i_Z$ | 16 54 33 | | | | | Heavy micros. |
| | | $L_Z$ | 16 55 43 | 8 | | | | |
| | | $L_Z$ | 16 57 07 | 14 | | | | |
| | | $M1_Z$ | 16 58 09 | 9 | | 8.0mm. | | |
| | | $M2_Z$ | 16 59 19 | 8 | | 10.2mm. | | |
| | | $F_Z$ | 17 20 | | | | | |
| Sept. 22 | | $e_Z$ | 17 00 55 | | | | | |
| | | $e_{L_Z}$? | 17 04 18 | | | | | Heavy micros. |
| | | $F_Z$ | 17 15 | | | | | |

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September 1 to September 30, 1929

| DATE | CHARACTER | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | AMPLITUDE $A_E$ | AMPLITUDE $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| Sept. 23 | | $e_Z$ | 16 21 07 | | | | | |
| | | $e^L_Z$ | 16 29 32 | | | | | |
| | | $i_Z$ | 16 40 25 | | | | | |
| | | $F_Z$ | 16 50 | | | | | |
| Sept. 24 | | $e_Z$ | 02 19 14 | | | | | |
| | | $e^L_Z$ | 02 23 28 | | | | | |
| | | $L_Z$ | 02 37 10 | 14 | | | | |
| | | $L_Z$ | 02 40 14 | 12-13 | | | | |
| | | $F_Z$ | 03 10 | | | | | |
| Sept. 24 | | $e^L_Z$ | 17 20 26 | | | | | |
| | | $L_Z$ | 17 40 26 | | | | | |
| | | $F_Z$ | 18 (ca.) | | | | | |
| Sept. 26 | | $e_Z$ | 05 02 10 | | | | | |
| | | $e_Z$ | 05 11 24 | | | | | Very heavy micros. |
| | | $e^L_Z$ | 05 22 04 | | | | | |
| | | $L_Z$ | 05 26 05 | 9 | | | | |
| | | $M_Z$ | 05 31 46 | 9 | | | 7.0mm. | |
| | | $F_Z$ | 07 14 | | | | | |
| Sept. 26 | | $e_Z$ | 12 48 32 | | | | | Heavy micros. |
| | | $L_Z$ | 12 54 05 | | | | | |
| | | $F_Z$ | 13 (ca.) | | | | | |
| Sept. 26 | | $e_Z$ | 15 46 38 | | | | | |
| | | $i_Z$ | 15 49 11 | | | | | |
| | | $e^L_Z$? | 15 53 28 | | | | | |
| | | $L_Z$ | 15 55 19 | 12 | | | | |
| | | $M_{1Z}$ | 15 56 02 | 11 | | | 4.0mm. | |
| | | $M_{2Z}$ | 15 57 48 | 11 | | | 3.1mm. | |
| | | $F_Z$ | 16 31 | | | | | |
| Sept. 26 | | $e_Z$ | 19 35 | | | | | |
| | | $i_Z$ | 19 39 52 | | | | | $e_Z$ possibly as as 19hrs. 7m. 40sec. |
| | | $L_Z$ | 19 41 08 | 9 | | | | |
| | | $F_Z$ | 19 54 | | | | | |
| Sept. 26 | | $e_Z$ | 20 14 43 | | | | | |
| | | $i_Z$ | 20 17 44 | | | | | |
| | | $L_Z$ | 20 19 51 | 10 | | | | $e^L_Z$? |
| | | $F_Z$ | 20 33 | | | | | |
| Sept. 27 | | $e^P_Z$ | 23 22 26 | | | | | |
| | | $i_Z$ | 23 22 46 | | | | | |
| | | $i^S_Z$ | 23 28 22 | | | | | |
| | | $S_{R1Z}$ | 23 30 26 | | | | | |
| | | $M_Z$ | 23 34 27 | 11 | | | 53.5mm. | |
| | | $F_Z$ | 01 14 | | | | | |
| Sept. 28 | | $e_Z$ | 22 42 42 | | | | | |
| | | $e^L_Z$? | 22 46 09 | | | | | |
| | | $F_Z$ | 22 54 | | | | | |
| Sept. 29 | | $e_Z$ | 19 40 52 | | | | | |
| | | $F_Z$ | 19 55 | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 110 | 4.9 | 1.3 |
| | $A_E$ | 106 | 5.2 | 1.3 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | — | — | — |
| | $A_E$ | — | — | — |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 27 | 10.1 | 1.3 |
| | $A_E$ | 53 | 8.5 | 1.2 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date October 1929 | Character COMPONENT | Phase | Time | Periods | Trace Amplitude $A_N$ | $A_E$ | $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 4.18 | Z | eL | 4h 12m 52s | | | | | | |
| | | M | 4 14 52 | 15 | | | 1.5mm. | | |
| | | F | 4 32 | | | | | | |
| 4.23 | | P? | 10 5 15 | | | | | | |
| | | S? | 10 11 42 | | | | | | |
| | | eL | 10 17 27 | 14 | | | | | |
| | | M | 10 19 23 | 8 | | | 2.5 | | |
| | | F | 10 23 22 | | | | | | |
| 5.16 | Z | i | 3 43 31 | 5 | | | 1.5mm. | | |
| | | eL | 3 52 13 | 23 | | | | | |
| | | M | 4 0 8 | 18 | | | 1.5 | | |
| | | F | 4 44 | | | | | | |
| 5.72 | Z | P | 17 11 39 | 6 | | | 5.2 | | |
| | | PR1 | 17 15 16 | 6 | | | 1.5 | | |
| | | PR2 | 17 17 5 | 6 | | | 1.5 | | |
| | | eS | 17 21 12 | | | | | | |
| | | PS | 17 21 52 | | | | | | |
| | | i | 17 25 25 | | | | | | |
| | | eSR1 | 17 26 27 | | | | | | |
| | | eL | 17 35 5 | | | | | | |
| | | M | 17 47 12 | 21 | | | 6.5 | | |
| | | F | obscured. | | | | | | |
| 6.25 | Z | P | 5 59 55 | 4 | | | 0.6 | | |
| | | PR1 | 6 1 33 | 5 | | | 1.0 | | |
| | | eS | 6 6 1 | 10 | | | 0.4 | | |
| | | eL | 6 14 37 | 40 | | | | | |
| | | M1 | 6 19 12 | 20 | | | 2.0 | | |
| | | M2 | 6 24 1 | 15 | | | 3.0 | | |
| | | M3 | 6 35 24 | 13 | | | 1.4 | | |
| | | C | 6 36 | | | | | | |
| | | F | 7 13 | | | | | | |
| 6.34 | Z | P | 8 2 31 | 5 | | | 8.0 | | |
| | | PR1 | 8 5 33 | 7 | | | 2.0 | | |
| | | PR2 | 8 7 21 | 10 | | | 2.0 | | |
| | | S | 8 12 2 | 10 | | | 2.5 | | |
| | | SR1 | 8 16 25 | 12 | | | 2.0 | | |
| | | eL | 8 24 5 | 36 | | | | | |
| | | M1 | 8 33 2 | 17 | | | 13.3 | | |
| | | M2 | 8 39 7 | 14 | | | 11.0 | | |
| | | C | 10 4 | | | | | | |
| | | W | 10 27 31 | | | | | | |
| | | F | 11 28 | | | | | | |
| 6.58 | Z | iP | 13 56 49 | 5 | | | 1.0 | | |
| | | PR1 | 13 58 8 | 6 | | | 1.0 | | |
| | | eS | 14 2 57 | 12 | | | 0.5 | | |
| | | eL | 14 7 27 | 35 | | | | | |
| | | M1 | 14 12 8 | 16 | | | 2.0 | | |
| | | M2 | 14 15 5 | 16 | | | 1.5 | | |
| | | M3 | 14 21 21 | 17 | | | 2.0 | | |
| | | M4 | 14 31 20 | 8 | | | 2.6 | | |
| | | C | 14 34 0 | | | | | | |
| | | F | 14 58 | | | | | | |
| 7.66 | Z | i | 15 45 33 | 5 | | | 1.5 | | |
| | | eL | 16 1 34 | 40 | | | | | |
| | | M | 16 10 29 | 15 | | | 2.5 | | |
| | | F | 17 5 | | | | | | |

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| DATE | COMPONENT | PHASE | TIME | PERIODS | TRACE AMPLITUDE $A_N$ | $A_E$ | $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 8.74 | Z | i | 17h 35m 26s | 8 | | | 2.5 | |
| | | i | 17 45 22 | 11 | | | 2.0 | |
| | | i | 17 55 2 | 10 | | | 1.5 | |
| | | eL | 18 6 42 | 34 | | | | |
| | | M1 | 18 15 15 | 21 | | | 3.6 | |
| | | M2 | 18 20 33 | 16 | | | 5.5 | |
| | | M3 | 18 25 28 | 16 | | | 5.5 | |
| | | M4 | 18 34 9 | 14 | | | 5.0 | |
| | | M5 | 18 40 28 | 15 | | | 2.0 | |
| | | M6 | 18 45 34 | 15 | | | 3.0 | |
| | | M7 | 18 47 24 | 15 | | | 2.7 | |
| | | M8 | 18 50 21 | 15 | | | 1.5 | |
| | | M9 | 18 52 26 | 15 | | | 2.0 | |
| | | C | 18 56 0 | | | | | |
| | | F | obscured. | | | | | |
| 14.44 | Z | i | 10 20 3 | 5 | | | 1.1 | |
| | | eL | 10 40 31 | 20 | | | | |
| | | M1 | 10 47 5 | 14 | | | 8.0 | |
| | | M2 | 10 23 52 | 16 | | | 9.0 | |
| | | M3 | 11 1 28 | 12 | | | 3.0 | |
| | | M4 | 11 3 53 | 14 | | | 3.6 | |
| | | C | 11 21 | | | | | |
| | | F | 12 33 | | | | | |
| 16.90 | | eL | 21 30 13 | 25 | | | | |
| | | M1 | 21 36 33 | 18 | | | 2.0 | |
| | | M2 | 21 42 30 | 15 | | | 2.5 | |
| | | F | 22 14 | | | | | |
| 19.44 | Z | P? | 10 23 2 | | | | | |
| | | iP | 10 23 9 | | | | | |
| | | PR1 | 10 25 36 | | | | | |
| | | PR2 | 10 29 5 | | | | | |
| | | i | 10 31 27 | | | | | |
| | | i | 10 31 37 | | | | | |
| | | iS | 10 32 4 | | | | | |
| | | PS | 10 32 20 | | | | | |
| | | i | 10 32 57 | | | | | |
| | | SR1 | 10 35 26 | | | | | |
| | | (eL) | 10 36 18 | 48 | | | | Very irregular. |
| | | SR2? | 10 37 2 | | | | | |
| | | (M) | 10 45 46 | 35 | | | | greater than 12.5mm. |
| | | eL | 10 49 25 | 24 | | | | |
| | | M1 | 10 52 20 | 20 | | | 19.5 | |
| | | M2 | 10 0 22 | 18 | | | 5.0 | |
| | | M3 | 11 2 53 | 18 | | | 4.5 | |
| | | M4 | 11 7 29 | 16 | | | 4.5 | |
| | | M5 | 11 13 12 | 14 | | | 4.0 | |
| | | M6 | 11 22 5 | | | | 2.5 | |
| | | C | 11 23 0 | | | | | |
| | | W | 12 57 36 | | | | | Record changed 12h 4m |
| 20.69 | Z | i | 16 27 7 | 5 | | | 1.5 | |
| | | eL | 16 39 27 | | | | 1.0 | Irregular. |
| | | F | obscured. | | | | | |
| 21.48 | Z | eL | 11 27 31 | 28 | | | | |
| | | M1 | 11 30 34 | 24 | | | 1.5 | |
| | | M2 | 11 33 42 | 18 | | | 1.5 | |
| | | M3 | 11 37 38 | 17 | | | 1.6 | |
| | | M4 | 11 40 10 | 17 | | | 1.7 | |
| | | C | 11 43 | | | | | |
| | | F | obscured. | | | | | |
| 24.32 | Z | eL | 7 40 43 | 35 | | | | |
| | | M1 | 7 48 45 | 15 | | | 1.5 | |
| | | M2 | 7 58 13 | 16 | | | 2.5 | |
| | | F | 8 12 31 | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 110 | 4.9 | 1.3 |
| | $A_E$ | 106 | 5.2 | 1.3 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | --- | --- | --- |
| | $A_E$ | --- | --- | --- |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 27 | 10.1 | 1.3 |
| | $A_E$ | 53 | 8.5 | 1.2 |
| Bosch-Omori | $A_N$ | Removed to Weston | | |
| | $A_E$ | College, Weston, Mass. | | |

| Date Nov.'29 | COMPONENT Character | Phase | Time h m s | Periods s | TRACE Amplitude $A_N$ | $A_E$ | $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 4.70 | Z | $e_L$ | 16 33 15 | 24 | | | 1.5mm. | | |
| | | F | 17 10 | | | | | | |
| 5.58 | | | 13 50 Record inserted, quake already in progress. | | | | | | |
| | Z | M | 14 0 20 | 20 | | | 1.0mm. | | |
| | | F | 14 25 | | | | | | |
| 8.15 | Z | i | 3 30 59 | | | | | | |
| | | i | 3 33 49 | | | | | | |
| | | $e_L$ | 3 37 15 | 18 | | | | | |
| | | M | 3 43 55 | 18 | | | 6.0mm. | | |
| | | F | obscured by micros. | | | | | | |
| 9.08 | Z | $i_P$ | 1 50 57 | | | | 2.5 | | |
| | | $P_{R_1}$? | 1 52 36 | | | | 1.0 | | |
| | | $P_{R_2}$ | 1 55 1 | | | | 1.5 | | |
| | | S | 1 59 43 | | | | 2.0 | | |
| | | i | 2 8 22 | | | | 1.1 | | |
| | | i | 2 10 41 | | | | 1.5 | | |
| | | $e_L$ | 2 13 31 | 24 | | | | | |
| | | M | 2 22 29 | 16 | | | 5.0 | | |
| | | F | 3 53 | | | | | | |
| 13.08 | Z | $e_L$ | 1 48 0 | 24 | | | 2.0 | | |
| | | F | 2 10 obscured by micros. | | | | | | |
| 15.80 | Z | $e_P$ | 19 4 29 | | | | | | |
| | | $e_P$' | 19 8 42 | | | | | | |
| | | i | 19 10 52 | | | | | | |
| | | $P_{R_1}$ | 19 11 25 | | | | | | |
| | | $ScP_{cP}$ | 19 12 49 | | | | | | |
| | | $eScP_{cS}$ | 19 14 29 | | | | | | |
| | | e | 19 17 7 | 70.0 | | | | | |
| | | $eScP_{cP}S$ | 19 17 39 | | | | | | |
| | | $i_{P_S}$ | 19 20 55 | | | | | | |
| | | $P_{R_2}$ | 19 23 35 | | | | | | |
| | | i | 19 30 29 | | | | | | |
| | | i | 19 31 36 | | | | | | |
| | | i | 19 34 37 | | | | | | |
| | | $e_L$ | 19 34 0 | 25 | | | | | |
| | | $M_1$ | 19 52 39 | 26 | | | 26.0mm. | | |
| | | $M_2$ | 19 56 21 | ? | | | 50.0 | | |
| | | $M_3$ | 19 57 31 | 20 | | | 36.5 | | |
| | | $M_4$ | 20 0 29 | 18 | | | 24.5 | | |
| | | $M_5$ | 20 22 43 | 17 | | | 17.0 | | |
| | | $M_6$ | 20 23 45 | 16 | | | 20.0 | | |
| | | $M_7$ | 20 12 6 | 17 | | | 18.0 | | |
| | | $M_8$ | 20 15 13 | 17 | | | 20.7mm. | | |
| | | $M_9$ | 20 20 37 | 16 | | | 8.5 | | |
| | | $M_{10}$ | 20 22 7 | 17 | | | 9.0 | | |
| | | $M_{11}$ | 20 24 14 | 15 | | | 7.5 | | |
| | | $M_{12}$ | 20 25 17 | 16 | | | 14.5 | | |
| | | $M_{13}$ | 20 27 45 | 16 | | | 10.5 | | |
| | | $M_{14}$ | 20 34 0 | 15 | | | 11.5 | | |
| | | C | 20 35 | | | | | | |
| | | F | 23 54 | | | | | | |

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# Washington, D. C.

## Seismological Bulletin

### of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| Dec. 30, '29 | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 110 | 4.9 | 1.3 |
| | $A_E$ | 106 | 5.2 | 1.3 |
| | $A_Z$ | -- | -- | -- |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | -- | -- | -- |
| | $A_E$ | -- | -- | -- |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 27 | 10.1 | 1.3 |
| | $A_E$ | 53 | 8.5 | 1.2 |
| Bosch-Omori | $A_N$ | Removed to Weston | | |
| | $A_E$ | College, Weston, Mass. | | |

| Date December 1929 | Character | Phase | Time h m s | Periods s | Trace Amplitude mm. $A_N$ | $A_E$ | $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 4.23 | | $e_Z$ | 6 48 38 | 20 | | | 2.0 | | |
| | | F | 6 55 46 | | | | | | |
| | | $e_Z$ | 8 12 22 | 20 | | | 3.0 | | |
| | | F | 8 19 2 | | | | | | |
| 6.52 | | $eL_Z$ | 12 31 22 | 20 | | | 0.8 | | |
| | | F | 12 53 2 | | | | | | |
| 6.73 | | $e_Z$ | 17 4 12 | | | | | | |
| | | $i_Z$ | 17 14 37 | | | | | | |
| | | L | 17 43 53 | 24 | | | 3.0 | | |
| | | F | obscured by micros. | | | | | | |
| 6.86 | | $i_Z$ | 20 38 50 | | | | | | |
| | | $eL_Z$ | 21 17 43 | 22 | | | 3.3 | | |
| 9.28 | | $i_Z$ | 6 48 20 | | | | | | |
| | | $i_Z$ | 7 09 19 | | | | | | |
| | | ?Z | 7 12 | | | | | | obscured by clock. |
| | | $eL_Z$ | 8 03 33 | | | | | | |
| | | M | 8 15 24 | 20 | | | 9.3 | | |
| | | F | 9 15 | | | | | | |
| 13.39 | | $eL_Z$ | 9 21 27 | 22 | | | 1.7 | | |
| | | F | 9 44 17 | | | | | | |
| 14.20 | | $e_Z$ | 4 49 12 | | | | | | |
| | | $i_Z$ | 5 00 15 | | | | | | |
| | | $eL_Z$ | 5 10 05 | 20 | | | 1.5 | | |
| | | F | 5 28 38 | | | | | | |
| 14.95 | | $e_Z$ | 22 43 51 | 14 | | | 1.5 | | |
| | | $e_Z$ | 23 06 29 | 14 | | | 1.1 | | |
| | | F | 23 17 49 | | | | | | |
| 15.07 | | $eP_Z$ | 1 40 10 | | | | 1.0 | | |
| | | $iPR_{1Z}$ | 1 41 16 | | | | | | |
| | | $S_Z$? | 1 45 38 | | | | | | |
| | | $eSR_{1Z}$ | 1 48 33 | | | | | | |
| | | $iSR_{2Z}$ | 1 49 31 | | | | | | |
| | | $eL_Z$ | 1 52 11 | 18 | | | | Δ = 4600. | |
| | | $M_Z$ | 1 53 23 | 16 | | | | | |
| | | F | 2 13 49 | | | | | | |
| 15.63 | | $e_Z$ | 15 11 01 | 12 | | | 1.6 | | |
| | | F | 15 16 01 | | | | | | |
| 16.52 | | $e_Z$ | 12 28 37 | 24 | | | 4.0 | | |
| | | F | 12 46 31 | | | | | | |
| 17.47 | | $eP_E$ | 11 9 47 | | | | | | 200$^k$ Wiechert |
| | | $P_N$ | 11 9 48 | | | | | | " |
| | | $iP_Z$ | 11 9 53 | | | | | | Galitzin |
| | | $S_E$ | 11 19 3 | | | | | | 200$^k$ Wiechert |
| | | $S_N$ | 11 19 4 | | | | | | " |
| | | $S_{R1}$ | 11 24 1 | | | | | | " |
| | | $S_{R2_N}$ | 11 26 31 | | | | | | " |
| | | $S_{R2_E}$ | 11 27 11 | | | | | | " |
| | | $eL_N$ | 11 31 26 | | | | | | " |
| | | $eL_E$ | 11 31 27 | | | | | | " |
| | | $M_E$ | 11 37 11 | 19 | | | 8.4 | | " |

Wiechert record removed 13 h. 24 m., quake unfinished.

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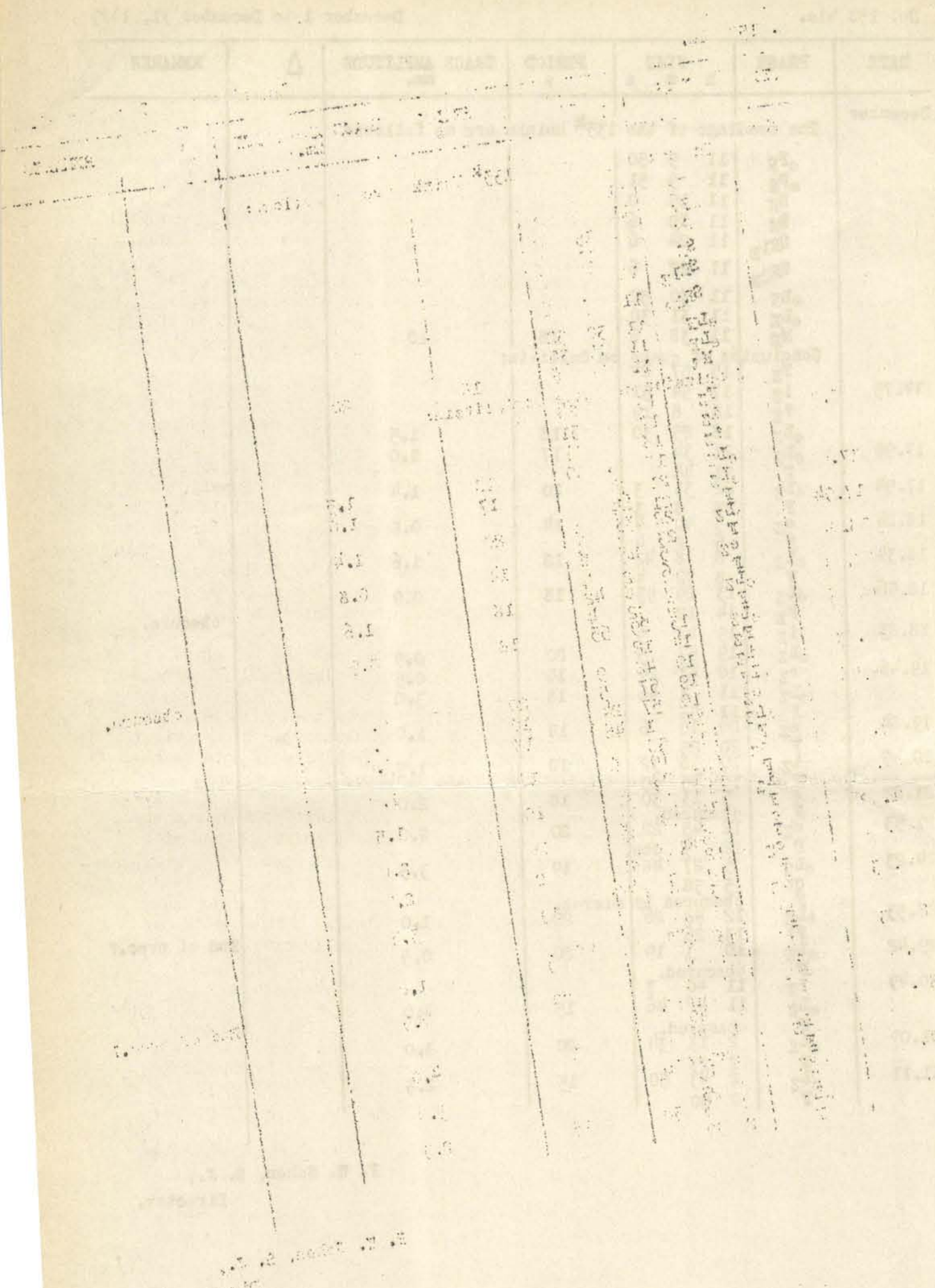
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| DATE | PHASE | TIME h m s | PERIOD s | TRACE AMPLITUDE mm. | Δ | REMARKS |
|---|---|---|---|---|---|---|
| December | The readings of the 135$^{k}$ Mainka are as follows: | | | | | |
| | $e^{P}_{N}$ | 11 9 50 | | | | |
| | $e^{P}_{E}$ | 11 9 51 | | | | |
| | $S_{N}$ | 11 19 0 | | | | |
| | $S_{E}$ | 11 19 6 | | | | |
| | $S_{R1_{E}}$ | 11 24 6 | | | | |
| | $S_{R2_{E}}$ | 11 27 6 | | | | |
| | $e^{L}_{N}$ | 11 30 52 | | | | |
| | $e^{L}_{E}$ | 11 31 30 | | | | |
| | $M_{E}$ | 11 38 6 | 18 | 22 | | |
| | Conclusion of quake on Galitzin: | | | | | |
| | $F_{Z}$ | 15 57 24 | | | | |
| 17.75 | $i_{Z}$ | 17 54 51 | | | | |
| | $?_{Z}$ | 18 8 19 | | | | |
| | $e^{L}_{Z}$ | 18 25 30 | 18 | 1.5 | | |
| 17.90 | $e^{L}_{Z}$ | 21 34 | 17 | 1.0 | | |
| | F | 21 44 | | | | |
| 17.94 | $e^{L}_{Z}$ | 22 33 3 | 20 | 1.4 | | |
| | F | 23 8 3 | | | | |
| 18.24 | $e_{Z}$ | 5 40 4 | 14 | 0.8 | | |
| | F | 6 2 4 | | | | |
| 18.34 | $e^{L}_{Z}$ | 8 8 42 | 18 | 1.6 | | |
| | F | 8 32 4 | | | | |
| 18.56 | $e^{L}_{Z}$ | 13 29 55 | 18 | 0.9 | | |
| | $F_{Z}$ | 14 12 | | | | |
| 18.83 | $i_{Z}$ | 19 48 9 | | | | obscure. |
| | $e^{L}_{Z}$ | 19 57 5 | 20 | 0.9 | | |
| 19.46 | $e_{Z}$ | 10 57 24 | 10 | 0.5 | | |
| | $e^{L}_{Z}$ | 11 1 46 | 18 | 3.0 | | |
| | F | 11 58 | | | | |
| 19.84 | $e_{Z}$ | 20 10 6 | 18 | 1.0 | | |
| | F | 20 25 | | | | |
| 20.45 | $i_{Z}$ | 10 38 32 | 10 | 1.5 | | |
| | F | 10 45 00 | | | | |
| 21.22 | e | 5 13 30 | 18 | 2.0 | | |
| | F | obscured. | | | | |
| 21.53 | $e_{Z}$ | 12 45 22 | 20 | 2.0 | | |
| | F | 12 3 obs. | | | | |
| 24.23 | $e^{L}_{Z}$ | 5 27 46 | 19 | 3.5 | | |
| | C? | 5 58 | | | | |
| | F | obscured by micros. | | | | |
| 28.53 | $e^{L}_{Z}$ | 12 42 26 | 20 | 1.0 | | |
| | F? | 13 26 | | | | |
| 29.42 | $e^{L}_{Z}$ | 10 3 19 | 20 | 0.5 | | End of prec.? |
| | F | obscured. | | | | |
| 30.49 | $?_{Z}$ | 11 40 7 | | | | |
| | $e^{L}_{Z}$ | 11 46 46 | 15 | 4.0 | | |
| | F | obscured. | | | | |
| 31.09 | $e^{L}_{Z}$ | 2 13 34 | 20 | 3.0 | | |
| | F | 2 23 | | | | |
| 31.11 | $e^{L}_{Z}$ | 2 43 50 | 15 | 2.5 | | |
| | F | 2 50 | | | | |

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*From* January 1 *to* January 31, *19*30

# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| Dec. 30, '29 | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 110 | 4.9 | 1.3 |
| | $A_E$ | 106 | 5.2 | 1.3 |
| | $A_Z$ | — | — — | — — |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | — | — | — |
| | $A_E$ | — | — | — |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 27 | 10.1 | 1.3 |
| | $A_E$ | 53 | 8.5 | 1.2 |
| Bosch-Omori | $A_N$ | Removed to Weston College, Weston, Mass. | | |
| | $A_E$ | | | |

| Date January, 1930 | Component ~~Character~~ XXXXXXX | Phase | Time h m s | Periods s | TRACE Amplitude $A_N$ | $A_E$ | $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 5.06 | Z | eP | 1 31 43 | | | | | | Identification of phases uncertain. |
| | | i? | 1 32 24 | | | | 2.6mm. | | |
| | | $i_S$? | 1 38 19 | | | | 1.6 | | |
| | | e? | 1 40 51 | | | | | | |
| | | $i_{SR_1}$ | 1 42 25 | | | | 2.0 | | |
| | | $e_{SR_2}$ | 1 43 31 | | | | | | |
| | | $e_L$ | 1 46 21 | 17 | | | 1.5 | | |
| | | F | 2 47 | | | | | | |
| 5.80 | Z | i | 19 5 0 | | | | 2.5 | | |
| | | i | 19 8 28 | | | | | | |
| | | $e_L$ | 19 38 8 | | | | 0.9 | | |
| | | F | 20 5 | | | | | | |
| 7.07 | Z | $e_L$ | 0 41 32 | 16 | | | | | 1.5mm(Record dated Jan. 6) |
| | | F | 0 59 | | | | | | |
| 8.60 | Z | ?i | 14 23 21 | | | | 1.1mm. | | |
| | | $e_L$ | 14 27 38 | 16 | | | 1.2 | | |
| | | F | 14 59 | | | | | | |
| 12.24 | Z | e | 5 40 | | | | | | |
| | | $e_L$? | 5 42 36 | 18 | | | | | |
| | | $M_1$ | 5 43 50 | 8 | | | 8.5mm. | | |
| | | $M_2$ | 5 45 29 | 10 | | | 6.5 | | |
| | | F | 5 54 | | | | | | |
| 13.25 | Z | $e_L$ | 5 49 36 | 16 | | | 2.0 | | |
| | | F obscured | | | | | | | |
| 14.92 | Z | i | 21 55 1 | 12 | | | 2.5 | | |
| 14.95 | Z | F | 21 56 22 | | | | | | |
| | | e | 22 44 53 | | | | | | |
| | | i | 22 45 25 | | | | | | |
| | | i | 22 49 5 | | | | | | |
| | | $e_L$ | 22 51 41 | 24 | | | | | |
| | | $M_1$ | 22 56 23 | 23 | | | 3.0mm. | | |
| | | $M_2$ | 22 59 17 | 18 | | | 2.5 | | |
| | | $M_4$ | 23 4 47 | 18 | | | 2.5 | | |
| | | C | 23 29 | | | | | | |
| | | F | 23 51 | | | | | | |
| 15.50 | Z | iP | 11 50 44 | | | | 1.5mm. | | |
| | | $i_S$ | 11 55 28 | | | | 2.0 | | |
| | | $e_L$ | 11 58 30 | 15 | | | 1.2 | | |
| | | F | 12 7 | | | | | | |
| 16.01 | Z | | 0 12 | A small quake concealed by micros appears to have been in progress when the record was changed. | | | | | |
| | | i | 0 21 41 | | | | | | |
| | | i | 0 29 48 | | | | | | |
| | | i | 0 35 22 | | | | | | |
| 16.03 | | e | 0 38 35 | | | | | | |
| | | i | 0 40 11 | | | | 1.0mm. | | |
| | | i | 0 41 16 | | | | 2.0 | | |
| | | $e_L$? | 0 42 20 | | | | | | |
| | | M | 0 44 14 | 13.5 | | | 10.0 | | |
| | | F | 1 0 20 | | | | | | |
| 17.72 | Z | ? | 17 2 4 | | | | | | |
| | | $i_P$ | 17 3 43 | | | | 3mm. | | |
| | | i? | 17 8 8 | | | | | | |
| | | $e_S$ | 17 10 48 | 12. | | | 2 | | |
| | | i? | 17 11 26 | | | | | | |
| | | $S_{R_1}$ | 17 13 48 | | | | | | |
| | | i? | 17 15 33 | | | | | | |

continued January bis.

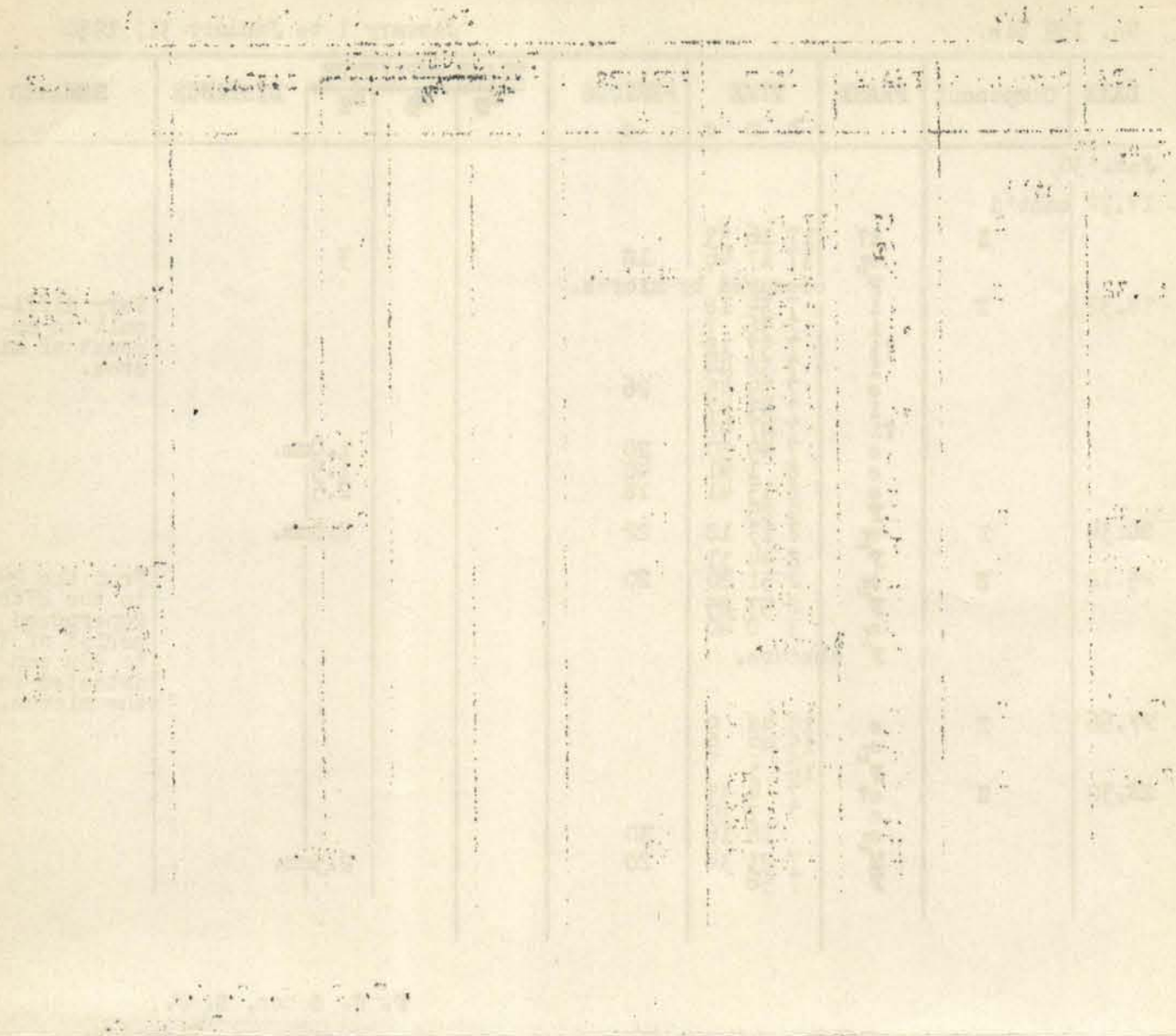
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| DATE | Component | PHASE | TIME h m s | PERIODS s | TRACE AMPLITUDE $A_N$ | $A_E$ | $A_Z$ | DISTANCE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| Jan.'30 | | | | | | | | | |
| 17.72 | cont'd | | | | | | | | |
| | Z | i? | 17 16 33 | | | | | | |
| | | $e_L$ | 17 17 46 | 18 | | | 3 | | |
| | | F | obscured by micros. | | | | | | |
| 18.32 | Z | i | 7 34 18 | | | | | | Very difficult on account of micros. |
| | | i | 7 36 7 | | | | | | |
| | | ?i | 7 37 18 | | | | | | |
| | | i | 7 38 44 | | | | | | |
| | | e | 7 39 45 | 26 | | | | | |
| | | i | 7 43 47 | | | | | | |
| | | ?i | 7 47 42 | | | | | | |
| | | e | 7 49 50 | 20 | | | 1.0mm. | | |
| | | e | 8 1 41 | 40 | | | 1.5 | | |
| | | e | 8 13 41 | 18 | | | 2.5 | | |
| | | F | 9 25 | | | | | | |
| 20.34 | Z | $e_L$ | 8 13 18 | 22 | | | 2.0mm. | | |
| | | F | 8 44 31 | | | | | | |
| 25.12 | Z | $e_L$ | 2 51 20 | 20 | | | | | From the 24th to the 27th superposed period of 30 to 40s can be detected in the micros. |
| | | F | 2 57 25 | | | | | | |
| | | $e_L$ | 3 0 40 | | | | | | |
| | | F | obscure. | | | | | | |
| 27.66 | Z | e | 15 48 9 | | | | | | |
| | | $e_L$ | 15 49 9 | | | | | | |
| | | F | 16 1 | | | | | | |
| 28.30 | Z | e? | 7 4 33 | | | | | | |
| | | e | 7 7 30 | | | | | | |
| | | $e_L$ | 16 16 | 30 | | | | | |
| | | M | 7 23 34 | 20 | | | 2.5mm. | | |
| | | F | 7 56 | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 110 | 4.9 | 1.3 |
| | $A_E$ | 106 | 5.2 | 1.3 |
| | $A_Z$ | --- | --- | --- |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 27 | 10.1 | 1.3 |
| | $A_E$ | 53 | 8.5 | 1.2 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

Galitzin Vertical T= 9.25.  Mu = .013,  $\frac{kA_1T}{4\pi} = 977$

| Date Feb. 1930 | Character COMPONENT | Phase | Time | Periods | Amplitude $T_{max}$ $A_N$ | $A_E$ | $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 1.80 | Z | PR1? | 19h 5m 10s | | | | | | Heavy micros. |
| | | eS? | 19 10 13 | | | | | | |
| | | ? | 19 15 11 | | | | | | |
| | | e | 19 15 33 | 10 | | | | | |
| | | i? | 19 15 41 | | | | 4.0mm. | | |
| | | i | 19 15 17 | | | | 5.0 | | |
| | | eL | 19 17 40 | 28 | | | | | |
| | | F | obscured. | | | | | | |
| 2.63 | Z | P | 15h 6m 57s | 7s | | | 4.0mm. | | |
| | | ePR1 | 15 9 18 | 8 | | | 4.0 | | |
| | | ePR2 | 15 10 18 | 7 | | | 3.0 | | |
| | | eS | 15 15 29 | 15 | | | | | |
| | | PS | 15 16 6 | | | | | | |
| | | PPS | 15 16 45 | | | | 3.7 | | |
| | | e | 15 17 16 | | | | 4.0 | | |
| | | eL | 15 29 53 | 40 | | | | | |
| | | M1 | 15 38 5 | 17 | | | 18.3 | | |
| | | M2 | 15 40 30 | 15 | | | 13.2 | | |
| | | M3 | 15 42 6 | 15 | | | 14.5 | | |
| | | M4 | 15 43 25 | 10 | | | 7.8 | | |
| | | M5 | 15 44 25 | 15 | | | 11.1 | | |
| | | M6 | 15 46 55 | 15 | | | 7.6 | | |
| | | M7 | 15 48 3 | 10 | | | 7.1 | | |
| | | M8 | 15 50 35 | 15 | | | 8.2 | | |
| | | M9 | 15 51 25 | 15 | | | 10.0 | | |
| | | C | 15 53 | | | | | | |
| | | F | 16 42 | obscured. | | | | | |
| 3.96 | Z | eL | 22 54 25 | 27 | | | | | |
| | | M | 23 1 40 | 14 | | | | | |
| | | F | 23 5 0 | | | | | | |
| 7.30 | Z | eL | 7 12 57 | 27 | | | | | |
| | | M | 7 18 15 | 17 | | | 4.0mm. | | |
| | | F | obscured. | | | | | | |
| 9.06 | Z | e | 1 30 ? | 10 | | | | | |
| | | i | 1 32 7 | 12 | | | 4.5 | | |
| | | i | 1 32 47 | 12 | | | 3.0 | | |
| | | i | 1 34 | 7 | | | 3.5 | | obscured by clock. |
| | | F? | 1 35 10 | | | | | | |
| 12.28 | Z | eP' | 6 42 19 | 6 | | | | | |
| | | PR1 | 6 44 3 | 6 | | | 1.5 | | |
| | | PR2 | 6 46 44 | 10 | | | 0.8 | | |
| | | SKS | 6 49 14 | 10 | | | 1.0 | | K (for Kernwelle) is written in place of $_cP_c$ |
| | | SKKS? | 6 50 38 | 10 | | | 0.5 | | |
| | | ? | 6 51 43 | 10 | | | 1.0 | | |
| | | i | 6 52 49 | | | | 1.5 | | |
| | | PS | 6 54 3 | 8 | | | 1.5 | | |
| | | SKSP | 6 54 31 | 8 | | | 1.0 | | |
| | | PPS | 6 55 | 6 | | | 2.3 | | |
| | | PPSS | 6 56 24 | 7 | | | 1.4 | | obscured by clock. |
| | | eSR1 | 7 1 50 | 12 | | | 0.5 | | |
| | | eSR2 | 7 7 19 | 15 | | | 1.0 | | |
| | | eL | 7 23 1 | 22 | | | | | |
| | | M1 | 7 27 34 | 21 | | | 3.0 | | |
| | | M2 | 7 31 18 | 18 | | | 2.5 | | |
| | | M3 | 7 34 32 | 20 | | | 2.0 | | |
| | | M4 | 7 38 32 | 15 | | | 2.0 | | |
| | | M5 | 7 42 44 | 18 | | | 2.5 | | |
| | | M6 | 7 47 45 | 15 | | | 2.0 | | |
| | | M8 | 7 58 38 | 13 | | | 1.7 | | |
| | | C | 8 5 35 | | | | | | |
| | | W2,1 | 8 28 51 | 1 | | | | | |
| | | W2,2 | 8 31 34 | | | | | | |
| | | W2,3 | 8 35 20 | | | | | | |
| | | W2,4 | 8 40 2 | | | | | | |
| | | W2,5 | 8 42 0 | | | | | | |
| | | W2,6 | 8 48 53 | | | | | | |

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| DATE | COMPONENT | PHASE | TIME | PERIODS | TRACE AMPLITUDE $A_N$ | $A_E$ | $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 14.78 | Z | i | 18h 49m 54s | 5.0 | | | 5.0 | |
| | | i | 18 50 17 | 5.0 | | | 4.3 | |
| | | C | 18 50 39 | over lapping the following | | | | |
| 14.79 | Z | i | 18 59 29 | 7.0 | | | 4.5 | |
| | | i | 19 0 04 | 7.0 | | | 6.0 | |
| | | i | 19 0 41 | 8.0 | | | 3.8 | |
| | | eL | 19 15 24 | 20 | | | | |
| | | M | 19 23 24 | 20 | | | 2.0 | |
| | | F | 19 37 | | | | | |
| 14.875 | Z | iP | 20 59 50 | 5 | | | 1.5mm | Identification of phases based on conjecture of two shocks. |
| | | i | 21 0 24 | 8 | | | 2.0 | |
| | | PR1 | 21 3 4 | 8 | | | 1.1 | |
| (14.880) | | (eP) | 21 6 39 | 5 | | | 1.5 | |
| | | (iPR1) | 21 9 38 | | | | 1.5 | |
| | | S | 21 9 41 | 10 | | | 1.5 | |
| | | iPS | 21 10 38 | 8 | | | 2.0 | |
| | | (ePR2) | 21 11 13 | 8 | | | 1.5 | |
| | | ? | 21 15 22 | 8 | | | 1.5 | |
| | | (S) | 21 16 19 | 12 | | | 1.5 | |
| | | (ePS) | 21 17 9 | 8 | | | 1.5 | |
| | | PKKP | 21 18 42 | 6 | | | 1.5 | K written for $\overline{cPc}$ |
| | | SR2 | 21 19 16 | 12 | | | 1.0 | |
| | | (SR1) | 21 21 4 | 9 | | | 1.8 | |
| | | e | 21 24 28 | 15 | | | 1.7 | |
| | | eL | 21 24 56 | 30 | | | | |
| | | i | 21 28 20 | 4 | | | 2.1 | |
| | | M | 21 29 40 | 15 | | | 1.5 | |
| | | (eL) | 21 33 16 | 28 | | | | |
| | | (M1) | 21 42 14 | 18 | | | 5.0 | |
| | | (M2) | 21 55 15 | 15 | | | 5.5 | |
| | | (M3) | 22 3 18 | 15 | | | 3.0 | |
| | | (M4) | 22 5 46 | 15 | | | 2.0 | |
| | | (M5) | 22 7 9 | 15 | | | 2.0 | |
| | | (M6) | 22 6 10 | 15 | | | 2.5 | |
| | | (M7) | 22 12 12 | 17 | | | 1.7 | |
| | | (M8) | 22 14 42 | 15 | | | 1.5 | |
| | | (M9) | 22 19 1 | 14 | | | 2.0 | |
| | | (M10) | 22 23 37 | 15 | | | 2.0 | |
| | | (M11) | 22 25 47 | 15 | | | 2.0 | |
| | | (M12) | 22 32 34 | 15 | | | 1.4 | |
| | | C | 22 34 54 | | | | | |
| | | F | 22 31 | | | | | |
| 20.80 | | Circa | 19 6 | The pile driving began for the new building on the campus. | | | | |
| 23.29 | Z | eL | 7 3 25 | 20 | | | 1mm. | |
| | | F | 7 18 | | | | | |
| 23.79 | Z | eL | 19 0 18 | 20 | | | 1.5 | |
| | | F | 19 18 | | | | | |
| 24.89 | Z | e | 21 10 32 | 5 | | | 1.5 | |
| | | i | 21 13 10 | 7 | | | 1.8 | |
| | | i | 21 14 19 | | | | 1.5 | |
| | | eL | 21 22 49 | 20 | | | 1.0 | |
| | | F | 21 50 | | | | | |
| 24.92 | Z | eL | 22 1 14 | 20 | | | 1.0mm. | |
| | | F | obscured. | | | | | |
| 25.49 | Z | eL | 11 31 45 | 30 | | | 0.5 | |
| | | F | obscured. | | | | | |
| 26.10 | Z | i | 2 45 57 | 5 | | | | |
| | | i | 2 46 35 | | | | | |
| | | i? | 2 47 15 | 12 | | | | |
| | | i | 2 48 22 | 8 | | | | Overlaps the following: |
| 26.16 | Z | eP | 3 38 27 | | | | | Corresponds to Brawley's second main shock. |
| | | S | 3 42 obscured by clock | | | | | |
| | | -- | 4 40 27 | | | | | |
| 26.24 | Z | e | 5 35 41 | | | | | |
| 26.33 | Z | iP | 7 54 36 | 5 | | | 1.0 | |
| | | eS | 7 56 53 | 8 | | | 1.0 | |

There are also a great number of smaller shocks badly obscured by micros.

The shocks were also recorded on the EW components of the Wiechert and Mainka, but there was no sign of disturbance on the N.S. components of either instrument.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 27.31 | Z | eL | 7 30 1 | | | | | |
| | | M | 7 33 20 | 12 | | | 2.0 | |
| | | F | obscured. | | | | | |
| 28.05 | Z | i | 1 6 24 | | | | | |
| | | eL | 1 14 14 | | | | | |
| | | F | obscured. | | | | | |
| 28.79 | Z | eL | 19 0 41 | 35 | | | | |
| | | M1 | 19 4 43 | 17 | | | 2.0 | |
| | | M2 | 19 9 30 | 17 | | | 3.0 | |
| | | F | 19 15 47 | | | | | |

The readings given in these bulletins are taken from the 7 kg. vertical component of the Galitzin seismograph supplied by Cambridge and Paul. The constants as determined February 15, 1930 are as follows:

Undamped period of galvonometer $T_1$ = 9.14 seconds.
Undamped period of Pendulum $T$ = 9.25 seconds.
Damping $Mu^2$ = .013
Transfer factor $k$ = 327
Reduced pendulum length $l$ = 41.09 cm.
Distance galv. mirror to drum $A_1$ = 166.5 cm.
Synchronous Magnification* $\frac{kA_1T}{4\pi l}$ = 977

Paper speed 39mm. per min. at beginning, 27mm. per min. at end of record (12 hrs.)
* By Synchronous Magnification is meant the actual magnification for a simple harmonic motion of the same period as that of the pendulum, namely, 9.25 seconds.

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Director.

International Seismological Centre From the ISC collection scanned by SISMOS



# Washington, D. C.

## Seismological Bulletin

### of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 110 | 4.9 | 1.3 |
| | $A_E$ | 106 | 5.2 | 1.3 |
| | $A_Z$ | --- | --- | --- |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 27 | 10.1 | 1.3 |
| | $A_E$ | 53 | 8.5 | 1.2 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

Galitzin Vertical T = 9.25, Mu = .013, $\frac{kA_1T}{4\pi^2}$ = 977

| Date Mar. 1930 | Character COMPONENT | Phase | Time | Periods | Trace Amplitude $A_N$ | Trace Amplitude $A_E$ | Trace Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 2.00 | Z | e | 0h 0m 28s | | | | | | |
| | | i | 0 3 0 | | | | | | |
| 6.67 | Z | e | 15 55 3 | | | | | | |
| | | i | 15 54 39 | | | | | | |
| | | e | 16 4 39 | | | | | | |
| | | eL | 16 33 9 | 24 | | | | | |
| | | M1 | 16 41 39 | 18 | | | 3.0 | | |
| | | M2 | 16 47 44 | 18 | | | 2.3 | | |
| | | M3 | 16 52 7 | 18 | | | 2.5 | | |
| | | M4 | 16 56 36 | 18 | | | 2.4 | | |
| | | M5 | 17 4 5 | 17 | | | 1.8 | | |
| | | F | 18 9 | | | | | | |
| 7.50 | Z | eL | 11 59 38 | 20 | | | | | |
| | | F | 12 | | | | | | |
| 8.17 | Z | eP | 3 51 33 | 6 | | | | | |
| | | i | 3 31 48 | 5 | | | 3.0 | | |
| | | PR1? | 3 52 5 | 6 | | | 3.2 | | |
| | | eS | 3 56 25 | | | | | | |
| | | i | 3 56 41 | | | | | | |
| | | (eL) | 3 58 45 | 36 | | | | | |
| | | eL | 3 59 40 | 30 | | | | | |
| | | M1 | 4 30 27 | | | | 3.6 | | |
| | | M2 | 4 7 19 | | | | | | |
| | | C | 4 20 | | | | | | |
| | | F | 4 51 | | | | | | |
| 10.61 | Z | eL | 14 33 25 | 25 | | | | | |
| | | M | 14 34 58 | 20 | | | 1.0mm. | | |
| | | F | 14 46 35 | | | | | | |
| 10.72 | Z | iP | 16 38 51 | | | | 2.5 | | |
| | | PR1? | 16 42 10 | | | | | | |
| | | iS | 16 48 17 | | | | 2.0 | | |
| | | eL | 17 5 31 | 20 | | | | | |
| | | M | 17 14 30 | 20 | | | 1.1 | | |
| | | F | 17 27 | | | | | | |
| 24.51 | Z | eL | 12 23 36 | 18 | | | 0.6mm. | | |
| | | | 12 42 | Record changed. | | | | | |
| 26.30 | Z | P | 7 28 56 | 5 | | | 1.0 | | |
| | | P' | 7 31 35 | 5 | | | 2.5 | | |
| | | i | 7 31 53 | 5 | | | 7.0 | | |
| | | PR1 | 7 34 52 | 9 | | | 8.0 | | |
| | | SKP | 7 35 39 | 10 | | | 8.0 | | K written for $\frac{P}{cP_c}$ |
| | | PR2 | 7 38 8 | 8 | | | 5.0 | | |
| | | SKS | 7 38 52 | 12 | | | 4.0 | | |
| | | PR3 | 7 41 8 | 5 | | | 5.5 | | |
| | | PR4 | 7 42 4 | 5 | | | 3.5 | | |
| | | i | 7 43 38 | 11 | | | 3.5 | | |
| | | PSKS | 7 44 52 | 9 | | | 2.5 | | |
| | | (eL) | 7 45 18 | 24 | | | | | |
| | | PS | 7 45 40 | 5 | | | 2.5 | | |
| | | PPS | 7 47 10 | 9 | | | 5.0 | | |
| | | ePPPS | 7 48 22 | 14 | | | 5.0 | | |
| | | i | 7 49 0 | 12 | | | 5.0 | | |
| | | SR1 | 7 53 4 | 12 | | | 3.7 | | |
| | | PSSS | 7 58 20 | 10 | | | 3.8 | | |
| | | SR2 | 7 59 6 | 15 | | | | | |
| | | i | 8 0 28 | 10 | | | 5.0 | | |
| | | i | 8 1 38 | 10 | | | 3.5 | | |

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| DATE | COMPONENT | PHASE | TIME | PERIODS | TRACE AMPLITUDE $A_N$ | $A_E$ | $A_Z$ | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 26.30 continued | | | | | | | | |
| | Z | eSR3 | 8h 3m 30s | 16 | | | 2.5 | |
| | | i | 8 6 4 | 10 | | | 5.0 | |
| | | eL | 8 7 52 | 40 | | | | Perhaps even earlier. |
| | | PPSS' | 8 8 32 | 15 | | | 2.5 | |
| | | i | 8 10 20 | ? | | | 5.0 | |
| | | M1 | 8 22 55 | 30 | | | 5.0 | |
| | | etc. | | | | | | |
| | | C | 9 28 | | | | | |
| | | F | lost in micros circa 12h. | | | | | |
| 29.36 | Z | P | 8h 44m 19s | | | | | |
| | | eS | 8 53 9 | | | | | |
| | | eL | 9 14 9 | 20 | | | | Earlier? |
| | | M1 | 9 20 49 | 20 | | | 1.5mm. | |
| | | M2 | 9 29 2 | 18 | | | 1.5 | |
| | | F | obscured. | | | | | |
| 29.44 | | eL | 10 23 4 | 25 | | | | |
| | | F | 10 44 | | | | | |
| 30.66 | Z | P | 15 38 55 | | | | | Identification phases uncertain. |
| | | i | 15 39 53 | | | | | |
| | | p' | 15 42 5 | | | | | |
| | | i | 15 43 20 | | | | | |
| | | PR1 | 15 44 11 | | | | | |
| | | SKS | 15 49 19 | | | | | |
| | | ? | 15 50 34 | | | | | |
| | | eL? | 15 53 27 | 20 | | | | |
| | | ? | 15 54 6 | | | | | |
| | | PS | 15 55 26 | | | | | |
| | | PPS | 15 56 30 | | | | | |
| | | e | 16 0 37 | 15 | | | | |
| | | eL | 16 27 23 | 41 | | | | |
| | | M1 | 16 36 28 | 22 | | | 1.5mm. | |
| | | M2 | 16 49 19 | 20 | | | 1.0 | |
| | | M3 | 17 8 6 | 20 | | | 1.0 | |
| | | C | 17 10 | | | | | |
| | | F | 17 29 | | | | | |
| 31.55 | Z | eL | 13 12 22 | 20 | | | | |
| | | M | 13 21 | | | | | |
| | | F | 13 37 | | | | | |

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| ,30,1930 | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | A | 109 | 4.8 | 1.28 |
| | $A_E$ | 116 | 5.0 | 1.19 |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 200 | 10.5 | 1.83 |
| | $A_E$ | 214 | 10.1 | 3.69 |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

Galitzin Vertical Apr. 26, '30
$T_1$ = 9.14, T = 8.92
$KA_1T$ = 904, $\mu^2$ = .06
$4\pi^2$

Synchronous Magnification

| Date April, 1930 | Character COMPONENT | Phase | Time | Periods | Trace Amplitude $A_N$ | $A_E$ | $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 10.64 | Z | eL | 15h 16m 9s | 19 | | | | | |
| | | M1 | 15 21 9 | 18 | | | 1.0mm. | | |
| | | M2 | 15 23 10 | 17 | | | 0.5 | | |
| | | M3 | 15 28 20 | 15 | | | 1.0 | | |
| | | F | 15 46 | | | | | | |
| 13.05 | Z | eL | 1 16 49 | 18 | | | 1.0 | | |
| | | F | obscured. | | | | | | |
| 13.17 | Z | eL | 3 51 45 | 10 | | | 1.1 | | |
| | | F | 3 52 48 | | | | | | |
| 15.49 | Z | eL | 11 41 59 | 20 | | | 0.4 | | |
| | | F | 12 7 39 | | | | | | |
| 16.59 | Z | eL | 14 4 9 | | | | | | |
| | | F | 14 19 -- | | | | | | |
| 16.61 | Z | i | 14 37 6 | | | | | | |
| | | i | 14 39 32 | | | | | | |
| | | e | 14 46 52 | | | | | | |
| | | i | 14 48 40 | | | | | | |
| | | i | 14 50 59 | | | | | | |
| | | i | 14 51 47 | | | | | | |
| | | eL | 14 52 24 | 23 | | | | | |
| | | M1 | 14 55 5 | 13 | | | 17.5mm. | | |
| | | M2 | 14 57 39 | 9 | | | 5.5 | | |
| | | M3 | 15 0 21 | 9 | | | 4.5 | | |
| | | M4 | 15 2 15 | 7 | | | 4.0 | | |
| | | F | 15 31 | | | | | | |
| 17.21 to 17.55 drum not revolving. | | | | | | | | | |
| 17.86 | Z | i | 20 38 1 | 4 | | | | | |
| | | eL | 20 50 29 | 20 | | | 0.6 | | |
| | | M | 21 1 | | | | | | |
| 20.99 to 21.53 | | | | | | | | | |
| 22.50 to 23.05 Vertical Galitzin out of commission. | | | | | | | | | |
| 23.32 to 26.72 | | | | | | | | | |
| 27.00 Quake lost in changing record. | | | | | | | | | |
| 27.61 | Z | iP | 14 45 56 | 4 | | | 2.5 | | |
| | | iS | 14 49 14 | 8 | | | 1.1 | | |
| | | eL | 14 50 6 | 17 | | | | | |
| | | F | obscured | | | | | | |
| 27.66 | Z | eL | 15 39 48 | 24 | | | | | |
| | | M1 | 15 49 15 | 18 | | | 1.1 | | |
| | | M2 | 15 50 54 | 17 | | | 1.0 | | |
| | | M3 | 16 2 48 | 16 | | | 0.6 | | |
| | | M4 | 16 4 24 | 15 | | | 0.5 | | |
| | | F | obscured. | | | | | | |
| 28.57 | Z | eL | 13 44 1 | 20 | | | 0.5 | | |
| | | F | 13 57 | | | | | | |
| 28.60 | Z | eL | 14 17 9 | 18 | | | 0.8 | | |
| | | F | 14 22 38 | | | | | | |
| 28.80 | Z | eL | 19 19 36 | 30 | | | | | |
| | | M1 | 19 43 46 | 16 | | | 1.6 | | |
| | | M2 | 19 49 31 | 15 | | | 2.5 | | |
| | | M3 | 19 57 43 | 15 | | | 1.5 | | |
| | | F | 20 26 | | | | | | |
| 30.70 | Z | i | 16 34 3 | | | | | | |
| | | i | 16 34 23 | | | | | | |
| | | eL | 16 58 48 | | | | | | |
| | | M1 | 17 3 33 | 20 | | | 0.6 | | |
| | | M2 | 17 10 49 | 17 | | | 0.5 | | |
| | | F | obscured. | | | | | | |

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | A | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ $A_E$ $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|

| DATE 1930 May | INSTRUMENT Component | PHASE | ARRIVAL TIME | REMARKS |
|---|---|---|---|---|
| 5.59 | G-Z | PR1 | 14h 6.54m | preceded by two e's |
| | | PR2 | 9.16 | also others |
| | | i | 14.42 | |
| | | PS | 16.43 | |
| | | iPPS | 17.33 | |
| | | No distinct S phases | | |
| | | L tangled but legible | | |
| | | W3 | 14h 236.4m | |
| 8.54 | G-Z | i | 13h 6.91m | dil. |
| | | e | 10.1 | |
| | | L not conspicuous | | |
| 8.66 | G-Z | i | 15h 48.15m | dil. |
| | | e | 58.81 | |
| 10.94 | G-Z | e | 22h 26.83m | |
| | | i | 27.39 | |
| | | e | 28.3 | |
| | | Period of Main Phase 0.20m | | |
| 21.93 | G-Z | i | 22h 16.25m | |
| | | i | 17.62 | |
| 31.44 | G-Z | i | 10h 29.24 | |

Earthquakes without distinct phases:
1.04, 1.46, 2.07 overlapping 2.16, 2.29, 3.03, 3.56, 3.68, 7.02 (beginning lost) 8.58, 9.83, 11.98, 12.96, 13.37, 13.77, 14.84, 20.48, 22.72, 24.63, 24.76, 24.79.

Records lost or vitiated:
6.64 to 7.0, 16.0 to 16.5, 18.0 to 18.5, 19.0 to 19.5, 25.0 to 26.0, 26.5 to 27.0, 27.5 to 28.0, 29.5 to 30.0, 31.5 to 32.0.

G-Z is vertical Galitzin. Constants April 26, 1930
$T_1$ = 9.14  T = 8.92  $Mu^2$ = .06  Synchronous Magnification = 904.
Spindler & Hoyer Clock, corrected daily by Arlington.

Do you wish to continue to receive the Bulletin (Instrumental Readings)?
What other information do you want besides that given in this issue?
Do you wish to continue to receive the Dispatches?
Is your address correct? We are revising our mailing list. Those not heard from will not receive the September issue to be mailed Oct. 14th.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date June 1930 | ~~Character~~ Phase Instrument | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1.57* | G - Z | e | 13h 37.1m# | | | | | |
| | | i | 43.27 | | | | | |
| | | eL | 55.4 | | | | | |
| | | M | 67.0 | | | | | |
| 5.50 | G - Z | i | 12h 02.39m | | | | | |
| | | e | 11.60 | | | | | |
| | | i | 12.50 | | | | | |
| | | L | 36.0 | | | | | |
| 11.05 | G - Z | iP¹ | 1h 8.82M | | | | | |
| | | $P_cP_cS$ | 12.36 | | | | | |
| | | $S_cP_cP_cS$ | 22.0 | | | | 140°(?) | |
| 13.05 | G - Z | iP | 1h 4.18M | | | | | Com- |
| | | eS | 12. 6 | | | | 62° | pressin |
| | | eL | 25.0 | | | | | |
| | | M | 34.0 | | | | | |
| 25.44 | G - Z | iP | 10h 27.13m | | | | | Comp. |
| | | i | 29.16 | | | | | |
| | | eS | 35.0 | | | | 57° | |
| | | eL | 39.3 | | | | | Over- lapng nxt q. dil. |
| 25.51 | G - Z | iP | 12h.10.99m | | | | | |
| | | i | 11.31 | | | | | |
| | | iS | 15.15 | | | | 24° | 0 (com- puted) 12h.5.7m |
| 25.90 | G - Z | iP | 21h 31.02m | | | | | comp. |
| | | e | 32.73 | | | | | |
| | | iS | 38.77 | | | | 55° | 0 (com- puted) 21h21.3?h |

*Date given in decimals of day.  #Arrival times given in decimals of minute.

Earthquakes without distinct epochs:
12.39*, 12.46, 15.35, 15.95, 18.76, 19.55, (time marks uncertain)
21.12, 23.95, 25.85, 26.49, 26.79, 27.21.

Lacunae, due to interrupted registration:
4.12 to 5.00, 6.42 to 6.45, 21.00 to 21.54, 24.00 to 24.54.

All readings given above from Galitizin Vertical. Constants: June 21, 1930
$T_1$ = .153m = 9.14 sec.  $Mu^2$ = .00
T = .168m = 10.05 sec.  Synchronous magnification = $kA_1T/4\pi l$ = 928

F. W. SOHON, S. J.
Director.

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# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka. 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | A | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date July 1930 | XXCHXXXXK INSTRUMENT | Phase | Time # | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | *Date given in decimals of day | | | | | | |
| | | | #Phase time given in decimals of minute. | | | | | | |
| 1.05* | G-Z | eP | 01h.16.86m | | | | | | dil. |
| | " | ePR1 | 18.4 | | | | | | |
| | " | i | 29.65 | | | | | 41.° | |
| | " | L | 31.0 | | | | | | |
| 2.89 | | 0 | 21h.03.53m | | | | | | |
| | G-Z | eP | 18.58 | | | | | | dil. |
| | " | eP' | 22.36 | | | | | | |
| | " | iPR | 23.38 | | | | | 114° | Phases after 21h.22m.also on N-S |
| | " | i | 33.22 | | | | | | |
| | " | L | 59.0 | | | | | | |
| 7.57 | G-Z | eP | 13h.38.42m | | | | | | |
| | G-N | e | 39.13 | | Evidences of two quakes with | | | | |
| | " | e | 41.69 | | 2d. P = 13.39.13 | | | | |
| | " | eS? | 43.88 | | 2d. S = 41.69 or 45.69 | | | | |
| | G-Z | e | 44.20 | | | | | | |
| | G-N | i | 45.69 | | | | | | |
| | G-Z | iL | 47.94 | | | | | | |
| | G-N | L | 50.5 | | | | | | |
| 13.05 | | 0 | 01h.04.83m | | | | | | |
| | G-N | eP | 9.50 | | N-S time doubtful to ± .05m. | | | | |
| | G-Z | P | 9.63 | | | comp. | | | |
| | G-N | i | 12.59 | | | | | | |
| | G-Z | iS | 13.12 | | | | | 20.2° | |
| | G-N | iS | 13.17 | | | | | | |
| | G-Z | L | 14.5 | | | | | | |
| 13.06 | G-Z | eP | 01h.35.9 m | | Overlapping previous quake | | | | |
| | G-N | iPR1 | 38.35 | | | | | | |
| | " | eS | 43.8 | | | | | 53°? | |
| | " | L | 53.0 | | | | | | |
| 14.95 | G-ZN | iP | 22h.46.37m. | | | comp. | | | |
| | G-ZN | iS | 51.60 | | | | | 32.8° | 0 = 22h.40.2m (U.S.C.G.S.) |
| | G-Z | L | 54.0 | | | | | | |
| 20.47 | G-ZN | eP | 11h.12.64m. | | | | | | |
| | G-N | i | 17.66 | | | | | | |
| | G-Z | i | 19.35 | | | | | | |
| | G-N | L? | 24.0 | | | | | | |
| | G-Z | L? | 27.3 | | | | | | |
| 22.82 | | 0 | 19h.26.03m. | | | comp. | | | |
| | G-Z | iP | 38.50 | | | | | | |
| | G-N | e | 48.68 | | | | | | |
| | " | iS | 49.00 | | | | | 83.8° | |
| | " | eL | 65.5 | | | | | | |

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No. 165b. From July 1 to July 31, 1930.

| DATE | INSTRUMENT | PHASE | TIME | PERIODS | AMPLITUDE $A_N$ | $A_E$ | A Z | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| July 1930 | | | | | | | | | |
| 23.01 | | 0 | 00h.09.0m | | | | | | Destructive, |
| | C-Z | (eP?) | 19.58 | | | | | | Province of Avel- |
| | G-N | eP | 19.62 | | | | | | lino, Italy |
| | G-N | eP | 19.69 | | | | | | |
| | G-Z | iP | 19.74 | | | | | | Dil. |
| | G-N | iS | 28.47 | | | | | 65.3° | |
| | G-E | eS | 28.50 | | | | | | |
| | G-NE | eL | 39.7 | | | | | | |
| 25.91 | | 0 | 21h.39.50m. | | | | | | |
| | G-E | eP | 46.18 | | | | | | |
| | G-EZ | e | 50.50 | | | | | | |
| | G-E | eS | 51.24 | | | | | 31.5° | |
| | G-E | L | 52.8 | | | | | | |
| 27.63 | G-Z | eP | 15h.07.34m | | | | | | |
| | G-N | iS | 11.95 | | | | | 27.6° | |
| | G-NZ | L | 16.0 | | | | | | |
| 27.80 | | 0 | 18h.58.19m. | | | | | | |
| | G-NZ | iP | 19h.04.58 | | | | | | |
| | G-N | eS | 09.44 | | | | | 29.7° | |
| | G-NEZ | L | 15.0 | | | | | | |
| 29.48 | | 0 | 06h.23.71m | | | | | | |
| | G-NEZ | iP | 29.88 | | | | | | |
| | G-NE | iS | 34.58 | | | | | 28.3° | |
| | " | L | 37.4 | | | | | | |

Earthquakes without distinct epochs, or with phases unidentified:
5.80, 5.92, 7.87, 9.66, 13.83, 14.87, 17.78, 19.65,
19.79, 20.55, 23.75, 27.36, 27.51, 29.89, 30.80.

Instruments

G-Z Vertical Galitizin
N-Z N-S " 
E-Z E-W "
Spindler&Hoyer Clock corrected daily by Arlington.

Constants:

| | Instrument | $T_1$ | T | $Mu^2$ | k | Synchronous Magnification |
|---|---|---|---|---|---|---|
| (Jun21/30) | G-Z | 9.14s<br>.153m | 10.05s<br>.169m | .00 | 288 | 928 |
| (Jul14/30) | G-N | 25.6s.<br>.427m | 26.03s<br>.434m | .07 | 81 | 1910 |
| " | G-E | 25.75s<br>.429m | 25.9s<br>.431m | -.1 | 93 | 2020 |

J. S. O'Conor, S. J.,
(Acting Director).

International Seismological Centre From the ISC collection scanned by SISMOS

No. 166

# W A S H I N G T O N, D. C.

## INSTRUMENTAL BULLETIN
of the Georgetown University Seismological Observatory.

| 1930 Aug. | Phase | N-S | E-W | Vert. | Remarks |
|---|---|---|---|---|---|
| | | Galitzin Readings of Quakes with Distinct Epochs | | | |
| 1.01 | ? | 7h e28.0m | i28.04m | | |
| | ? | e31.6 | | | |
| | eL | e37.7 | e32.3 | e37.8 | |
| 4.22 | O | 5h 4.4m computed from P and S | | | |
| | P | 5h i12.32 | e12.35 | i12.36 | dil from SW |
| | ? | i15.34 | e15.29 | i15.37 | very prominent |
| | ? | e16.99 | | e17.03 | prelude to S |
| | S | i18.54 | i18.54 | e18.5 | Distance 41°. Also others. |
| | $L_q$ | | e25.ca. | | no Raleigh waves |
| 18.42 | O | 9h 53.6m adopted from Coast Survey | | | |
| | e | 10h (Out of | e6.9 | e 7.7 | |
| | P | balance) | | i 7.83 | |
| | ? | | | e11.12 | |
| | ? | | | i11.86 | |
| | PR1 | | i12.17 | i12.15 | |
| | PR2 | | e14.3 | e14.4 | |
| | SKS | | i18.13 | | Also others. E-W faint; tangled. K written for $_cP_c$ |
| 29.36 | O | 8h 27.3m computed from P. S and PR1. | | | |
| | P | 8h i33.83 | | i33.84 | dil. from S |
| | PR1 | | | e34.75 | |
| | S | | e33.84 | | Distance 31° |
| | L | e42.ca | e40.ca | e42.ca | |

Earthquakes recorded without distinct epochs: 1.93, 2.71, 3.09, 3.94, 4.67, 5.02, 5.49, 6.26, 6.53, 10.01, 11.19, 13.06, 13.24, 19.09, 19.23, 19.28, 20.89, 21.85, 23.50, 24.42, 25.56, 25.90, 30.39, 31.04.

| Instrumental Constants. | N-S | E-W | Vertical |
|---|---|---|---|
| Galvonometer Period | 25.6 sec. | 25.7 sec. | 9.1 sec. |
| Pendulum Period | 26.0 | 25.9 | 10.0 |
| Damping: mu square | .07 | -.10 | .00 |
| Synchronous Magnification | 1767 | 2032 | 928 |
| Date | 1930 Jul.14 | Jul.18 | Jun.21 |

F. W. Sohon, S. J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

manque 166 167 168 169

No. 167 September 1930

WASHINGTON, D.C.
Instrumental Bulletin
of the Georgetown University Seismological Observatory

Galitzin Readings of Earthquakes with Distinct Epochs.
1930

| Sept | Phase | h | N-S | E-W | Vertical | |
|---|---|---|---|---|---|---|
| 2.67 | O | 15h 50.7m | | | | Computed from S-P |
| | P | 15h | e57.3 | e57.4 | e57.4 | |
| | S | | e62.3 | i62.42 | e62.8 | Distance 30.6° |
| | eL | | 66 ca | 64 ca | 67 ca | |
| 14.14 | | 3h | e21.0 | | i21.0* | *Obscured by clock |
| | | | e23.2 | | i23.11 | |
| | | | i27.05 | | i26.95 | |
| | | | i29.86 | | i30.18 | |
| | | | e30.5 ca | i30.86 | | |
| | | | i33.15 | | | |
| | | | e36.8 | i36.76 | | |
| | | | i38 10 | e39.7 | | |
| | | | i43.04 | i43.06 | e43.2 | |
| | eL | | 50 ca | 50 ca | 67 ca | |
| | W3? | | 232 | 232 | | listed below as 14.29 |
| 17.14 | O | 3h 24.6m | | | | Computed from S-P |
| | P | 3h | i27.91 | e27.9 | | |
| | S | | e30.5 | e30.5 | | Distance 13.4° |
| | eL | | 31.9 | 31 ca | 30 ca | |
| 22.08 | O | 1h 38.4m | | | | |
| | e | 1 | | | e50.18 | Prelude to P |
| | P | | i51.57 | e51.4 | e51.4 | |
| | PR1 | | | e55 ca | e55.4 | |
| | PR2 | | | e57.6 | | |
| | SKS | | | i61.49 | 61.68 | |
| | SR1 | | 68.09 | 68.12 | | Adopted distance 90° |
| | SR2 | | | 72.25 | | Also others |
| | eL | | 80 ca | 80 ca | 93 ca | |
| | W3 | | | 290 ca | 307 ca | |
| 30.90 | O | 21h 28.3m | | | | Adopted distance 90° |
| | e | | | | e40.0 | |
| | P | Horizontals not | | | i41.96 | |
| | PR1 | | | | e45.4 | |
| | SKS | | | | e51.9 | |
| | PS | | | | e53.5 | |
| | SR1 | | | | i58.35 | Also others |
| | eL | | | | 77 ca | |

Earthquakes recorded without distinct epochs (i.e. supplying only unidentifi-
e's): 1.23, 1.82, 1.86, 4.08, 4.45, 4.16, 7.57, 7.98, 11.08, 11.55, 12.05
12.07, 12.84, 12.93, 13.06, 13.17, 13.25, 13.33, 13.35 13.99, 14.29, 14.74
14.77, 15.05, 16.00, 16.47, 18.76, 20.10, 21.32, 21.41, 21.98, 22.23, 22.50
22.52, 22.59, 22.61, 22.73, 22.95, 23.18, 23.52, 23.59, 23.98, 24.36, 24.56
25.21, 25.50, 25.77, 26.19.

F.W.Sohon, S.J.

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$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = — .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory

No.168

Spindler & Hoyer Clock
corrected daily by NAA
G = Galitzin
(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

## Earthquakes with Distinct Epochs

| 1930 Oct | Instr Comp | Phase | Arrival Time h | m | Remarks |
|---|---|---|---|---|---|
| 8.44 | G-Z | eP | 10 | 34.4 | 0 10h 19.3m computed from |
| | Z | i | | 38.80 | PS-PR1 |
| | Z | iPR1 | | 39.23 | |
| | E | iSKS | | 44.97 | |
| | EZ | iPS | | 49.01 | Distance 138° |
| | E | iSR1 | | 55.41 | Also others. |
| | Z | eL | | 73 ca | |
| 11.18 | | 0 | 4 | 6.1 | Computed from S-P |
| | G -NZ | iP | | 15.74 | |
| | NEZ | S | | 21.5 | Clock mark. Distance 46° |
| | NE | SR1 | | 24.73 | |
| | | L | | | Unimportant |
| 17.37 | | 0 | 8 | 46.7 | Computed from S-P |
| | G-Z | iP | | 57.95 | |
| | E | iPR1 | | 60.95 | |
| | EZ | S | | 67.06 | Distance 69° |
| | | L | | | Irregular |
| 19.52 | G-Z | i | 12 | 22.31 | Horizontal records not legible |
| | | PcP? | | 22.51 | |
| 24.85 | G-Z | 0 | 20 | 14.8 | Computed from PR1-P |
| | | iP | | 29.62 | |
| | | iPR1 | | 34.18 | Distance 111° |
| | | PS | | 43.25 | Also others. Horizontal records |
| | | L | | 63 ca | not legible. |
| 25.51 | | 0 | 12 | 2.9 | Computed from S-P |
| | G-Z | P | | 12.23 | |
| | | PR1 | | 14.23 | |
| | | S | | 19.48 | Distance 52°. Also others. |
| | | L | | | Cut off |
| 28.89 | | 0 | 21 | 17.9 | Computed from S-P |
| | G-NEZ | iP | | 29.33 | |
| | NE | PR1 | | 32.50 | |
| | NEZ | S | | 38.75 | Distance 71°. Also others. |
| | | L | | | Large amplitudes, but legible. |
| 30.[illegible] | G-N | i | 7 | 32.34 | |
| .31 | E | i | | 32.44 | |
| | N | e | | 36.2 | |

## Earthquakes without Distinct Epochs.

1.16, 1.64, 3.07, 5.82, 6.21, 7.15, 7.35, 8.83, 9.23, 9.44, 9.90, 10.07
10.42, 12.13, 12.46, 13.12, 15.42, 15.86, 16.20, 16.61, 16.90, 17.08, 18.19
22.37, 22.41, 26.56, 27.21, 27.5, 28.99, 29.18, 29.56, 29.64, 30.24, 31.23
31.71, 31.81, 31.9

| Instrumental Constants | N-S | E-W | Z |
|---|---|---|---|
| Galvenometer Period | 25.6s | 25.7s | 9.1s |
| Pendulum Period | 26.0 | 25.9 | 10.0 |
| Damping mu square | .07 | -.10 | .00 |
| Synchronous Magnification | 1767 | 2032 | 928 |
| Date 1930 | Jul 14 | Jul 18 | Jun 21 |

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169, 170, - 172, 173 bis, - 174

$\phi = 38° 54' 25''$ N
$\lambda = 77° 4' 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock
corrected daily by NAA
G = Galitzin
(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k



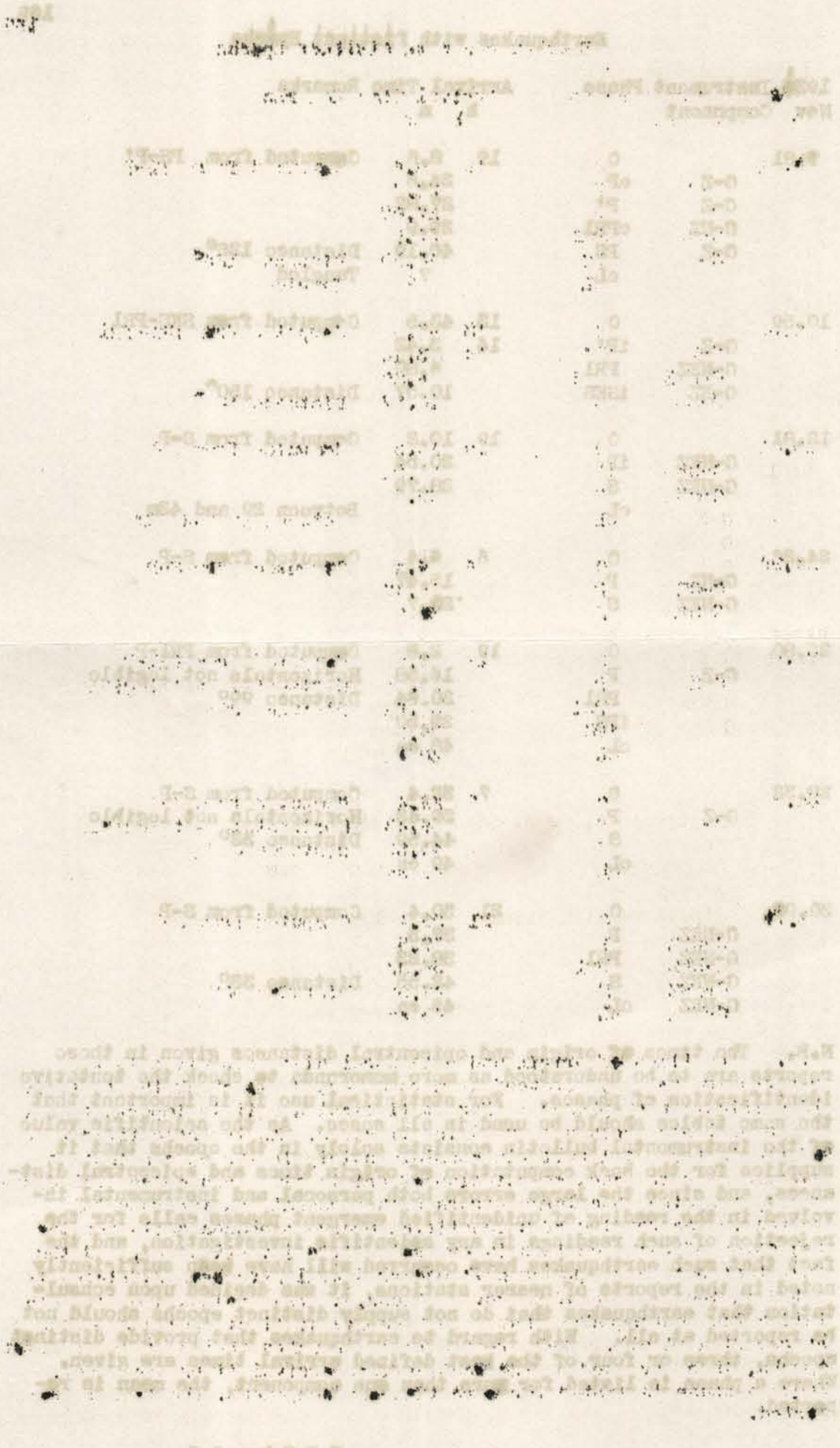
## Earthquakes with Distinct Epochs

| 1930 Nov | Instrument Component | Phase | Arrival Time h | m | Remarks |
|---|---|---|---|---|---|
| 9.81 | | 0 | 19 | 8.6 | Computed from PS-P' |
| | G-Z | eP | | 24.6 | |
| | G-Z | P' | | 27.82 | |
| | G-NZ | ePR1 | | 29.9 | |
| | G-Z | PS | | 40.19 | Distance 126° |
| | | eL | | ? | Tangled |
| 10.59 | | 0 | 13 | 43.5 | Computed from SKS-PR1 |
| | G-Z | iP' | 14 | 3.42 | |
| | G-NEZ | PR1 | | 6.80 | |
| | G-EZ | iSKS | | 10.57 | Distance 150° |
| 12.81 | | 0 | 19 | 10.2 | Computed from S-P |
| | G-NEZ | iP | | 20.54 | |
| | G-NEZ | S | | 28.79 | |
| | | eL | | | Between 29 and 42m |
| 24.26 | | 0 | 6 | 8.4 | Computed from S-P |
| | G-NZ | P | | 15.47 | |
| | G-NEZ | S | | 20.7 | |
| 25.80 | | 0 | 19 | 2.8 | Computed from PR1-P |
| | G-Z | P | | 16.58 | Horizontals not legible |
| | | PR1 | | 20.64 | Distance 99° |
| | | iPS | | 29.50 | |
| | | eL | | 48 ca | |
| 28.32 | | 0 | 7 | 32.4 | Computed from S-P |
| | G-Z | P | | 39.42 | Horizontals not legible |
| | | S | | 44.59 | Distance 32° |
| | | eL | | 49 ca | |
| 30.90 | | 0 | 21 | 30.4 | Computed from S-P |
| | G-NEZ | P | | 37.3 | |
| | G-NEZ | PR1 | | 38.23 | |
| | G-NEZ | S | | 42.55 | Distance 33° |
| | G-NEZ | eL | | 45 ca | |

N.B. The times of origin and epicentral distances given in these reports are to be understood as mere memoranda to check the tentative identification of phases. For statistical use it is important that the same tables should be used in all cases. As the scientific value of the instrumental bulletin consists solely in the epochs that it supplies for the back computation of origin times and epicentral distances, and since the large errors both personal and instrumental involved in the reading of unidentified emergent phases calls for the rejection of such readings in any scientific investigation, and the fact that such earthquakes have occurred will have been sufficiently noted in the reports of nearer stations, it was decided upon consultation that earthquakes that do not supply distinct epochs should not be reported at all. With regard to earthquakes that provide distinct epochs, three or four of the best defined arrival times are given. Where a phase is listed for more than one component, the mean is reported.

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International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock
corrected daily by NAA
G = Galitzin
(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

No. 170

| 1930 Dec | Instrument Component | Phase | Arrival Time h | m | Remarks |
|---|---|---|---|---|---|
| 3.80 | | 0 | 18 | 51.6 | Computed from SR1-PR1 |
| | G-Z | iPR1 | 19 | 12.22 | Horizontals not legible |
| | | iSKP | | 14.50 | |
| | | ePS | | 22.3 | |
| | | SR1 | | 29.13 | Distance 124° |
| | | eL | | 50 ca | |
| 6.30 | | 0 | 7 | 1.9 | Computed from S-P |
| | G-NZ | eP | | 13.8 | |
| | G-N | i | | 14.88 | |
| | G-Z | | | 23.16 | |
| | G-N | iS | | 23.58 | Distance 76° |
| | G-NZ | eL | | 33 ca | |
| 9.81 | | 0 | ? | | |
| | G-Z | ? | 19 | 25.58 | |
| | G-Z | i | | 30.54 | |
| | G-NEZ | i | | 32.51 | |
| | G-Z | i | | 34.54 | Also others. |
| | | L | inconspicuous. | | |
| 21.83 | | 0 | | ? | |
| | G-Z | i | 15 | 9.79 | |
| | Z | i | | 11.2 | Obscured by clock. |
| | G-NZ | - | | 21.7 | |
| | G-Z | - | | 23.12 | |
| | | L | | ? | |

| Instrumental Constants | | Wiechert | | Mainka | |
|---|---|---|---|---|---|
| Mass | | 200 | | 135 | |
| Component | | N-S | E-W | E-W | N-S |
| Period | | 4.8s | 5.3s | 11.8 | Not |
| Static Magnification | | 109 | 98 | 87 | in |
| Damping Ratio | | 4.7 | 5.5 | 3.9 | ad- |
| Friction | r | .12mm | .22mm | .58 | just- |
| | R | .005 | .008 | .004 | ment. |
| Date | | 1931 January 18. | | | |

The observations did not warrant a resolution of the friction into articular and tractive components.

| Constants of the Vertical Galitzin. | |
|---|---|
| Period of Galvonometer | 9.1 sec |
| Period of Pendulum | 9.6 sec |
| Mu Square | -.09 |
| Synchronous Magnification | 868 |
| Date | 1931 January 18. |

The 25kg Bosch-Omori is now in operation in Weston College, Weston, Mass., and the Bosch Photographic is being installed at Woodstock College, Woodstock, Md. Of the two Wiecherts, horizontal and vertical, each 80kg that were loaned to Guatemala, nothing has been heard since 1926, when they were said to be ready to start operation.

The horizontal Galitzins were transferred to the piers used for the Bosch Photographic, but their operation is far from satisfactory on account of the poor site.

F.W.Sohon,S.J.

International Seismological Centre From the ISC collection scanned by SISMOS

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = +.174
b = −.758
c = +.628

# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock
corrected daily by NAA
G = Galitzin
(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

No.171

| 1931 Jan | Instrument Component | Phase | Arrival Time h | m | Remarks |
|---|---|---|---|---|---|
| 2.41 | | 0 | 9 | 48.8 | Computed from S-P |
| | G-Z | P | 9 | 55.60 | |
| | | PR1 | | 56.50 | |
| | | S | | 60.8 | Distance 32° |
| | | L | | 67 | |
| 12.86 | | 0 | 20 | 34.6 | Computed from S-P |
| | G-NE | eP | | 44.7 | |
| | -NE | iS | | 54.95 | Distance 80° |
| | -NE | PS | | 55.85 | |
| | | eL | | 66 ca | |
| 15.08 | | 0 | 1 | 50.7 | Computed from S-P |
| | W-NE | iP | | 56.65 | G-Z reads the same |
| | -NE | S | | 61.32 | Distance 28° |
| | -NE | eL | | 64 ca | |
| 16.81 | | 0 | 19 | 19.2 | Computed from S-P |
| | G-Z | P | | 25.77 | |
| | W-NE | S | | 30.83 | Distance 31° |
| | W-NE | eL | | 35 ca | |
| 17.12 | | 0 | 2 | 50.0 | Computed from S-P |
| | G-Z | P | | 56.56 | |
| | -Z | eS | | 61.6 | Distance 30° |
| | -Z | i | | 62.26 | |
| | M,W | eL | | 66 ca | |
| 23.25 | | 0 | 5 | 52.3 | Computed from S-P |
| | W-E | iP | | 58.31 | |
| | W-N | S | | 62.6 | Distance 26° |
| | G-Z | eL | | 68 ca | |
| 25.53 | | 0 | 12 | 34.3 | Computed from S-P |
| | G-Z | iP | | 41.18 | |
| | G-NEZ | PR1 | | 42.00 | |
| | -NEZ | eS | | 46.2 | Distance 32° |
| | -NEZ | eL | | 50 ca | |
| 27.85 | | 0 | 20 | 9.1 | Computed from SR1-PR1 |
| | G-NZ | PR1 | | 28.92 | |
| | -NE | SKS | | 34.82 | |
| | -NEZ | PS | | 38.5 | |
| | -NZ | SR1 | | 45.00 | Distance 116° |
| | -Z | eL | | 63 | |
| 28.90 | | 0 | 21 | 24.0 | Computed from PS-SKS |
| | G-NEZ | PR1 | | 44.1 | |
| | -NEZ | iSKS | | 49.89 | |
| | -NEZ | iPS | | 54.07 | Distance 116° |
| | -Z | eL | | 75 ca | |
| 29.72 | | 0 | 17 | 10.6 | Computed from S-P |
| | G-NEZ | P | | 16.45 | |
| | -NEZ | eS | | 20.9 | Distance 26° |
| | -NEZ | eL | | 24.5 | |

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International Seismological Centre From the ISC collection scanned by SISMOS

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$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory No.172

Spindler & Hoyer Clock
corrected daily by NAA
G = Galitzin
(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

| 1931 Feb | Instrument Component | Phase | Arrival Time h | m | |
|---|---|---|---|---|---|
| 2.96 | | 0 | 22h | 47.0 | Computed from PS-PR1 |
| | G-NE | P' | 23 | 5.89 | G-Z: iP' 5.80 |
| | -NE | iPR1 | | 7.54 | G-Z: i7.59, i7.65 |
| | -E | iPS | | 17.59 | Dist 121°; G-Z:17.45 |
| | Record changed during quake | | | | |
| 7.15 | | 0 | 3 | 29.9 | Computed from S-P |
| | G-NZ | iP | | 36.38 | Com. from S |
| | -NEZ | PR1 | | 37.23 | |
| | -NZ | S | | 41.30 | Dist. 29.8° |
| | | eL | | 45 ca | |
| 8.09 | | 0 | 1 | 44.6 | Computed from PS-PR1 |
| | G-Z | P' | 2 | 2.79 | |
| | -EZ | PR1 | | 4.80 | |
| | -E | PS | | 14.74 | Distance 118° |
| | -Z | eL | | 47 | |
| 9.10 | | 0 | 2 | 11.0 | Computed from S-P |
| | G-N | P | | 20.41 | |
| | -NE | S | | 27.73 | Distance 52° |
| | -NE | eL | | 35 ca | |
| 10.25 | G-NEZ | iP' | 6 | 54.20 | |
| | -NZ | PR1 | | 57.57 | Many contradictory impulses |
| 12.25 | | 0 | 5 | 43.9 | Computed from SR1-P' |
| | G-NZ | iP' | 6 | 3.70 | Com from S |
| | -Z | PR1 | | 6.82 | |
| | -E | SR1 | | 25.42 | Distance 143° |
| | -Z | eL | | 66 | |
| 12.34 | | 0 | 8 | 6.7 | Computed from S-P |
| | G-NEZ | P | | 12.36 | |
| | -NEZ | S | | 16.77 | Distance 25.3° |
| | -NE | eL | | 19.3 | |
| 13.07 | | 0 | 1 | 27.3 | Computed from PS-PR1 |
| | G-Z | P' | | 46.29 | |
| | -E | PR1 | | 47.99 | |
| | -EZ | PS | | 58.28 | Distance 124° |
| | -Z | eL | | 85 ca | |
| 14.60 | | 0 | 13 | 58.7 | Computed from PS-P' |
| | G-Z | P' | 14 | 18.48 | |
| | -Z | ePS | | 33.3 | Distance 143° |
| | -Z | eL | | 72 ca | |
| 16.79 | | 0 | 18 | 48.3 | Computed from PS-P |
| | G- Z | iP | 19 | 1.73 | |
| | -N | SKS | | 12.30 | |
| | -N | PS | | 13.91 | Distance 93° |
| | | eL | | 33 | |
| 19.75 | | 0 | 17 | 47.5 | Computed from PR1-P |
| | G -NEZ | iP | 18 | 0.16 | Com from NE |
| | -Nz | iPR1 | | 3.63 | |
| | -NEZ | eS | | 10.4 | |
| | -NZ | eL | | 26 | Overlapping the following |
| 19.78 | G-Z | i | 18 | 43.90 | |
| | -Z | i | | 47.40 | |
| | -Z | eL | | 61 ca | |

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
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$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

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Spindler & Hoyer Clock
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G = Galitzin
(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

172 bis

| 1931 Feb | Instrument Component | Phase | Arrival Time h | m | |
|---|---|---|---|---|---|
| 20.24 | G-Z | i | 5 | 45.94 | |
| | -NZ | i | | 47.29 | |
| | -N | i | | 48.18 | |
| | -NE | i | | 55.88 | |
| | -N | i | | 57.51 | Also many others |
| 27.41 | | 0 | 9 | 41.3 | Computed from PS-PR1 |
| | G-Z | i | | 56.99 | |
| | -N | i | | 59.38 | |
| | -NE | iPR1 | | 60.42 | |
| | -E | PS | | 69.63 | Distance 109° |
| | -NE | eL | | 92 ca | |

Instrumental Constants:

| Component | G-N | G-E | G-Z |
|---|---|---|---|
| Period of Galvonometer | 25.6s | 25.7s | 9.1s |
| Period of Pendulum | 26.0 | 25.9 | 9.6 |
| Mu Square | .07 | -.10 | -.09 |
| Synchronous Magnification | 1767 | 2032 | 868 |
| Date of Test | 1930 Jul 14. | 1930 Jul 18. | 1931 Jan 18. |

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$\phi = 38°\ 54'\ 25''$ N
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$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
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Spindler & Hoyer Clock
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(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

No.173

| 1931 Mar | Instrument Component | Phase | Arrival Time h | m | |
|---|---|---|---|---|---|
| 2.11 | | 0 | 2 | 18.3 | Computed from PS-PR1 |
| | G-E | PR1 | | 38.61 | |
| | -EZ | SKS | | 43.9 | |
| | -EZ | PS | | 48.55 | Distance 120° |
| | -Z | eL | | 75 | |
| 7.03 | | 0 | 0 | 41.4 | Computed from S-P |
| | G-NZ | P | | 47.88 | |
| | -N | PR1 | | 48.81 | |
| | -NZ | S | | 52.85 | Distance 30° |
| | -Z | eL | | 57 | |
| 8.12 | | 0 | 1 | 50.5 | Computed from S-P |
| | G-NZ | P | 2 | 1.76 | |
| | -N | S | | 11.07 | Distance 70° |
| | -NZ | eL | | 22 ca | |
| 9.17 | | 0 | 3 | 49.7 | Computed from S-P |
| | G-N | P | 4 | 2.26 | G-Z:i2.46 |
| | -Z | PR1 | | 5.86 | |
| | -N | S | | 12.73 | Distance 83° |
| | -Z | eL | | 30 | |
| 11.54 | | 0 | 12 | 26.6 | Computed from PS-SKS |
| | G-Z | PR1 | | 45.46 | |
| | -NE | SKS | | 51.66 | |
| | -N | PS | | 54.74 | Distance 107° |
| 18.34 | | 0 | 8 | 2.3 | Computed from S-P |
| | G-NEZ | P | | 13.76 | |
| | -NE | S | | 23.17 | Distance 72°, G-Z:i23.25 |
| 18.86 | | 0 | 20 | 13.6 | Computed from PS-P' |
| | G-Z | iP' | | 32.82D | |
| | | iPR1 | | 35.49 | Late for PR1 |
| | | i | | 36.09 | Largest amplitude |
| | | iSKP | | 36.69 | Very large |
| | | SKS | | 39.77 | |
| | | PS | | 46.52 | Distance 130° |
| | | eL | | 75 | |
| 19.28 | | 0 | 6 | 25.3 | Computed from PS-PR1 |
| | G-Z | P' | | 44.19 | |
| | -NZ | PR1 | | 45.42 | |
| | -NE | SKS | | 50.89 | PS-SKS gives 119°, 25.0m |
| | -NEZ | PS | | 55.21 | Distance 117° |
| | -Z | eL | | 87 | |
| 28.54 | G-NZ | P' | 12 | 57.90 | |
| | -N | PR1 | | 61.89 | G-Z:i61.29. Many inconsistent |
| | -N | SKS | | 67.87 | impulses on G-Z |
| | -N | PS | | 73.34 | |
| | -N | SR1 | | 79.8 | |
| 31.67 | | 0 | 16 | 1.6 | Computed from S-P |
| | G-Z | eP | | 8.0 | |
| | -E | iS | | 12.83 | |
| | -EZ | eL | | 16 | |

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$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
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M = Mainka 135k

1931 April — No.174

| | | | h | m | |
|---|---|---|---|---|---|
| 3.09 | | 0 | 1 | 55.6 | From S-P |
| | G-Z | P | 2 | 4.92 | Com |
| | -Z | PR1 | | 7.12 | |
| | -EZ | S | | 11.99 | Distance 50° |
| | -Z | eL | | 19 | |
| 6.30 | | 0 | 6 | 49.8 | From PS-PR1 |
| | G-Z | iP' | 7 | 8.60 | Com |
| | -EZ | PR1 | | 10.22 | |
| | -NZ | PS | | 20.17 | |
| | | eL | | 45 ca | |
| 9.97 | | 0 | 23 | 1.4 | From S-P |
| | G-Z | iP | | 14.10 | Com |
| | -NZ | eS | | 24.7 | Distance 85° |
| | -Z | eL | | 47 ca | G-N: 35ca |
| | -N | M | | 50 | |
| 12.10 | | 0 | 2 | 18.3 | From S-P |
| | G-N | P | | 29.37 | |
| | -NE | S | | 37.97 | Distance 65° |
| | -N | SR1 | | 41.3 | |
| | -NE | eL | | 50 | G-Z: 58 |
| 15.71 | | 0 | 16 | 58.6 | From S-P |
| | G-NEZ | P | 17 | 6.09 | |
| | -NEZ | i | | 7.41 | |
| | -NE | S | | 11.72 | Distance 36° |
| | -NEZ | eL | | 15 | |
| 19.05 | | 0 | 2 | 0.0 | From S-P |
| | G-EZ | P | | 7.08 | |
| | -EZ | iS | | 12.44 | Distance 34° |
| | -E | SR1 | | 14.41 | |
| | -Z | eL | | 18 | |
| 20.83 | G-N | e | 19 | 55.56 | New York State |
| | -NEZ | i | | 57.21 | |
| | -Z | i | | 57.31 | |
| | -Z | | | 57.40 | |
| | -Z | | | 57.64 | |
| 24.74 | | 0 | 17 | 22.0 | From PR1-P' |
| | G-Z | P' | | 41.24 | Com |
| | -Z | PR1 | | 42.84 | Distance 124° |
| | -Z | PS | | 52.64 | From PS-PR1:Or. 22.9,Dist.116° |
| | -Z | eL | | 66 ca | |
| 27.71 | | 0 | 16 | 50.6 | From S - P |
| | G-Z | iP | 17 | 3.42 | Dil |
| | -Z | PR1 | | 6.87 | |
| | -N | iSKS | | 13.77 | |
| | -NZ | iS | | 14.12 | Dist 86° |
| | -NZ | eL | | 28.5 | |

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$\phi = 38°\ 54'\ 25''$ N
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$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
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W = Wiechert 200k
M = Mainka 135k

1931 No.175

| May | | | h | m | |
|---|---|---|---|---|---|
| 1.95 | G-Z | P | 22 | 43.27 | |
| 9.15 | | 0 | 10 | 34.5 | From S-P |
| | G-EZ | eP | | 41.0 | |
| | -EZ | eS | | 46.1 | Distance 30° |
| | -E | eL | | 49 | |
| 10.82 | | 0 | 19 | 26.1 | From PR1-P |
| | G-NZ | eP | | 36.7 | |
| | -Z | ePR1 | | 39.5 | Distance 64° |
| | -Z | eS | | 45.2 | |
| | -NEZ | eL | | 60 ca | |
| 12.04 | | 0 | 1 | 37.4 | From S-P |
| | G-NZ | iP | | 49.23 | Dil. from N |
| | G-NEZ | S | | 58.71 | Distance 73° |
| | -NE | eL | | 68 ca | |
| 16.87 | | 0 | 20 | 47.2 | From S-P |
| | G-NEZ | iP | | 53.53 | Dil from SW |
| | -NE | iS | | 58.36 | Distance 29° |
| | -NEZ | eL | | 61 | |
| 20.11 | | 0 | 2 | 22.7 | From S-P |
| | G-NEZ | iP | | 31.44 | Dil from NE; many unidentified |
| | -NEZ | iPR1 | | 33.36 | impulses, suggesting more than |
| | -NEZ | iS | | 38.30 | one shock. Distance 47° |
| | -Z | eL | | 45 | |
| 20.92 | | 0 | 21 | 53.7 | From S-P |
| | G-NZ | iP | 22 | 4.82 | Com |
| | -NZ | S | | 13.82 | Distance 67° |
| | -Z | eL | | 26 | |
| 23.15 | | 0 | 3 | 26.7 | From S-P |
| | G-NEZ | P | | 31.97 | |
| | -NE | S | | 35.98 | Distance 23° |
| | -Z | eL | | 38 | |
| 27.26 | G-E | i | 6 | 20.96 | |
| | -NE | eL | | 28 | Overlapping the following |
| 27.28 | G-Z | i | 6 | 45.88 | |
| | -Z | eL | | 64 | |
| 27.44 | | 0 | 10 | 20.1 | From S-P |
| | G-NZ | eP | | 28.15 | |
| | -NEZ | S | | 34.20 | Distance 41° |
| | -NZ | eL | | 40 | |
| 28.14 | | 0 | 3 | 14.7 | From S-P |
| | G-NZ | eP | | 24.86 | |
| | -ne | S | | 32.99 | Distance 59° |
| | -E | eL | | 40 | |
| 29.23 | | 0 | 5 | 15.8 | From S-P |
| | G-NZ | P | | 25.28 | |
| | -NE | S | | 32.78 | Distance 53° |
| | -NE | eL | | 38 | |
| 30.50 | | 0 | 11 | 48.5 | From S-P |
| | G-NE | iP | | 54.65 | IDENTIFICATION |
| | -NE | eS | | 59.2 | Distance 28° POOR |
| | -NE | eL | | 69 | |

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M = Mainka 135k

1931
Month of June.

No.176

| | | | h | m | |
|---|---|---|---|---|---|
| 9.59 | G-Z | PR1 | 14 | 10.00 | |
| | G-E | iPS | | 17.23 | |
| | G-NEZ | eL | | 41.0 | |
| | G-EZ | M | | 45.0 | Overlapping another of less intensity. |
| 13.65 | | | | | |
| | G-Z | PR1 | 15. | 53.24 | From PS-PR1 |
| | -NEZ | PS | | 62.70 | Distance 111° |
| | -E | SR1 | | 68.5 | |
| | -Z | eL | | 90. | |
| | -EZ | M | | 95.5 | |
| 15.47 | | 0 | 11 | 19.5 | |
| | G-EZ | P | | 29.35 | From S-P |
| | -E | S | | 34.00 | Distance 55° |
| | -Z | eL | | 46.0 | |
| 20.05 | | | | | |
| | | 0 | 1 | 16.5 | |
| | G-NZ | P | | 28.03 | From S-P |
| | -NE | eS | | 37.55 | Distance 73° |
| | NE | SR1 | | 42,5 | |
| | | eL | | 50. | |
| 20.63 | | | | | |
| | | 0 | | 15.07.2 | |
| | G-NZ | iP | | 14.75 | From S-P |
| | -EZ | iS | | 22.42 | Distance 55° |
| | -E | eL | | 27. | |
| 21.52 | | | | | |
| | | 0 | 12. | 22.3 | |
| | G-NZ | iP | | 29.80 | From S-P |
| | -EN | PR1 | | 30.67 | |
| | " | eS | | 35.12 | Distance 32° |
| | " | eL | | 36.8 | |
| | " | M | | 41.5 | |
| 23.27 | | | | | |
| | G-EZ | PR1 | 6 | 32.42 | From S-PR1 |
| | -NE | iSKS | | [illegible].08 | |
| | " | S | | 39.82 | (Distance 90°) |
| | -N | PS | | 40.20 | |
| | " | eL | | 56. | |
| 29.85 | | | | | |
| | | 0 | 20 | 24.13 | |
| | G-NZ | iP | | 35.22 | From S-P |
| | G-NE | iS | | 44.28 | Distance 68° |
| | -N | eL | | 61. | |

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h = 42.4 m
Sub-Soil, Decayed Diorite
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G = Galitzin
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W = Wiechert 200k
M = Mainka 135k

No.177

1931
July

| | | | h | m | |
|---|---|---|---|---|---|
| 11.25 | | 0 | 5 | 55.9 | |
| | G-ZN | iP | 6 | 04.66 | From(S?-P)$_o$ |
| | -N | S(?) | | 11.40 | Distance47$^o$(?) |
| | " | L | | 16.00 | |
| | | M | | 22.8 | |
| 15.69 | G-Z | eP | 16. | 38.75 | From S?-P |
| | -E | eS? | | [illegible]7 | Distance 73$^o$(?) |
| | " | eL | | 59.0 | |
| | " | M | | 66.7 | |
| 17.38 | | | | | |
| | | 0 | 9 | 13.40 | |
| | G-NZ | P | | 19.72 | From S-P |
| | EN | S | | 24.54 | Distance 29$^o$ |
| | E | L | | 28.1 | |
| | N | M | | 29.6 | |
| 18.23 | | 0 | 5 | 27.0 | |
| | G-NZ | P | | 37.21 | Dil. From N |
| | -NE | iS | | 45.43 | Distance 60$^o$ (S-P) |
| 18.48 | | | | | |
| | | 0 | 11 | 23.64 | |
| | G-NEZ | iP | | 35.44 | Comp. From NW |
| | -Z | eS | | 44.94 | Distance 75$^o$ (S-P) |
| | ZN | L | | 58. | Records on horizontal components |
| | Z | eM | | 66. | changed during progress of quake |
| 21.15 | | | | | |
| | | 0 | 3 | 36.1 | |
| | G-Z | iP' | | 54.95 | |
| | -EZ | PR1 | | 56.42 | Distance 121$^o$(PR1-P')(?) |
| | N | i | | 64.23 | |
| | " | i | | 72.8 | |
| | "" | ii | | 73.85 | |
| | " | L | | 86.8 | |
| 23.60 | | 0 | 14 | 20.2 | |
| | G-Z | P'(?) | | 39.27 | |
| | " | ePR1(?) | | 41.01 | Distance 125$^o$(?) (PR1-P') |
| | -EZ | i | | 42.22 | Horizontals obscured by wind effects |
| | E | SKS | | 45.68 | |
| | " | M | | 93. | |
| 27.30 | | | | | |
| | | 0 | 7 | 15.83 | |
| | G-NEZ | iP | | 21.33 | Dil. From NE |
| | " | iS | | 25.54 | Distance 24.2$^o$ (S-P) |
| | NE | L | | 28;1 | |
| 27.69 | | | | | |
| | | 0 | 16 | 28.58 | |
| | G-NZ | P | | 36.46 | |
| | NEZ | eS | | 42.55 | |
| | E | L | | 47.4 | |

J.S.O'Conor, S.J.
(Acting Director)

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = — .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock
corrected daily by NAA
G = Galitzin
(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

1931 No.178
August

| | | | h | m | |
|---|---|---|---|---|---|
| 7.69 | | 0 | 2 | 11.5 | |
| | G-Z | eP' | | 30.76 | |
| | G-Z | iP' | | 30.84 | |
| | G-Z | ePR1 | | 30.93 | Distance 131° |
| | G-ZN | iSKP | | 34.52 | |
| | G-ZN | L | | 78.9 | |
| 10.89 | | 0 | 21 | 18.45 | |
| | G-Z | P | | 32.00(?) | First motion obscured by time mark |
| | G-N | iP | | 32.20 | |
| | G-N | SKS | | 42.48 | |
| | G-N | | | 43.17 | |
| | G-Z | PS | | 45.16 | Distance 95° |
| | W-NE | | | 67.3 | |
| 13.93 | | | | | |
| | G-Z | P | 22 | 29.16 | |
| | G-Z | PS | | 39.02 | |
| | G-NE | M | | 60.5 | |
| 16.49 | | 0 | 11 | 40.20 | Preceeded by shock: iP; 11,26.62 |
| | G-Z | iP | | 45.65 | |
| | G-N | iS | | 49.86 | Distance 23.8° |
| | W-NE | L | | 52.9 | |
| | | | | | F overlapping with another iP at 13h 45.90m |
| 18.60 | | 0 | 14 | 20.88 | |
| | GZN | P | | 34.34 | |
| | G-N | iSKS | | 44.84 | Distance 94° |
| | G-Z | ePS | | 46.54 | |
| | G-Z | L | | 66.06 | |
| | G-Z | M | | 72.2 | |
| 24.90 | | 0 | 21 | 35.20 | |
| | G-ZN | eP | | 49.55 | |
| | G-N | iSKS | | 60.05 | Distance 105° |
| | G-N | PS | | 62.9 | |
| | G-N | L | | 86.9 | |
| | G-N | M | | 98.3 | |
| 27.66 | | 0 | 15 | 27.0 | |
| | G-Z | eP | | 41.40 | |
| | G-Z | PR1 | | 45.68 | |
| | G-Z | PS | | 54.83 | Distance 105° |
| | G-Z | M | | 85. | |

J.S.O'Conor, S.J.

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$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock
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(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

1931 No.179

| September | | | h | m | |
|---|---|---|---|---|---|
| 6.34 | | 0 | 8 | 02.2 | |
| | G-Z | eP | | 08.9 | |
| | G-E | iS | | 14.23 | Distance 32° |
| | G-E | L | | 15.23 | |
| | G-Z | M | | 18.3 | |
| 9.57 | | 0 | 13 | 40.3 | |
| | G-Z | eP | | 47.8 | |
| | " | ePRl | | 49.0 | |
| | " | S | | 53.5 | Distance 37° |
| | " | M | | 61. | |
| 9.86 | | 0 | 20 | 37.9 | |
| | G-Z | eP | | 52.60 | |
| | " | eP' | | 56.44 | |
| | " | iPS | | 66.40 | Distance 109° |
| | " | L | | 91. | |
| | " | M | | 99. | |
| 20.96 | | 0 | 23 | 04.9 | |
| | G-E | Pg | | 06.81 | |
| | G-EZ | Sg | | 07.97 | Distance 5.3° |
| | G-Z | M | | 08.55 | |
| 21.10 | | 0 | 2 | 19.8 | |
| | G-Z | SKS | | 44.30 | |
| | " | SKKS | | 45.1 | |
| | " | SRl | | 52. | Distance 99°(Measured) |
| | " | M | | 71.9 | |
| | " | | | | |
| 25.25 | | 0 | 5 | 59.6 | |
| | G-ZN | iP' | 6 | 19.52 | Compression. |
| | G-E | iPRl | | 22.85 | |
| | G-Z | SKP | | 23.35 | |
| | G-E | SKS | | 26.60 | Distance 149°(Measured) |
| | G-Z | M | | 81.6 | |
| 26.83 | | | | | |
| | G-Z | i | 20 | 01.90 | Identification poor because of |
| | " | (I) iPRl | | 06.7 | heavy micros. Undetermined loosing |
| | " | i | | 08.85 | rate on G-Z clock. |
| | " | (I) L | | 14.65 | JSA and USCG identify as two shocks. |
| | " | (II) M | | 21.6 | |

Exceptional microseismic activity, beginning Sept19,05hrs
Continuing till Sept.23 with gradually diminishing intensity
Increasing again on Sept.25,14hrs. Maximum activity on Sept.
27, and 28. Continuing through end of month.
Maximum trace range 4.5mm.
Avg. period 6 sec.

J.S.O'Conor, S.J.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock
corrected daily by NAA
G = Galitzin
(Cambridge & Paul)
W = Wiechert 200k
M = Mainka 135k

1931 No.180
October

| | | | h | m | |
|---|---|---|---|---|---|
| 3.80 | | 0 | 19 | 13. | |
| | G-NE | eP | | 29.2 | |
| | G-N | iP'? | | 33.2 | |
| | G-E | iPR1 ? | | 34. | |
| | G-N | SKP | | 42. | Distance 121° (Ca) |
| | W-E | L | | 63.45 | |
| | W-E | M | | 70.4 | |
| 10.01 | | 0 | 00 | 19.8 | |
| | G-Z | eP | | 35.29 | |
| | " | P' | | 38.82 | |
| | " | PR1 | | 40.24 | |
| | " | PS | | 50.36 | Distance 119° (From PS - P') |
| | " | L | | 81. | |
| 26.18 | | 0 | 04 | 24.6 | |
| | G-Z | P? | | 31.46 | |
| | " | L | | 41.39 | Distance 32.1°(Measured) |
| | " | M | | 44.47 | |

November

| | | | | | |
|---|---|---|---|---|---|
| 2.02 | | 0 | 00 | 31.8 | |
| | G-Z | iP | | 38.03 | |
| | " | iL | | 47.20 | Distance 30° (measured) |
| | " | M | | 50.8 | |
| 2.42 | | 0 | 10 | 03.02 | |
| | G-Z | eP | | 17.12 | |
| | " | iPR1 | | 21.44 | Distance 104° (PR1-P) |
| | " | M | | 66.7 | |
| 20.60 | | 0 | 14 | 16.8 | |
| | G-Z | ePR1 | | 36.81 | |
| | " | ePS | | 46.95 | Distance 121° (PS-PR1) |
| | " | L | | 78. | |

Summary of Galitzin Constants: From Jan.1931 to Aug.31, 1931

| Component | N-S | E-W | Z |
|---|---|---|---|
| Gal period $T_1$ | 25.6sec | 25.7 sec | 9.1sec. |
| Pend. " T | 26.0 | 25.9 | 9.6 |
| Mu square | +.07 | -.10 | -.09 |
| Synchronous Magnification $\frac{KA_1T}{4\pi l}$ | = 1767 | 2032 | 868 |

Summary of Galitzin Constants From Aug.31, 1931 to October 15, 1931
The above values are correct except for a change in $A_1$ on North and East Component making the

| Synchronous Magnification = | N-S | E-W | Z |
|---|---|---|---|
| | 1593. | 1849. | 868 |

(J.U.O'C.S.J.)

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
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h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = — .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
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M = Mainka 135k

1931
December

No.181

| | | | h | m | |
|---|---|---|---|---|---|
| 17.15 | | | | | |
| | G-NEZ | Pg | 03, | 41.19 | Amplitudes less than micros, |
| | G-Z | P* | | 41.38 | distinguishable by shorter period. Press time of 0 = 03h. 38m. Felt in Tennessee. |
| 24.16 | G-NEZ | i | 03 | 49.54 | (possibly micro) |
| | " | iP | | 49.90 | |
| | G-ZE | eS? | | 57.4 | |
| | G-ZE | eSR1 | | 60.8 | |
| | G-E | eL | | 67.5 | Surface waves small and irregular |

1932
January

| | | | | | |
|---|---|---|---|---|---|
| 5.08 | | 0 | 01 | 54.0 | |
| | G-Z | iP | 02 | 05.60 | |
| | G-N | iS | | 15.15 | Distance 73° (From S-P) |
| | " | SR1 | | 20.0 | |
| | GM | M | | 34.0 | |
| 9.43 | | 0 | 10 | 19.+(ca) | |
| | G-Z | eP' | | 38.1 | |
| | " | iPR1 | | 46.00 | N.B. Record reread and interpreted |
| | " | iSKP | | 41.70 | in view of note of JSA on probability |
| | G-E | ePR2 | | 43.0 | of deep focus. |
| | " | eSKKS | | 46.4 | Distance 128° ca. |
| | " | eSPS | | 58.0 | No usual surface waves; continuation of motion of irregular period. |
| 24.16 | | 0 | 03 | 43.8 | |
| | G-Z | ePR1 | 04 | 04.5 | |
| | G-E | ePS | | 14.4 | Distance 120° (Measured) |
| | " | SPS | | 21.4 | |
| | " | L | | 42.0 | |
| 29.57 | | C | 13 | 40.9 | |
| | G-Z | eP' | 14 | 00.1 | |
| | G-EZ | ePR1 | | 01.8 | |
| | G-E | ePS | | 12.0 | Distance 123° (From PS-PR1) |
| | " | i | | 19.4 | |
| | " | eSR2 | | 31.1 | Note: Periods of PS and SR2 = .7m and .75m |
| | G-E | L | | 38.9 | |
| | W | L | | 41.0 | |
| | G-E | M | | 49.0 | |
| | W | M | | 51.0 | |
| AFTERSHOCK with: | | | | | |
| | G-NEZ | L | 16. | 40.0 | |
| | " | M | | 52.0 | |

J.S.O'C., S.J.

International Seismological Centre From the ISC collection scanned by SISMOS

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h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1932
February

No. 182

| | | | h | m | |
|---|---|---|---|---|---|
| 3.2' 6 | | 0 | 16 | 15.8 | |
| | G-NZ | iP | | 20.38 | Comp. |
| | G-NE | iS | | 23.92 | Distance 18.7° (S-P) |
| | G-ZN | M | | 27.5 | |
| 16.58 | | | | | |
| | G-Z | SR1(?) | 14 | 23.6 | |
| | G"E | L | | 39.7 | |
| | " | M | | 43.5 | Amplitude ratio of ME to $M_N$ 3 : 1 |
| 17.67 | | 0 | 16 | 07.00 | |
| | G-ZN | iP | | 12.70 | |
| | G-NE | S | | 17.4 | Distance 26° (S-P) |
| | G-E | L | | 22.1 | |
| 23.00 | | | | | |
| | G-Z | (iSKP) | 00 | 03.18 | Identification of phases tentative, |
| | G-N | (iPPS) | | 12.76 | based on similarity of characteristics |
| | G-E | " | | 12.85 | to quake of Jan, 29.57 |
| | G-NE | (iPPS?) | | 19.02 | T=0.6?m Amplitude 550microns. |
| | G-N | (iSR2) | | 23.08 | |
| | G-N | eL | | 38. | |

Note on earthquake of Jan.9.43, 1932.
Following the adoption of a focal depth of 0.06 and time of O= 10h21.8m it is interesting to observe that the arrival times listed in the previous bulletin(omitting the first reading,10,38.1 as micro) can all be interpreted to agree with the phases of the Scrase table, with distance from Washington taken as 118°. Viz:

| | | | |
|---|---|---|---|
| Jan. | | | |
| 9.43 | 0 | 10h | 21.8 |
| | iP' | | 40.00 |
| | iPR1 | | 41.70 |
| | opPR1 | | 43.0 |
| | SKS | | 46.4 |

J.S.O'C., S.J.

International Seismological Centre From the ISC collection scanned by SISMOS



Note jointe au bulletin de l'Observatoire de Georgetown :

Plusieurs rectifications ont été apportées au bulletin ....

.....

Le temps d'arrivée des phases "i" sera indiqué au 1/100 de minute; celui des phases "e" au 1/10 de minute.

Le système décimal a été adopté non-seulement dans le fait de la substitution des centièmes de minutes aux secondes, mais aussi dans la numérotation [identification number] des tremblements de terre eux-mêmes.

Chaque tremblement est numéroté d'après le chiffre de la date (le quantième du mois), et aussi par le nombre de centièmes de jour qui s'étaient écoulés au moment où le tremblement a pris naissance. (Lorsque le temps origine est inconnu, on y substitue le temps d'arrivée du premier mouvement.)

Lorsqu'au cours d'un tremblement de terre une nouvelle secousse

International Seismological Centre From the ISC collection scanned by SISMOS

... minutes de l'heure —
... prises, ainsi : 60, 70, 80 etc.
....

Les amplitudes et directions réelles ne seront données que lorsque la détermination de l'azimut peut être faite au moyen des P.

La distance épicentrale de ... sera donnée en degrés des grands arcs de cercle ; 9° = 1000 km.

La notation K a été substituée à cPc du nouveau code international.

.....

Des modifications ont été apportées au mécanisme d'inscription du galitzine vertical, ainsi qu'au remplacement et aux périodes du galitzine horizontal ; ci-dessous les constantes.

[Prière de se reporter pour ces constantes au texte anglais. N.D.T.]

Une table pour la conversion des centièmes de minute en secondes sera jointe, sur demande, au prochain bulletin.

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International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

**of the Georgetown University Seismological Observatory**

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

## NOTES CONCERNING THE INSTRUMENTAL BULLETIN OF THE GEORGETOWN SEISMOLOGICAL OBSERVATORY

Several changes in the matter and form of the Instrumental Bulletin have been introduced during the past two years, and it may prove useful to summarize them at this time, for the benefit of those who have not received copies of all previous numbers.

The purpose of this Bulletin is to supply epochs for the computation of origin times and epicentral distances.

Therefore P and S, or in the absence of one or both of these, such prominent phases as might be of service, will be reported, including contradicting evidence if important.

Arrival times of "i" phases will be reported to 1/100 minute; "e" phases to 1/10 minute. *

The decimal system has been adopted, not only in the substitution of hundreths of minute for seconds, but also in the identification number of the earthquakes themselves.

Each quake is numbered according to the date number of the day of the month, and also by the number of hundreths of the day that has elapsed at the time the quake originated. (Arrival time of first motion is substituted when time of origin is unknown)

When a new hour occurs during the progress of a quake the minutes of the previous hour are included, thus: 60, 70, 30, etc.

Since large errors, both personal and instrumental, involved in the reading of unidentified emergent phases call for the rejection of such readings in any scientific investigation, earthquakes which supply no distinct epochs will not be reported.

Actual earth amplitudes and directions will be given only when azimuth determination can be made from P.

Epicentral distances from Georgetown will be given in degrees on great circle arcs; 9° = 1000 Kilometers.

K has been substituted for the ePe of the modified International notation.

## OTHER CHANGES

Clock corrections are now facilitated by the automatic registration of Arlington time signals, three times daily, on the photographic records.

The recording mechanism of the vertical, as well as the location and periods of the horizontal Galitizins have been changed, the constants of which are subjoined.

GALITZIN CONSTANTS

| Component | N-S | E-W | Z |
|---|---|---|---|
| Cal Period $T_1$ | 14.55 sec. | 14.59 sec | 9.08 sec |
| Pend. " $T$ | 14.70 | 14.75 | 9.06 |
| Mu square | -0.07 | 0.0 | -0.02 |
| Transmission Factor K | 93.3 | 95.0 | 304.0 |
| Gal to Drum Distance $A_1$ | 138.5 cms | 138.5 cms | 138.5 cms. |
| Synchronous Magnification | 1070. | 1090. | 738.5 |
| Paper Speed | 30.mm per min. | 30. mm per min. | 30. mm per min. |
| Reduced Pend. Length. | 14.25 cms. | 14.15 cms. | 41.09 cms. |
| Date of test | Nov.29,1931 | Nov.25,1931 | Oct.26, 1931 |

* A table for converting hundreths of minutes to seconds will be enclosed with the next Bulletin, on request.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
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M = Mainka 135k

1932
March

No.183

| | | | h | m | |
|---|---|---|---|---|---|
| 14.17 | | 0 | 04 | 5.+ | |
| | G-Z | e(P?) | | 13.05 | |
| | G-N | eS | | 17.5 | Distance 33° (Measured) |
| | " | eSRl | | 19.4 | |
| | " | M | | 23.3 | |
| 14.95 | | 0 | 22 | 42.53 | |
| | G-Z | iP | | 49.20 | |
| | G-N | iS | | 54.30 | Distance 31° (S-P) |
| | " | iPcS | | 55.81 | |
| | G-Z | M | | 62.1 | |
| 19.48 | | | | | |
| | G-Z | e | 11 | 27.6 | |
| | G-N | i | | 28.5 | |
| | " | e | | 43.7 | |
| | G-NEZ | M | | 59.0 | |
| 25.99+ | | 0 | 23 | 58.5 | |
| 26.01 | G-ZNE | iP | 00 | 07.50 | Dil. 7.7mu N, 6mu W |
| | G-NE | iS | | 14.72 | Azimuth 322° |
| | G-E | iSRl | | 18.32 | Distance 50° (S-P) |
| | " | L | | 21.3 | |
| | " | M | | 24.8 | |
| 27.99+ | | | | | |
| | G-Z | i | 23 | 55.40 | |
| | " | M | | 59.0 | |
| 31.80 | G-Z | e | 19 | 14.5 | |
| | G-ZNE | i | | 16.24 | Short period, no L waves. |

Microseismic storms: a Beginning March 6, 8hrs. Max. Mar.7, 00 to 15hrs
Ending abruptly March 11, 7h38m. ($T_e$=5sec. Trace range 8mm)
(Low barometer: Mar.6, 20h)
b Beginning Mar. 28, 4h.
Ending " 29, 18h.

Note: Short period waves(1.8sec) from Manistique blast (March 16, 21h 2.0lm) registered at 21h 7.05m., G-Z; 7.22m., G-E, probably S*

J.S.O'C., S.J.

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# Instrumental Bulletin

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1932 No.184
April

| | | | h | m | |
|---|---|---|---|---|---|
| 4.80 | | e | 19 | 17.(Ca) | |
| | G-Z | P | | 34.2 | |
| | G-N | pPP | | 39.85 | Distance 104° |
| | G-E | S | | 41. | No surface waves |
| 14.08 | G-E | i | 01 | 50.30 | |
| | G-E | i | | 50.84 | |
| | G-Z | M | | 55.1 | |
| 16.13 | G-Z | e | 03 | 10.96 | |
| | " | M | | 17. | |
| 22.22 | G-Z | iP | 05 | 17.72 | |
| | G-E | L | | 65.14 | |
| | G-N | M | | 81.7 | |
| 24.26 | G-NE | S | 06 | 22.58 | $\phi$ = 6h 11m (JSA) |
| | " | L | | 26.2 | Distance 31°(Measured) |
| | G-N | M | | 27.7 | |
| 26.33 | | 0 | 07 | 54.8 | |
| | G-ZN | iP | 08 | 05.35 | |
| | G-E | iS | | 13.94 | Distance 63° (S-P) |
| | " | L | | 21. | |
| | " | M | | 28.9 | Surface waves small |
| 29.76 | | 0 | 18 | 18.5 | |
| | G-Z | iP | | 29.30 | |
| | G-E | S | | 38.11 | Distance 64° (S-P) |
| | " | L | | 50.3 | |
| | " | M | | 54.6 | |

GALITZIN CONSTANTS

| Component | N-S | E-W | Z |
|---|---|---|---|
| Gal period $T_1$ | 14.55sec | 14.59sec | 9.08sec |
| Pend " T | 14.70 | 14.75 | 9.06 |
| Mu Square | -0.07 | 0.00 | -0.02 |
| Transfer Factor K | 93.3 | 95.0 | 304.0 |
| Distance Gal to Drum | 138.5 cms | 138.5 | 138.5 |
| Synchronous Magnification | 1070 | 1090 | 738 |
| Date of test | Nov.29,1931 | Nov.25,1931 | Oct.26,1931 |

J.S.O'C. S.J.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
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# Instrumental Bulletin

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W = Wiechert 200k
M = Mainka 135k

No.185

| 1932 May | | | h | m | |
|---|---|---|---|---|---|
| 14.55 | | 0 | 13 | 11.3 | |
| | G-Z | eP | | 27.64 | |
| | " | iP' | | 30.32 | Distance 136°(Measured) |
| | " | PR1 | | 33.09 | |
| | G-NZ | SKP | | 34.3 | |
| 21.42 | | 0 | 10 | 10.18 | |
| | G-NEZ | iP | | 15.91 | Compression; 50 microns N |
| | G-N | eS | | 20.51 | 24 " E |
| | G-NE | iS | | 20.59 | Distance 26.4°;Azimuth 25.5° West of South |
| | | | | | Epicenter:14.3°N 88.5°W |
| 22.48 | | 0 | 11 | 29.58(Ca) | |
| | G-Z | eP | | 44.41 | |
| | " | ePR1 | | 48.18 | Distance 105°(Ca;PR1-P) |
| | " | ePS | | 57.63 | |
| 22.95 | | 0 | 22 | 40.+ | |
| | G-Z | eP | | 45.72 | |
| | G-N | iS | | 50.38 | Distance 26.4° |
| | G-EN | M | | 55.1 | |
| 26.67 | | 0 | 16 | 09.+ | (USCGS 0=16,09.55) |
| | G-Z | eP | | 23.88 | |
| | " | epP | | 25.85 | Distance 115° |
| | " | iPR1 | | 28.76 | (Focal depth assumed =.03) |
| | " | epPP | | 30.56 | |
| | " | PR2 | | 31.5 | |
| | " | PKKP | | 37.8 | |
| | G-E | SR1 | | 44.2 | |
| | " | sSS | | 47.4 | |
| 28.10 | | 0 | 02 | 21.6 | |
| | G-Z | PR1(?) | | 40.03 | |
| | G-N | SKS | | 46.27 | Distance 103°(?) |
| | " | PS | | 48.02 | |
| | " | M | | 80.+ | |
| 31.37 | | | | | |
| | G-N | i | 08 | 52.88 | |
| | G-E | M | | 59.3 | |

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1932 June — No. 86

| | | | h | m | |
|---|---|---|---|---|---|
| 3.44 | | 0 | 10 | 36.6 | |
| | G-Z | eP | | 43.05 | |
| | G-NEZ | iP | | 43.42 | Compression; 64mu N; 81mu E. |
| | W-NE | eS | | 48.59 | Azimuth 51.7° West of South |
| | W-NE | iS | | 48.88 | Distance 34° (S-P) |
| | W-NE | M | | 56.2 | Epicenter (GU) 13.6°N;104°W |
| | W-NE | $M_1$ | | 57.9 | |
| | Aftershocks at: | | | | |
| 3.70 | G-Z | eP | 16 | 45.0 | |
| 3.74 | " | e | 17 | 46.35 | |
| 4.11 | " | e | 02 | 49.2 | |
| 4.91 | " | eP | 21 | 45.8 | |
| | " | i | 21 | 57.00 | |
| 5.38 | | 0 | 09 | 04.35(?) | |
| | G-Z | P | | 10.97 | |
| | G-N | eS | | 16.4 | Distance 32.2° (S-P) But identification doubtful. |
| | " | M | | 23.9 | |
| | " | $M_1$ | | 27.1 | |
| 6.36 | | 0 | 08 | 44.6 | |
| | G-ZE | eP | | 51.48 | |
| | G-NE | S | | 57.0 | Distance 33.5° (S-P) |
| | G-Z | M | | 63.0 | |
| 6.49 | | 0 | 11 | 49.8 | |
| | G-Z | iP | | 54.37 | |
| | G-E | iS | | 57.98 | Distance 19.8° (S-P) |
| | " | M | | 61.7 | |
| 8.22 | G-Z | e | 05 | 09.95 | |
| | " | i | | 19.80 | |
| | " | M | | 24.45 | |
| 8.33 | " | e | 08 | 01.65 | |
| | " | M | | 23.3 | |
| 9.20 | G-N | e | 04 | 42.75 | |
| | " | e | | 47.32 | |
| | | L | | 53.6 | |
| | | M | | 55.4 | |
| 10.86 | G-Z | iP | 20 | 40.44 | |
| | " | i | | 43.74 | |
| 18.43 | | 0 | 10 | 12.5 | |
| | G-Z | eP | | 18.4 | |
| | G-NEZ | iP | | 18.72 | Compression; 18mu N; 24mu E. |
| | W-NE | S | | 23.23 | Azimuth 53° West of South |
| | " | M | | 28.7 | Distance 29.8° (S-eP) |
| | | $M_1$ | | 31.8 | Epicenter (GU) 18.6°N; 102.5°W. |
| 20.38 | G-Z | P | 09 | 07.67 | |
| | G-N | L | | 16.0 | |
| | " | M | | 21.1 | |
| 20.40 | G-Z | i | 09 | 33.81 | |
| | G-N | i | | 39.7 | |
| | " | M | | 47.2 | |
| 22.54 | | 0 | 12 | 59.0 | |
| | G-Z | eP | 13 | 05.73 | |
| | G-NE | S | | 11.15 | Distance 33°(?)(S-P) Several degrees |
| | G-NE | iM | | 17.29 | greater than measured distance to USCGS epicenter. |

J.S.O'C., S.J.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1932 No.187

| July | | | h | m | |
|---|---|---|---|---|---|
| 7.68 | | 0 | 16 | 15.8 | Computed from S-P |
| | G-EZ | eP | | 22.21 | |
| | -Z | P | | 22.24 | |
| | -Z | PR1 | | 23.43 | |
| | -E | iS | | 27.36 | Distance 30.3° |
| | -E | M | | 32.53 | |
| 12.81 | | 0 | 19 | 24.1 | Computed from S-P |
| | G-Z | P | | 30.47 | |
| | -N | S | | 35.46 | Distance 29.8° |
| | -NEZ | M | | 41.2 | |
| 20.85 | G-Z | e | 20 | 25.1 | |
| | -Z | i | | 25.78 | |
| | -E | i | | 30.73 | |
| | -Z | i | | 34.80 | |
| | -E | M | | 63.8 | |
| 21.54 | G-Z | e | 12 | 59.14 | |
| | -Z | i | | 62.56 | |
| | -E | i | | 71.78 | |
| | -Z | M | | 105.0 | |
| 25.38 | | 0 | 9 | 12.7 | Computed from |
| | G-Z | eP | | 19.06 | |
| | -Z | iPR1 | | 19.99 | Early for PR1 |
| | -N | eS | | 24.29 | Distance 30.6° |
| | -N | iS | | 24.42 | |
| | -N | eL | | 27.4 | |
| | -N | M | | 32.0 | |

Instrumental Constants.

| | G-N | G-E | G-Z |
|---|---|---|---|
| $T_1$ | 14.55 | 14.69 | 9.08 |
| T | 14.70 | 14.75 | 9.06 |
| Mu square | -.07 | 0.0 | -.02 |
| Synchronous Magnification | 1070 | 1090 | 739 |
| Date | Nov.29,1931 | Nov.25,1931 | )Oct.26,1931 |

J.S.O'C.S.J.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38^\circ\ 54'\ 25''$ N
$\lambda = 77^\circ\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
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# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k



| 1932 August | | | h | m | |
|---|---|---|---|---|---|
| 12.15 | | 0 | 3 | 24.2 | Computed from S-P |
| | G-NEZ | iP | | 34.21 | Com from NW |
| | -NE | iS | | 42.53 | Distance 61° |
| | -NE | SR1 | | 46.8 | |
| | -NE | eL | | 53.1 | |
| 13.89 | G-Z | eP | 21 | 15.58 | Identification of phases doubtful. |
| | -Z | iP' | | 18.32 | |
| | -NEZ | PR1 | | 19.25 | |
| | -NE | eL | | 61 | |
| 14.03 | | | 0 | 47 | Drum stopped. |
| 14.28 | | | 6 | 43 | Drum started. |
| 17.37 | | 0 | 8 | 47.6 | Computed from S-P |
| | G-Z | e | | 52.5 | |
| | -NEZ | P | | 52.75 | |
| | -E | iS | | 57.29 | Distance 25.4°; e57.1 on N, e57.2 on Z |
| | -NEZ | eL | | 59 to 63 | |
| 18.85 | | 0 | 20 | 24.0 | Computed from S-P |
| | G-EZ | eP | | 30.2 | |
| | -NEZ | eS | | 35.1 | Distance 30.4° |
| | -NEZ | eL | | 37 to 42 | |
| 19.76 | | 0 | 18 | 8.9 | Computed from S-P |
| | G-NZ | eP | | 13.51 | |
| | -NE | iS | | 17.82 | Distance 24.8°; e on Z. |
| | -NE | eL | | 20.4 | |
| 21.19 | | 0 | 4 | 26.3 | Computed from S-P |
| | G-Z | eP | | 34.7 | |
| | -NZ | e | | 37.6 | Late for PR1 |
| | -NZ | eS | | 41.3 | Distance 44° |
| | -NEZ | eSR1 | | 44.7 | |
| | -NEZ | eL | | 47 to 49 | |
| 24.16 | | 0 | 3 | 48.2 | Computed from S-P |
| | G-NE | eP | | 51.9 | Z out of balance |
| | -N | iS | | 55.25 | Distance 18°; e on E |
| | -NE | eL | | 57.5 | |
| 25.34 | | 0 | 8 | 6.0 | Computed from S-P |
| | G-EZ | eP | | 12.3 | |
| | -NE | ePR1 | | 13.2 | |
| | -NEZ | iS | | 17.65 | Distance 33° |
| | -NEZ | eSR1 | | 19.8 | |
| | -NE | eL | | 21.6 | 22.9 on Z |
| 11.41 | | 0 | 9 | 40.9 | Computed from S-P |
| | G-NEZ | eP | | 52.1 | |
| | -NE | iS | | 61.33 | Distance 71 |
| | -NE | eL | | 71.5 | |

F. W. Sohon, S. J.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D.C.

# Instrumental Bulletin

**of the Georgetown University Seismological Observatory**

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1932 No.189

| Sept | | | h | m | |
|---|---|---|---|---|---|
| 3.51 | | 0 | 11 | 59.6 | Computed from PS - P |
| | G-NEZ | iP | 12 | 12.07 | |
| | -NEZ | PRl | | 15.75 | |
| | -NE | iPS | | 24.04 | Distance 91° |
| | -NE | SRl | | 29.1 | Record removed 12h 38m |
| 5.29 | | 0 | 6 | 54.5 | Computed from S-P |
| | G-N | eP | 7 | 3.9 | Identification of phases doubtful |
| | -NE | S | | 11.9 | Distance 59° |
| | -NE | eL | | 23 to 26 | |
| 14.36 | | 0 | 8 | 43.3 | Computed from S-eP |
| | G-NEZ | eP | | 52.0 | |
| | -EZ | iP | | 52.32 | |
| | -N | iS | | 59.07 | Distance 49°; eE at 58.7 |
| | -N | eL | | 64.4 | |
| 15.59 | | 0 | 13 | 54.9 | Computed from PS-PRl |
| | G-Z | eP' | 14 | 14.8 | |
| | -Z | ePRl | | 15.5 | |
| | -Z | iPS | | 25.80 | Distance 123°; e on E |
| | -Z | eL | | 53.2 | |
| 23.60 | | 0 | 14 | 22.5 | Computed from S-P |
| | G-NEZ | iP | 15 | 34.74 | Deep focus |
| | -NEZ | iS | | 44.80 | Distance 79° |
| | | eL | inconspicuous | | |
| 26.81 | | 0 | 19 | 21.0 | Computed from S-P |
| | G-Z | iP | | 32.23 | Later on N and E |
| | -NEZ | S | | 41.8 | Distance 74° |
| | -NEZ | eL | | 53 | |
| 29.17 | | 0 | 3 | 57.3 | Computed from S-P |
| | G-NEZ | iP | 4 | 8.82 | |
| | -NE | iS | | 18.30 | Distance 73° |
| | -NEZ | eL | | 30 to 34 | |
| 29.74 | | 0 | 17 | 46.5 | Computed from S-P |
| | G-Z | eP | | 59.0 | |
| | -E | iS | | 69.41 | Distance 83° |
| | -EZ | eL | difficult | | (G-N not legible) |

Instrumental Constants

| | G-N | G-E | G-Z |
|---|---|---|---|
| $T_1$ | 14.55 | 14.59 | 9.08 |
| T | 14.70 | 14.75 | 9.06 |
| Mu square | - .07 | 0.0 | - .02 |
| Synchr. Magn. | 1070 | 1090 | 739 |
| Date | Nov.29,1931 | Nov.25,1931 | Oct.26,1931 |

F. W. Sohon, S.J.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

**of the Georgetown University Seismological Observatory**

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1932 No 190

| Oct | | | h | m | |
|---|---|---|---|---|---|
| 2.71 | | 0 | 3 | 59.1 | Computed from S-P |
| | G-NEZ | iP | | 5.17 | Com. from SW |
| | -N | iS | | 9.97 | Distance 28.6° |
| | -NEZ | i | | 10.35 | |
| | -NEZ | eL | | 13 ca | |
| 16.51 | | 0 | 12 | 7.9 | Computed from S-P |
| | W-NE | P | | 17.64 | |
| | -N | PR1 | | 20.23 | |
| | -NE | S | | 25.32 | Distance 55° |
| | -N | PS | | 25.58 | |
| | -NE | eL | | 35 | |
| 30.87 | | 0 | 20 | 46.1 | Computed from S-P |
| | G-ZN | eP | | 56.16 | Cf. infra |
| | -EZ | iPcP | | 56.72 | Clearly not beginning of quake |
| | -NE | iS | | 64.15 | Distance 58° |
| | -NE | iScS | | 66.24 | |
| | -NEZ | eL | | 71 ca | |

If the phase listed as PcP is called P, then
0 = 20h 47.3m and distance = 53°.

In these bulletins, the best adjustment to the travel-time curves is reported, disregarding data from other stations.

Constants of the Wiechert November 5, 1932.

| Component | W-N | W-E |
|---|---|---|
| Period | 4.8 sec | 4.1 sec |
| Magnification | 191 | 188 |
| Damping | 3.6 | 3.9 |
| Friction $r''/T^2$ | .011 | .015 mm/sec$^2$ |

Heavy microseisms have prevented a determination of constants of the Galitzin instruments.

F. W. Sohon, S.J.

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$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

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W = Wiechert 200k
M = Mainka 135k

1932
Nov

No.191

| | | | h | m | |
|---|---|---|---|---|---|
| 2.46 | | O | 11 | 3.4 | Computed from S-P |
| | G-Z | iP | | 14.58 | Dil |
| | -Z | iPRl | | 17.65 | |
| | -Z | i | | 23.26 | |
| | -E | iS | | 23.80 | Distance 70° |
| | -NZ | eL | | 37.1 | |
| 13.20 | | O | 4 | 47.1 | Computed from S-P |
| | G-NEZ | iP | | 59.55 | Com from SW |
| | -N | iS | | 69.98 | Distance 83° |
| | Deep focus type. Many inconsistent impulsive phases. | | | | |
| 17.25 | | O | 6 | 2.4 | Computed from S-P |
| | G-NZ | eP | | 9.20 | |
| | -NEZ | iPRl | | 10.00 | |
| | -NE | iS | | 14.46 | Distance 32.4° |
| | -NEZ | eL | | 19 ca | |
| 26.17 | | O | 4 | 24.6 | Computed from S-P |
| | G-Z | i? | | 36.91 | Local? |
| | -NEZ | iP | | 37.29 | |
| | -NEZ | iS | | 47.93 | Distance 85° |
| | -EZ | eL | | 63 | |
| | No clock marks on G-N, but the three drums are on one shaft, and the lights are all on the same switch. | | | | |
| 29.47 | | O | 11 | 11.1 | Computed from S-P |
| | G-Z | iP | | 22.27 | |
| | | ePRl | | 25.05 | |
| | | iS | | 31.35 | Distance 69° |
| | | eL | | 45.7 | |

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

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W = Wiechert 200k
M = Mainka 135k

No.192

1932
Dec

| | | | h | m | |
|---|---|---|---|---|---|
| 4.17 | | 0 | 4 | 3.9 | Computed from S-P |
| | G-EZ | P | | 10.58 | |
| | -NE | eS | | 15.7 | Distance 31.2° |
| | -NEZ | eL | | 18 | |
| 4.34 | | 0 | 8 | 10.9 | Computed from SKKS-P' |
| | G-NEZ | iP' | | 30.61 | |
| | -NZ | iPR1 | | 33.27 | |
| | -NE | iSKP | | 34.15 | |
| | -NE | iSKKS | | 40.12 | Distance 140° |
| | | eL | uncertain | | |
| 4.44 | | 0 | 10 | 47.9 | Computed from S-P |
| | G-Z | iP | | 52.34 | |
| | -NZ | iS | | 55.76 | Distance 18.6° |
| 7.68 | | 0 | 16 | 21.5 | Computed from S-P |
| | G-NEZ | iP | | 28.45 | Com. from SW |
| | -NE | S | | 33.75 | Distance 33.2° |
| | -NZ | eL | | 38 0r 39 | |
| 9.36 | | 0 | 8 | 34.2 | Computed from S-P |
| | G-NZ | iP | | 43.75 | |
| | -NE | iS | | 51.29 | Distance 53.5° |
| | -NZ | eL | | 60 | Uncertain |
| 19.27 | | 0 | 6 | 28.7 | Computed from PcS-PR1 |
| | G-NZ | eP | | 35.2 | |
| | -NEZ | iPR1 | | 35.72 | |
| | -Z | i | | 36.18 | |
| | -NEZ | eS | | 39.8 | Poor |
| | -N | iPcS | | 41.70 | Distance 28.6° |
| | | eL | | 44 but very uncertain. | |
| 21.26 | | 0 | 6 | 9.7 | Computed from S-P |
| | G-NZ | iP | | 16.49 | |
| | -N | S | | 21.64 | Distance 31.8° |
| | | L | Not legible | | |
| 25.04 | | 0 | 2 | 4.1 | Computed from PS-P |
| | G-NZ | eP | | 18.35 | |
| | -NZ | i | | 18.43 | |
| | -N | iPR1 | | 22.48 | |
| | -NZ | ePS | | 31.5 | Distance 103° |
| | | L | Not legible. | | |

Instrumental Constants.

| | G-N | G-E | G-Z |
|---|---|---|---|
| $T_1$ | 14.6 | 14.6 | 9.1 |
| $T$ | 15.0 | 15.2 | 8.9 |
| $Mu^2$ | .17 | .08 | .31* |
| $V_s$ | 1100 | 1120 | 550 |
| Date | Dec.31,1932 | Dec.31,1932 | Dec.29,1932 |

* The magnets on G-Z, which was set up in 1923, are growing weak. They cannot be brought any closer together without binding the vane.

F.W.Sohon, S.J.

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φ = 38° 54′ 25″ N
λ = 77° 4′ 24″ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = — .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

**of the Georgetown University Seismological Observatory**

Spindler & Hoyer Clock corrected three times daily by NAA
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M = Mainka 135k

1933 No.193

This bulletin is intended to convey only such information as may assist in the statistical determination of time of origin and co-ordinates of epicenter. The selection of material is as follows:

Unidentified emergent phases are not reported.

Identified emergent phases, if probably useful, are reported, the arrival time being given to the nearest 1/10 minute.

Unidentified distinct phases are reported to 1/100 minute. But if they are numerous, only those probably important will be reported.

Identified distinct phases are reported to 1/100 minute, and the key phases are noted. If the key phases are sure, other phases will only be enumerated if remarkable. If the identification is weak, other phases presenting confirmatory or contradictory evidence will be reported.

Where readings from more than one component are available, the observer uses his judgment as to which to accept. Arrival times credited to more than one component are always obtained by averaging the several readings.

eL appearing alone or accompanied by unidentified emergent phases will not be reported. Quakes vitiated by locals or micros are not reported except as indicated above, for the fact that an earthquake has occurred at such an approximate time will already be known to those for whom these bulletins are intended.

As the complicated symbol $\overline{{}_cP_c}$ presents difficulties in typing, it is replaced in all combinations by the symbol K.

$V_s$ is the synchronous magnification, or dynamic magnification for a sustained simple harmonic motion of the same period as the pendulum.

1933
January

| | | | h | m | |
|---|---|---|---|---|---|
| 4.17 | | 0 | 3 | 59.3 | Computed from S-P |
| | G-NEZ | iP | 4 | 8.18 | Dil from NW |
| | -NE | iS | | 15.12 | Distance 48.2° |
| | -Z | eL | | 22 | |
| 18.36 | | 0 | 8 | 37.9 | Computed from PS-P |
| | G-Z | eP | | 50.6 | |
| | -Z | ePRl | | 53.9 | |
| | -N | eS | | 61.2 | |
| | -NE | ePS | | 62.0 | Distance 85° |
| | -NEZ | eSRl | | 67.1 | |
| | -NZ | eL | | 79 | |
| 21.81 | | 0 | 19 | 20.9 | Computed from SKS-PRl |
| | G-Z | iP' | | 40.72 | |
| | -Z | iPRl | | 43.61 | |
| | -N | iSKS | | 47.76 | Distance 144° |
| | -N | eSRl | | 63.0 | |
| | -Z | eL | | 89 | |

Instrumental Constants

| | G-N | G-E | G-Z |
|---|---|---|---|
| $T_1$ | 14.6 | 14.6 | 9.1 |
| T | 15.0 | 15.2 | 8.9 |
| $Mu^2$ | .17 | .08 | .31 |
| $V_s$ | 1100 | 1120 | 550 |
| Date of test | Dec.31,1932 | Dec.31,1932 | Dec.29,1932 |

F. W. Sohon, S.J.

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$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
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b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

**of the Georgetown University Seismological Observatory**

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1933 No.194
Feb

| | | | h | m | |
|---|---|---|---|---|---|
| 3.92 | | 0 | 22 | 11.7 | Computed from S-P |
| | G-NEZ | iP | | 24.28 | Com from NW |
| | -NEZ | eS | | 34.6 | Distance 82° |
| | -Z | eL | | 48 ca | |
| 18.82 | | 0 | 19 | 45.4 | Computed from S-P |
| | G-NZ | iP | | 51.02 | Dil from S |
| | -N | iS | | 55.29 | Distance 24.5° |
| | -N | eL | | 57 or 58 | |
| 23.34 | | 0 | 8 | 9.3 | Computed from S-P |
| | G-NEZ | iP | | 19.30 | Com from SE |
| | -NEZ | S | | 27.37 | Distance 58° |
| | -Z | eL | | 37 | |

Instrumental Constants

| Component | G-N | G-E | G-Z |
|---|---|---|---|
| Period of Galv | 14.6 | 14.6 | 9.1 |
| Period of Pend | 15.0 | 15.2 | 8.9 |
| Mu Square | .17 | .08 | .31 |
| Synchr. Magn. | 1100 | 1120 | 550 |
| Date of Test | Dec.31,1932 | Dec.31,1932 | Dec.29,1932 |

IMPORTANT NOTICE

The mailing list is to be corrected and revised June 1933, and the new list is to be made up from the enclosed forms which should be corrected and returned as soon as possible to

SEISMOLOGICAL OBSERVATORY
GEORGETOWN UNIVERSITY
WASHINGTON,D.C.

F.W.Sohon,S.J.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1933 No.195

| March | | | h | m | |
|---|---|---|---|---|---|
| 2.73 | | 0 | 17 | 30.9 | Computed from S-P |
| | G-Z | iP | | 44.21 | |
| | W-E~~R~~ | ~~P~~R1 | | 47.82 | |
| | -E | SKS | | 54.82 | |
| | -E | S | | 55.54 | Distance 92° |
| 11.08 | | 0 | 1 | 53.7 | Computed from S-P |
| | G-Z | iP | 2 | 0.76 | |
| | -N | iS | | 6.11 | Distance 33.6° |
| | -NZ | eL | | 11.5 | |
| 11.82 | | 0 | 19 | 39.1 | Computed from S-P |
| | G-Z | eP | | 50.45 | |
| | -NEZ | iP | | 50.55 | |
| | -NE | i | | 50.83 | |
| | -NE | i | | 56.62 | Also others |
| | -NEZ | iS | | 59.88 | Distance 72° |
| | -NZ | eL | | 71 | |
| 12.~~b~~8 | | 0 | 4 | 25.7 | Computed from S-P |
| | G-ZN | iP | | 31.32 | |
| | -NE | S | | 35.61 | Distance 24.7° |
| | -NE | eL | | 37 | |
| 13.57 | G-NEZ | i | 13 | 35.88 | |
| | -E | i | | 35.46 | |
| | -N | i | | 35.55 | |
| | -EZ | eL | | 37.2 | |
| | -EZ | M | | 38.2 | |
| 14.06 | | 0 | 1 | 28.1 | Computed from S-P |
| | G-EZ | P | | 40.49 | |
| | *NEZ | S | | 50.72 | Distance 81° |
| | -Z | eL | | 61 | |
| 17.66 | | 0 | 15 | 55.3 | Computed from S-P |
| | G-NZ | iP | 16 | 7.01 | |
| | -N | iS | | 16.75 | Distance 75° |
| | -NZ | eL | | 29 | |
| 18.98 | | 0 | 23 | 32.5 | Computed from S-P |
| | G-NZ | iP | | 38.11 | |
| | -NEZ | i | | 38.19 | |
| | -NZ | PR1 | | 38.60 | |
| | -N | S | | 42.45 | Distance 25.1° |
| | -NEZ | eL | | 44 | |

Constants of the Wiechert December 26, 1932.

| Mass | 200 Kg | |
|---|---|---|
| Component | W-N | W-E |
| Period | 6.4 sec | 4.8 sec |
| Magnification | 111 | 123 |
| Damping | 4.1 | 3.1 |
| Friction | .034 | .034 mm/sec$^2$ |

If you have not done so already, please send in your corrected address immediately, if you wish to continue to receive the bulletins.

F. W. Sohon, S.J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

No. 109 bis. *From* *to* 1924

# Washington, D. C.

# Seismological Bulletin

## of the Georgetown University Department of Geology

$\phi$=38° 54′ 25″ N  $\lambda$=77° 4′ 24″ W  h=42.4 m  Sub-Soil, Decayed Diorite

Instruments: Astatic pendulums after Wiechert, 200 kg. (horizontal), 80 kg. (vertical). Astatic pendulums after Mainka, 135 kg., two Bosch-Omori pendulums 25 kg. and two Bosch Photographic pendulums (horizontal) 200 gms.

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | $\varepsilon$:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 21 | | $e^P_E$ | 10 18 54 | | | | | | |
| | | $e^P_N$ | 10 18 54 | | | | | | |
| | | $e^S_E$? | 10 24 55 | | | | | | |
| | | $e^L_E$ | 10 28.4 | | | | | | |
| | | $e^L_N$ | 10 28.4 | | | | | | |
| | | F | 10 54 | | | | | | |
| May 21 | | $e_E$ | 1 45 07 | | | | | | No other phases sure. |
| | | $e_N$ | 1 44 30 | | | | | | |
| | | F | 1 55 | | | | | | |
| May 28 | | $e^P_E$ | 10 03 48 | | | | | | Heavy micros. |
| | | $e^P_N$ | 10 03 48 | | | | | | |
| | | $i^S_E$ | 10 13 36 | | | | | | No L or M apparent. |
| | | $e^S_N$ | 10 13 36 | | | | | | |
| | | $e^L_E$ | 10 26.5 | 11 | | | | | |
| | | F | 10 55 | | | | | | |

Francis A. Tondorf., S. J.
Director.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| May 1 | | $_e P_E$ | 20 00 10 | | | | | | No distinct $M_N$. Micros. |
| | | $_e P_N$ | 20 00 14 | | | | | | |
| | | $S_E$ | 20 05 12 | | | | | | |
| | | $S_N$ | 20 05 02 | | | | | | |
| | | $_e L_E$ | 20 7.4 | | | | | | |
| | | $_e L_N$ | 20 7.3 | | | | | | |
| | | $M_E$ | 20 13 33 | | | 4.3 | mm. | | |
| | | F | 21 10 | | | | | | |
| May 4 | | $_e E$ | 17 10 | | | | | | |
| | | $_e N$ | 17 10 | | | | | | No distinct M. Heavy micros. |
| | | $_e L_E$ | 17 22.4 | | | | | | |
| | | $_e L_N$ | 17 22.4 | | | | | | |
| | | $L_E$ | 17 30 27 | 9 | | | | | |
| | | $L_N$ | 17 31 21 | 11 | | | | | |
| | | F | 17 55 | | | | | | |
| May 6 | | $L_E$ | 17 08 | | | | | | N-S does not show Heavy micros. |
| | | $L_E$ | 17 15 23 | 21 | | | | | |
| | | $L_E$ | 17 30 13 | 16 | | | | | |
| | | F | 17 50 | | | | | | |
| May 17 | | $_e E$ | 4 21 17 | | | | | | L waves of exceedingly small amplitude. N-S does not show. |
| | | $L_E$ | 4 43 28 | | | | | | |
| | | F | 4 56 | | | | | | |
| | | | | | | | | | No records on the 18th. Machines stopped to be oiled. |

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# Washington, D. C.

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | | | |
| | $A_E$ | | | |
| | $A_Z$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | | | |
| | $A_E$ | | | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | | | |
| | $A_E$ | | | |
| Bosch-Omori | $A_N$ | | | |
| | $A_E$ | | | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| March 15 | | $e^{P_N}$ | 10 44 05 | | | | | | |
| | | $e^{S_N}$ | 10 54 29 | | | | | | |
| | | $e^{L_E}$? | 11 11.6 | 16 | | | | | |
| | | $L_E$ | 11 19 28 | 16 | | | | | |
| | | F | 11 55 | | | | | | |
| March 20 | | $L_E$ | 10 13 to | | | | | | |
| March 24 | | | 10 18 | 16 | | | | | Very heavy micros. |
| | | $e^{P_N}$ | 20 36 | | | | | | |
| | | $S_N$? | 20 40 36 | | | | | | |
| | | $e^{L_E}$? | 20 43.3 | 10 | | | | | Phases very difficult. |
| | | $L_E$ | 20 45 | | | | | | Very heavy micros. |
| | | $L_N$ | 20 47 27 | 16 | | | | | |
| | | F | 21 15 | | | | | | |
| March 25 | | $e^{P_E}$? | 14 13 10 | | | | | | $S_N$ uncertain |
| | | $e^{P_N}$ | 14 13 10 | | | | | | |
| | | $S_E$? | 14 20 27 | | | | | | |
| | | $e^{L_E}$ | 14 23.2 | 22 | | | | | |
| | | $e^{L_N}$ | 14 23.2 | | | | | | |
| | | $L_E$ | 14 25 06 | 11 | | | | | |
| | | $L_N$ | 14 26 11 | 15 | | | | | |
| | | F | in following quake | | | | | | |
| March 25 | | $e^{P_E}$? | 15 09 27 | | | | | | Very heavy micros. |
| | | $e^{P_N}$ | 15 09 38 | | | | | | |
| | | $e^{S_E}$? | 15 17 13 | | | | | | |
| | | $e^{L_E}$ | 15 19.9 | 17 | | | | | |
| | | $e^{L_N}$ | 15 19.9 | 17 | | | | | |
| | | $L_E$ | 15 21 11 | 11 | | | | | |
| | | $L_N$ | 15 22 27 | 11 | | | | | |
| | | F | 16 (ca.) | | | | | | |
| March 30 | | $e_E$? | 0 25 | | | | | | Very heavy micros. Gram pronounced but very difficult. |
| | | $e_N$? | 0 25 | | | | | | |
| | | $S_E$? | 0 29 26 | | | | | | |
| | | $S_N$? | 0 29 22 | | | | | | |
| | | F | 1 30 | | | | | | |

Francis A. Tondorf, S. J.,
Director.

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No. *From* March 1 *to* March 31, 19 24

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| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Wiechert Horizontal (200 kg.) Vertical (80 kg.) | $A_N$ | 143 | 5.0 | |
| | $A_E$ | 165 | 5.0 | |
| | $A_Z$ | 80 | 4.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Bosch Photographic Pendulums | $A_N$ | 133 | 5.0 | |
| | $A_E$ | 133 | 5.0 | |

| | | V | $T_o$ | ε:1 |
|---|---|---|---|---|
| Mainka | $A_N$ | 59 | 9.0 | |
| | $A_E$ | 47 | 9.0 | |
| Bosch-Omori | $A_N$ | 14 | 13.5 | |
| | $A_E$ | 11 | 13.7 | |

| Date | Character | Phase | Time | Periods | Amplitude $A_N$ | Amplitude $A_E$ | Amplitude $A_Z$ | Δ | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| March 4 | | $e^P_E$ | 10 13 49 | | | | | | |
| | | $e^P_N$ | 10 13 51 | | | | | | |
| | | $e^S_E$ | 10 18 50 | | | | | | |
| | | $i^S_N$ | 10 18 58 | | | | | | |
| | | $e^L$ | 10 21 | 27 | | | | | |
| | | $M_{E_1}$ | 10 24 58 | 22 | | 9.2 mm. | | | |
| | | $M_{N_1}$ | 10 26 | 11 | 4.0 mm. | | | | |
| | | $M_{E_2}$ | 10 30 | 20 | 3.0 mm. | | | | |
| | | F | In second quake. | | | | | | |
| March 4 | | $e^L_E$ | 11 59.2 | | | | | | All preceding lost in changing of sheets. |
| | | $e^L_N$ | 11 59.2 | | | | | | |
| | | F | 14 (ca.) | | | | | | |
| March 4 | | $e_E$ | 17 31 | | | | | | Very heavy micros. |
| | | $e_N$ | 17 31 | | | | | | |
| | | $L_N$ | 17 34 41 | | | | | | |
| | | F | 17 50 | | | | | | |
| March 5 | | $e^L_E$? | 12 23.4 | 16 | | | | | Very heavy micros. |
| | | F? | 13 (ca.) | | | | | | |
| March 6 | | $e_N$ | 12 36 45 | | | | | | Rest doubtful. Heavy micros. |
| March 7 | | $e_N$? | 18 20 40 | | | | | | Very heavy micros. |
| | | F | in micros. | | | | | | |
| March 11 | | $e^P_N$ | 10 46 45 | | | | | | P and S uncertain. Very heavy micros. |
| | | $e^S_N$? | 10 52 23 | | | | | | |
| | | $e^L_E$? | 10 55.0 | | | | | | |
| | | $e^L_N$? | 10 55.0 | | | | | | |
| | | $L_E$ | 10 57 33 | 16 | | | | | |
| | | $L_N$ | 10 58 | 16 | | | | | |
| | | $M_E$ | 10 58 35 | | | 1.8 mm. | | | |
| | | F | 12 50 | | | | | | |
| March 13 | | $e_E$ | 11 05 | | | | | | Sheets off at 11 hrs. 31 m. Seismic indications then continuing. Very heavy micros. |
| | | $e_N$ | 11 03 | | | | | | |

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# SEISMOLOGICAL DESPATCHES

Received at the

## SEISMOLOGICAL STATION
## GEORGETOWN UNIVERSITY

Washington, D. C.

BUENOS AIRES, July 8, 1924. A sharp earth quake was felt at Cordoba, capital of the Province of Cordoba, at 4.48 P.M. yesterday, according to advices just received. The shock lasted for five seconds, and did minor damage. A. P.

SAN SALVADOR, July 12, 1924. A seismic disturbance of some intensity was felt here today. No damage has been reported. A. P.

TASHKENT, RUSSIAN TURKESTAN, July 15, 1924. Recurrent earthquakes of great intensity have been registered at the seismographical observatory here during the last four days. The center of the shocks is believed to be in the Pamirs on the Indian border. The tremors have been so violent that the seismographical instruments were thrown out of alignment while the walls of the buildings were shaken and furniture in the homes displaced. A. P.

MOSCOW, July 17, 1924. Three persons are reported to have been killed and many houses destroyed by an earthquake at Tashkent, Wednesday. A number of villages felt the shock. A. P.

BRAWLEY, CALIF., July 18, 1924. A sharp earthquake was felt here at 1.30 o'clock yesterday afternoon and was followed by a lighter shock at 3.30. Both shocks were accompanied by a rumbling which has recurred at intervals throughout the day. A. P.

MOSCOW, July 19, 1924. It is reported that a new island has been formed at the entrance to the Sea of Azov as a result of the recent earthquake. A. P.

GUAYAQUIL, EQUADOR, July 22, 1924. An earthquake of considerable violence was felt in many sections of the country last night. Telegraphic communication from here to Quito was interrupted but no other damage was reported. A. P.

CARDIFF, WALES, July 22, 1924. Earth tremors shook several mining villages in the vicinity of Pontypridd this morning and so severely shook up the number of houses that it seemed certain they would collapse, causing the alarmed people to rush into the streets. A fall of stone in one mine killed one miner and injured another. A.P.

MANILA, July 24, 1924. The volcano Babuyan Calaro, on the Island of Babuyan, erupted again July 1, according to information brought here today by the Coast Guard vessel Pathfinder. A. P.

VALENCIA, SPAIN, July 27, 1924. Two earthquake shocks within a quarter of an hour of each other were felt at Carcagente at 11 o'clock Saturday morning. The shocks also were felt by villagers in the neighborhood of Huesca. A. P.

KINGSTON, JAMAICA, July 28, 1924. A slight earth shock was felt here shortly before 2 o'clock this morning. American visitors were somewhat alarmed. The walls of several buildings were slightly cracked. A. P.

LONDON, July 31, 1924. A slight earthquake today caused considerable alarm in the mining country near Maltby main colliery near Rotherham to withdraw for a time 1,000 miners but there was no casualties. It was at first believed that the earth tremor had been caused by an explosion in the colliery. A. P.

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# SEISMOLOGICAL DESPATCHES

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MANILA, P. I. (April 14, 1924 - BELATED). Earthquake South-East of Mindanao, 16 hrs. 22 m. 48 s. G.M.T. Much destruction at Mati. Tsunami flooded low lands. No loss of life. Special Despatch.

MUNICH, BAVARIA, May 13. A slight earthquake shock was felt here yesterday. The center of the disturbance is believed to have been in the Middle Alps. The tremors were noticed only in the upper stories of houses. A. P.

CONSTANTINOPLE, May, 14. (BY THE ASSOCIATED PRESS). A violent earthquake is reported in the region of Erzerum. Several villages have been destroyed and about fifty lives lost. A. P.

CONSTANTINOPLE, May 16. Despatches received today report that further earthquake shocks have been felt at Erzerum, Hassan Kale and Kars. Entire villages in the neighborhood of Hassan Kale are reported to have been destroyed. The number of additional victims is given as 120.

A Constantinople despatch on Wednesday reported the destruction of several villages and the loss of about fifty lives in a violent earthquake in the region of Erzerum. A. P.

HILO, T. H., May 17. (BY THE ASSOCIATED PRESS). The seismograph at Kilauea registered more than one hundred slight eathquakes yesterday, although no shocks were felt in Hilo. A. P.

HILO, T. H., May 20. The volcano today was displaying the most alarming indications. The district is experiencing anumber of minor earthquakes and explosions in the crater are frequent. A. P.

HONOLULU, May 21, 1924. Four heavy earthquake shocks were felt at Naalehu station. A. P.

ROME, May 21. An earthquake was felt on Tuesday at Pievepelago, Pavullo and other places in the Frigano region southwest of Bologna. No harm was done. A. P.

HILO, T. H., May 22. (VOLCANO-BY THE ASSOCIATED PRESS). There was a great many light earthquakes in the Hilea district of this island yesterday, the tremors being almost continuous at times. A. P.

HILO, T. H., May 23, 1924. Another spectacular outbreak occurred at Kilauea volcano this morning, following a sharp earthquake which shock Volcano House. Dust and rocks were thrown for two miles, while thunder rolled and lightning played.

There also was a small explosion at 2:30 this morning after a series of earthquakes, but there was NO ejection of rocks.

HILO, T. H., May 23, 1924. The earthquakes in the Pan district have caused cracks in the earth 200 feet wide, according to Oliver Emerson, the volcanologist. The cracks run parallel to Halemamau, the hottest crater in the volcano, and there are indications that the pit may extend that far; another crack runs southwest from the fire pit to the rim of Kilauea. An inspection of the northeast side of the pit is being made today and if cracks are found there the observatory equipment will be moved. A. P.

HILO, T. H., May 23, 1924. There was an earthquake in the volcano region at nine o'clock yesterday morning. A. P.

Hilo, T. H., May 24, 1924. There were further earthquakes at 10:10 after a cessation of several hours. A severe east and west earthquake occurred in Waiakea and Hilo at one o'clock this morning. Finch fears that the quake is based on a fault line in the Kau and Puna districts and that it may shake the whole island. A.P.

PORT AU PRINCE, HAITI, May 27, 1924. An earthquake shock today wrecked a building at Port-dePaix, killing three persons and injuring several others. A church steeple was demolished and the gendarmarie barracks were badly damaged. The shocks, of ten seconds duration, were distinctly felt at the capital from which the high commissioner sent airplanes to the affected city. A. P.

MOSCOW, May 27, 1924. It is reported here that an earthquake of unprecedented intensity took place at Tashkent last Wednesday. A. P.

Francis A. Tondorf, S. J.,
Director.

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G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1933 Sept — No.201

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 2.70 | G-Z | i | 16 | 58 | 45 | Dil |
| | -NE | i | | 64 | 30 | |
| | -NE | i | | 65 | 14 | |
| | -NE | i | | 67 | 31 | |
| | | eL difficult | | | | |
| 6.94 | | 0 | 22 | 09 | 00 | Computed from PS-PR1 |
| | G-EZ | iPR1 | | 29 | 59 | Com from W.; e on G-N. |
| | -EZ | iPR2 | | 30 | 03 | |
| | -E | i | | 31 | 49 | |
| | -N | iSKS | | 33 | 50 | |
| | -EZ | iPS | | 35 | 47 | Distance 99° |
| | -N | eL | | 55 | | |
| 9.89 | | 0 | 21 | 20 | 10 | Computed from PS-PR1 |
| | G-Z | eP' | | 38 | 35 | No clock marks. Times interpolated |
| | -EZ | PR1 | | 39 | 48 | between NAA time signals. |
| | -E | eSKS | | 45 | 20 | |
| | -NE | PS | | 49 | 28 | Distance 114° |
| | -NE | eSR1 | | 56 | 00 | |
| | -NEZ | eL | | 75 | | |
| 24.64 | | 0 | 15 | 19 | 35 | Computed from S-P |
| | G-NEZ | iP | | 30 | 22 | Com from NW |
| | -NEZ | iS | | 39 | 06 | Distance 65° |
| | -NEZ | eL | | 51 | | |
| 26.79 | | 0 | 18 | 55 | 00 | Computed from PS-PR1 |
| | G-NE | ePR1 | 19 | 09 | 32 | |
| | -N | eSKS | | 15 | 50 | |
| | -NE | ePS | | 18 | 45 | Distance 107° |
| | -NE | eL | | 42 | | |
| 30.60 | | 0 | 14 | 29 | 10 | Computed from PS-P |
| | G-NEZ | eP | | 42 | 39 | |
| | -NE | ePR1 | | 45 | 47 | |
| | -N | eSKS | | 52 | 30 | |
| | -NE | ePS | | 55 | 00 | Distance 95° |
| | -E | eSR1 | | 60 | 00 | |
| | -NEZ | eL | | 77 | | |

F. W. Sohon, S.J.
Director

R. J. Buckley, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1933 No.202
October

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 1.11 | | 0 | 2 | 40 | 20 | Computed from S-P |
| | G-NZ | iP | | 48 | 56 | Dil from M S |
| | -NEZ | eS | | 55 | 34 | Distance 45° |
| | -N | eL | | 64 | ca | |
| 2.65 | | 0 | 15 | 29 | 05 | Computed from S-P |
| | G-NEZ | iP | | 37 | 07 | Com from SW |
| | -E | iS | | 43 | 18 | Distance 41° |
| | -E | iSRl | | 46 | 28 | |
| 25.98 | | 0 | 23 | 28 | 50 | Computed from S-P |
| | G-NEZ | iP | | 38 | 12 | Dil from SW |
| | -NEZ | iS | | 46 | 32 | Distance 59° |
| | -EZ | eL | | 55 | ca | |

F. W. Sohon, S.J.
Director

R. J. Buckley, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

**of the Georgetown University Seismological Observatory**

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W = Wiechert 200k
M = Mainka 135k

1933 No. 203
November h m s

1 to 4 inclusive instruments not in operation.

| | | | | | | |
|---|---|---|---|---|---|---|
| 14.59 | | 0 | 14 | 05 | 10 | Computed from S-P |
| | G-Z | iP | 14 | 16 | 28 | Dil.; G-N out of balance. |
| | -Z | PcP | | 17 | 11 | |
| | -EZ | iS | | 25 | 43 | Distance 70° |
| | -E | iPS | | 28 | 33 | |
| | -EZ | eSRl | | 30 | 28 | |
| | | eL | difficult. | | | |
| 20.97 | | 0 | 23 | 21 | 07 | Computed from S-P |
| | G-NEZ | iP | 23 | 28 | 21 | Com from NE |
| | -Z | iPcP | | 30 | 29 | |
| | -NEZ | iS | | 33 | 52 | Distance 34.8° |
| | Remainder of record not legible. | | | | | |
| 23.79 | | 0 | 18 | 58 | | Computed from S-P |
| | G-NZ | iP | 19 | 4 | 05 | Com. from S.; G-E out of balance. |
| | -NZ | eS | | 8 | 55 | Distance 28° |
| | -Z | eL | | 13 | | |
| | -Z | iScS | | 14 | 15 | |

Constants of the Wiechert (200 Kg)

| Component | W-N | W-E |
|---|---|---|
| Period | 4.1 | 3.7 sec |
| Magnification | 63 | 73 |
| Damping | 2.6 | 1.3 |
| Friction $r/T^2$ | .015 | .023 |

Date of test: December 3, 1933.

F. W. Schon, S.J.
Director.

R. J. Buckley, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

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# Instrumental Bulletin

**of the Georgetown University Seismological Observatory**

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W = Wiechert 200k
M = Mainka 135k

1933 Dec — No. 204

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 2.84 | | 0 | 20 | 06 | 05 | Computed from S-PR1 |
| | G-NE | eP | | 19 | 34 | |
| | -Z | ePR1 | | 23 | 21 | |
| | -NEZ | iS | | 30 | 54 | Distance 95° |
| | -NZ | eL | | 52 | | |
| 4.82 | | 0 | 19 | 34 | 15 | Computed from S-P |
| | G-NEZ | iP | | 46 | 04 | Com from NW |
| | -NEZ | iS | | 55 | 55 | Distance 77° |
| | -Z | i | | 56 | 12 | |
| 12.59 | | 0 | 14 | 11 | 05 | Computed from PS-P' |
| | G-Z | iP' | | 30 | 09 | |
| | -EZ | iPS | | 42 | 04 | Distance 125° |
| | -NZ | e | | 42 | 48 | |
| | -NEZ | eL | | 72 | | |
| 13.89 | | 0 | 21 | 23 | 48 | Computed from S-P |
| | G-NEZ | iP | | 30 | 04 | Dil from SW |
| | -N | iS | | 35 | 12 | Distance 30.3°; e later on EZ |
| | -NZ | eL | | 38 | | Many phases show. |
| 14.30 | | 0 | 7 | 16 | 50 | Computed from S-P |
| | G-Z | eP | | 23 | 18 | |
| | -NEZ | i | | 23 | 42 | |
| | -NE | iS | | 28 | 03 | Distance 29°; i 28:18 on Z |
| | -E | eL | | 32 | | |
| 15.32 | | 0 | 7 | 41 | 30 | Computed from S-P |
| | G-NEZ | iP | | 48 | 42 | Dil |
| | -NEZ | eS | | 54 | 10 | Distance 34.2° |
| 19.24 | | 0 | 5 | 37 | 50 | Computed from S-P |
| | G-NEZ | eP | | 48 | 17 | |
| | -NE | eS | | 56 | 42 | Distance 61° |
| | -NEZ | eL | | 66 | | |
| 19.75 | | 0 | 17 | 58 | 30 | Computed from S-P |
| | G-E | e | 18 | 02 | 10 | |
| | -E | iP | | 02 | 34 | e on N and later on Z |
| | -NZ | iS | | 05 | 33 | Distance 16.4°: other impulses |
| | -NZ | eL | | 07 | 30 | |
| | -N | i | | 08 | 55 | |
| | -Z | i | | 09 | 01 | |

Instrumental Constants.

| | G-N | G-E | G-Z |
|---|---|---|---|
| Period of Galvanometer | 14.6 | 14.6 | 9.1 |
| Period of Pendulum | 14.1 | 14.6 | 8.9 |
| Mu square | +.02 | +.11 | -.10 |
| Synchronous Magnification | 988 | 1034 | 570 |
| Date of test | Jan. 6, 1934 | Jan. 5, 1934 | Jan. 6, 1934 |

F. W. Sohon, S.J.
Director.

R. J. Buckley, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

φ = 38° 54′ 25″ N
λ = 77° 4′ 24″ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = — .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
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W = Wiechert 200k
M = Mainka 135k

1934 No.205
January

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 3.40 | | 0 | 9 | 42 | 37 | Computed from S-P |
| | G-NEZ | iP | | 53 | 56 | Dil from NW |
| | -NEZ | iS | | 63 | 19 | Distance 72° |
| | -Z | L | | 80 | | Doubtful. |
| 11.64 | | 0 | 10 | 21 | 50 | Computed from S-P |
| | G-NEZ | eP | | 32 | 44 | |
| | -NE | iS | | 41 | 36 | Distance 67° |
| | -NEZ | eL | | 55 | | |
| 15.36 | | 0 | 8 | 43 | 12 | Computed from PS-PR1 |
| | G-Z | e | | 57 | 26 | |
| | -NEZ | eP | | 58 | 16 | |
| | -Z | eP' | | 61 | 15 | |
| | -NZ | iPR1 | | 62 | 58 | |
| | -NZ | iPS | | 72 | 43 | Distance 115° |
| 28.80 | | 0 | 19 | 10 | 17 | Computed from S-P |
| | G-NEZ | iP | | 16 | 10 | Com. from SW |
| | -NEZ | iS | | 20 | 39 | Distance 26.4°; W-NE 21:09, |
| | | L | Not legible. | | | Dist. 30° |
| | | | | | | 0 = 9m 40s. |
| 30.81 | | 0 | 19 | 23 | 40 | Computed from S-P |
| | G-NZ | eP | | 30 | 30 | |
| | -NZ | eS | | 35 | 45 | Distance 32.3° |
| | -N | eL | | 40 | 22 | |
| | -Z | i | | 40 | 44 | |
| | -Z | i | | 43 | 36 | |
| 30.84 | | 0 | 20 | 16 | 16 | Computed from S-P |
| | G-EZ | eP | | 23 | 00 | |
| | -NEZ | eS | | 28 | 08 | Distance 31.5° |
| | -N | eL | | 31 | | |

Instrumental Constants

| | G-N | G-E | G-Z |
|---|---|---|---|
| Period of Galvanometer | 14.6 | 14.6 | 9.1 |
| Period of Pendulum | 14.1 | 14.6 | 8.9 |
| Mu square | + .02 | + .11 | +.10 |
| Synchronous Magnification | 988 | 1024 | 570 |
| Date of Test | Jan.6,1934 | Jan.5,1934 | Jan.6,1934 |

| | W-N | W-E |
|---|---|---|
| Period | 4.1 | 3.7 |
| Magnification | 63 | 73 |
| Damping | 2.6 | 1.3 |
| Friction r/T² | .015 | .023 |
| Date of Test | December 3, 1933. | |

F. W. Sohon, S.J.
Director

R. J. Buckley, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

φ = 38° 54′ 25″ N
λ = 77° 4′ 24″ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k



1934
February

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 3.61 | | 0 | 14 | 32 | 55 | Computed from PS-P' |
| | G-Z | e | | 48 | 45 | |
| | -Z | eP' | | 52 | 10 | |
| | -Z | ePS | | 64 | 21 | Distance 126° |
| | -E | iSR1 | | 71 | 07 | |
| | -Z | eL | | 92 | | |
| 12.28 | | 0 | 6 | 43 | 00 | Computed from S-P |
| | G-Z | eP | | 49 | 22 | |
| | -Z | i | | 49 | 28 | |
| | -N | iS | | 54 | 21 | Distance 29.5° |
| | -N | i | | 56 | 07 | |
| | -N | iM | | 60 | 31 | |
| 14.17 | | 0 | 4 | 00 | 00 | Computed from PS-PR1 |
| | G-Z | eP' | | 18 | 35 | |
| | -NEZ | iPR1 | | 20 | 04 | Dil from NW |
| | -NEZ | iPS | | 29 | 57 | Distance 118° |
| | -NEZ | eL | | 54 | | |
| 14.94 | G-NEZ | i | 22 | 35 | 58 | Cf. 24.04 infra |
| | -NEZ | i | | 36 | 52 | |
| | -NE | i | | 38 | 09 | |
| 19.45 | G-NZ | i | 10 | 44 | 23 | Dil from N |
| | -NZ | i | | 47 | 41 | |
| 24.04 | | 0 | 1 | 01 | 30 | Computed from S-P |
| | G-Z | eP | | 4 | 44 | |
| | -NEZ | i | | 6 | 29 | |
| | -NEZ | S | | 7 | 11 | Distance 13.6° |
| | -Z | iL | | 8 | 35 | |
| | -NEZ | iM | | 9 | 34 | Record similar to 14.94 supra |
| 24.22 | | 0 | 5 | 03 | 10 | Computed from S-P |
| | G-NZ | iP | | 39 | 00 | Com from S |
| | -NEZ | iS | | 43 | 31 | Distance 26.1° |
| | -N | eL | | 47 | | |
| 24.27 | | 0 | 6 | 23 | 40 | Computed from PS-PR1 |
| | G-Z | eP | | 38 | 07 | |
| | -NZ | ePR1 | | 42 | 30 | |
| | -EZ | iPS | | 51 | 47 | Distance 107° |
| | -NZ | eL | | 70 | | |
| 28.60 | | 0 | 14 | 25 | 50 | Computed from SR1-SKS |
| | G-Z | eP | | 40 | 47 | |
| | -EZ | eP' | | 44 | 14 | |
| | -EZ | ePR1 | | 45 | 07 | |
| | -EZ | iSKS | | 51 | 16 | |
| | -Z | eS | | 54 | 12 | Not on horizontal records. |
| | -EZ | iPS | | 55 | 02 | Distance 113° |
| | -E | iSR1 | | 61 | 12 | |
| | -E | eL | | 76 | | |

F. W. Sohon, S.J.
Director

R. J. Buckley, S.J.
Observer

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
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W = Wiechert 200k
M = Mainka 135k

1934 No. 207

| March | | | h | m | s | |
|---|---|---|---|---|---|---|
| 1.91 | | 0 | 21 | 45 | 20 | Computed from S-P |
| | G-EZ | iP | | 57 | 21 | |
| | -E | iS | | 67 | 13 | Distance 77° |
| 4.25 | | 0 | 5 | 55 | 15 | Computed from PS-PR1 |
| | G-EZ | PR1 | 6 | 15 | 18 | |
| | -NE | PS | | 25 | 08 | Distance 119° |
| | -NZ | eSR1 | | 31 | 12 | |
| | -NEZ | eL | | 50 | | |
| 5.51 | G-N | iPR1 | 12 | 07 | 15 | Instruments disturbed during quake. |
| 7.95 | | 0 | 22 | 41 | 30 | Computed from S-P |
| | G-NZ | iP | | 47 | 36 | |
| | -E | iS | | 52 | 17 | Distance 27.8° |
| | -E | i | | 52 | 33 | |
| | -NE | eL | | 55 | | |
| 12.63 | | 0 | 15 | 05 | 15 | Computed from S-P |
| | G-NEZ | iP | | 11 | 24 | Com from W |
| | -NEZ | i | | 11 | 28 | |
| | -NE | iS | | 16 | 08 | Distance 28° |
| | -NEZ | i | | 16 | 27 | |
| | W-E | eL | | 19 | 17 | |
| | -NE | iM | | 19 | 55 | |
| 12.76 | | 0 | 18 | 19 | 50 | Computed from S-P |
| | G-Z | iP | | 26 | 00 | Com |
| | W-E | eS | | 30 | 46 | Distance 28° |
| | -NE | M | | 34 | 25 | |
| 13.55 | | 0 | 13 | 12 | 00 | Computed from PS-PR1 |
| | G-Z | eP' | | 31 | 21 | |
| | -Z | PR1 | | 32 | 03 | |
| | -Z | ePS | | 41 | 58 | Distance 117° |
| | -Z | eSR1 | | 48 | 13 | |
| | -Z | eL | | 68 | | |
| 16.71 | | 0 | 16 | 59 | 10 | Computed from S-P |
| | G-Z | eP | 17 | 10 | 20 | |
| | -Z | eS | | 19 | 18 | Distance 69° |
| | -Z | eL | | 32 | | |
| 18.19 | | 0 | 4 | 33 | 20 | Distance 77° |
| | G-NEZ | iP | | 45 | 18 | Dil from SW (!) |
| | -NEZ | iPR1 | | 48 | 21 | |
| | -NE | iS | | 55 | 13 | |
| 18.81 | Peculiar disturbance on vertical during a violent wind storm. | | | | | |
| 24.50 | | 0 | 12 | 04 | 20 | Computed from SR1-P' |
| | G-Z | eP' | | 23 | 26 | |
| | -Z | PR1 | | 24 | 37 | |
| | -NEZ | iSR1 | | 41 | 41 | Distance 122° |
| | -Z | eL | | 61 | | |
| 29.84 | | 0 | 20 | 07 | 40 | Computed from S-P |
| | G-NEZ | iP | | 18 | 27 | Dil from SE |
| | -NEZ | iS | | 27 | 09 | Distance 64° |
| | -NE | eL | | 38 | | |

F. W. Sohon, S.J.
Director

R. J. Buckley, S.J.
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International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
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W = Wiechert 200k
M = Mainka 135k

1934 April — No. 208

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 3.32 | | 0 | 7 | 36 | 30 | Computed from S-P |
| | G-NEZ | eP | | 43 | 33 | |
| | -NE | iS | | 48 | 49 | Distance 33.4° |
| | -Z | eL | | 54 | | |
| 6.80 | | 0 | 19 | 09 | 45 | Computed from S-P |
| | G-Z | eP | | 22 | 53 | |
| | -Z | iPR1 | | 26 | 48 | |
| | -N | iS | | 34 | 05 | Distance 90° |
| | -NE | eL | | 56 | | |
| 9.65 | | 0 | 15 | 29 | 30 | Computed from S-P |
| | G-Z | iP | | 41 | 20 | Dil |
| | -NE | iS | | 51 | 08 | Distance 76° |
| | -N | eL | | 66 | | |
| 10.43 | | 0 | 10 | 22 | 50 | Computed from PR1-P' |
| | G-NEZ | iP' | | 42 | 39 | Com from SW |
| | -NZ | iPR1 | | 46 | 03 | Distance 150° |
| | -N | i | | 46 | 20 | |
| 11.89 | | 0 | 21 | 25 | 10 | Computed from S-P |
| | G-NEZ | eP | | 31 | 54 | |
| | -E | iS | | 37 | 12 | Distance 31.8°; e on NZ. |
| | -NEZ | eL | | 42 | | Overlapping |
| 11.93 | G-Z | i | 22 | 15 | 42 | Com |
| | -Z | eL | | 25 | | |
| 14.89 | | FELT | 21 | 28 | | in Salt Lake City (AP) |
| | G-N | eS | | 38 | 49 | Distance 28°(adopted from AP) |
| | G-Z | eL | | 39 | 57 | |

A considerable number of earthquakes similar to this have been recorded. They are charaterized by having sharply broken P-like waves with irregular period of about 5 seconds superposed on the L phase, by an exceedingly faint S phase, or none, and no sign of a true P phase. It is assumed on the basis of this report that all these otherwise unidentifiable earthquakes represent activity in the Salt Lake Region.

| | | | | | | |
|---|---|---|---|---|---|---|
| 15.13 | G-E | i | 3 | 00 | 30 | e later on NZ; felt in Vermont |
| 15.93 | | 0 | 22 | 15 | 10 | Computed from SR1-PR1 |
| | G-Z | e | | 32 | 39 | |
| | -NEZ | iP' | | 34 | 27 | Com |
| | -NEZ | iPR1 | | 36 | 52 | Com from NW |
| | -N | iSKP | | 38 | 17 | |
| | -N | ePS | | 46 | 56 | |
| | -NE | iSR1 | | 53 | 51 | Distance 130° |
| | -Z | eL | | 75 | | |
| 24.73 | | 0 | 17 | 35 | 30 | Computed from PS-PR1 |
| | G-Z | ePR1 | | 55 | 07 | |
| | -E | iSKKS | | 61 | 47 | |
| | -Z | ePS | | 64 | 47 | Distance 114° |
| | -Z | eL | | 88 | | |

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
b = − .758
c = + .628

# Washington, D. C.

# Instrumental Bulletin

**of the Georgetown University Seismological Observatory**

Spindler & Hoyer Clock corrected three times daily by NAA
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W = Wiechert 200k
M = Mainka 135k

1934 No.208 bis
April

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 26.23 | | 0 | 5 | 32 | 45 | Computed from PS--PR1 |
| | G-EZ | ePR1 | | 52 | 04 | |
| | -E | eSKS | | 57 | 39 | |
| | -E | ePS | | 61 | 32 | Distance 111° |
| | -EZ | eL | | 90 | | |
| 26.33 | | 0 | 7 | 57 | 30 | Computed from PS--PR1 |
| | G-NZ | ePR1 | 8 | 17 | o8 | |
| | -NEZ | ePS | | 26 | 50 | Distance 114° |
| | -NEZ | eL | | 54 | ca | |
| 26.87 | | 0 | 21 | 00 | 00 | Computed from PS-P' |
| | G-Z | eP' | | 19 | 01 | |
| | -Z | PR1 | | 20 | 39 | |
| | -E | iSKS | | 26 | 06 | e later on Z |
| | -NEZ | ePS | | 30 | 22 | Distance 121° |
| | -NEZ | eSR1 | | 38 | 57 | |
| | -NEZ | eL | | 58 | | |

Instrumental Constants

| | G-N | G-E | G-Z |
|---|---|---|---|
| Period of Galvanometer | 14.6 | 14.6 | 9.1 |
| Period of Pendulum | 14.1 | 14.6 | 8.9 |
| Mu square | +.02 | +.11 | +.10 |
| Synchronous Magnification | 988 | 1024 | 570 |
| Date of Test | Jan. 6,1934 | Jan 5,1934 | Jan 6, 1934 |

| Wiechert 200 Kg | W-N | W-E |
|---|---|---|
| Period | 4.1 | 3.7 |
| Magnification | 63 | 73 |
| Damping $\epsilon$ | 2.6 | 1.3 |
| Friction $r/T^2$ | .015 | .023 |
| Date of Test | December 3, 1933. | |

F. W. Sohon, S.J.
Director

R. J. Buckley, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .174
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# Washington, D. C.

# Instrumental Bulletin

of the Georgetown University Seismological Observatory

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W = Wiechert 200k
M = Mainka 135k

1934 May — No.209

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 1.29 | | 0 | 7 | 04 | 24 | Computed from PR1-P' |
| | G-Z | iP' | | 24 | 06 | Com |
| | -Z | iPR1 | | 26 | 52 | Distance 141° |
| | -Z | iSKP | | 28 | 06 | |
| 2.41 | | 0 | 9 | 45 | 15 | Computed from S-P |
| | G-EZ | eP | | 51 | 49 | |
| | -E | eS | | 56 | 49 | Distance 30° |
| | -EZ | eL | | 61 | | |
| 4.19 | | 0 | 4 | 35 | 50 | Computed from S-P |
| | G-NEZ | iP | | 44 | 42 | Dil from NW; also on W-NE |
| | -N | iS | | 51 | 29 | Distance 47.6° |
| | -EZ | i | | 51 | 38 | S? Also on W-NE |
| | W-NE | eL | | 60 | 51 | |
| 6.34 | | 0 | 8 | 09 | 25 | Computed from S-P |
| | G-Z | eP | | 15 | 33 | |
| | -N | eS | | 20 | 15 | Distance 27.9° |
| | -E | e | | 20 | 29 | |
| | -EZ | eL | | 23 | 30 | |
| 13.38 | | 0 | 9 | 02 | 50 | Computed from PS-PR1 |
| | G-Z | eP' | | 21 | 25 | |
| | -NEZ | ePR1 | | 22 | 36 | |
| | -NE | iSKKS | | 29 | 30 | |
| | -EZ | ePS | | 32 | 18 | Distance 115° |
| | -NE | iSR1 | | 39 | 15 | |
| | -Z | eL | | 59 | | |
| 14.55 | | 0 | 13 | 14 | 35 | Distance 31.8° |
| | G-Z | eP | | 21 | 21 | |
| | -N | eS | | 26 | 30 | |
| | -E | e | | 26 | 45 | |
| | -NZ | eL | | 31 | 50 | |
| 14.93 | | 0 | 22 | 12 | 40 | Computed from S-P |
| | G-NEZ | iP | | 21 | 48 | Dil from NW |
| | -NE | iS | | 28 | 58 | Distance 50° |
| 15.64 | | 0 | 15 | 20 | 20 | Computed from S-P |
| | G-NE | eP | | 27 | 06 | |
| | -E | eS | | 32 | 11 | Distance 31.2° |
| | -NEZ | eL | | 35 | | |
| 19.45 | | 0 | 10 | 47 | 20 | Computed from S-P |
| | G-NEZ | iP | | 53 | 18 | Com from SW |
| | -NEZ | iS | | 57 | 52 | Distance 27° |
| 21.42 | | 0 | 10 | 07 | 00 | Computed from S-P |
| | G-NZ | eP | | 16 | 08 | |
| | -NEZ | eS | | 23 | 18 | Distance 49.8° |
| | -NEZ | eL | | 30 | | |
| 22.46 | | 0 | 11 | 01 | 50 | Computed from S-P |
| | G-NEZ | iP | | 11 | 29 | |
| | -NE | iS | | 19 | 30 | Distance 57° |
| | -Z | eL | | 27 | 50 | |

F. W. Sohon, S.J.
Director

R. J. Buckley, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi$ = 38° 54′ 25″ N
$\lambda$ = 77° 4′ 24″ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .1742
b = − .7584
c = + .6280

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1934 No.210

| June | | | h | m | s | |
|---|---|---|---|---|---|---|
| 2.25 | | 0 | 5 | 54 | 00 | Computed from PS-SKS |
| | G-N | iSKS | 6 | 19 | 39 | |
| | -NZ | iPS | | 23 | 34 | Distance 115° |
| | -NE | eSRl | | 29 | 55 | |
| | -E | eL | | 44 | | |
| 2.57 | | 0 | 13 | 42 | 20 | Computed from S-P |
| | G-NEZ | iP | | 50 | 36 | |
| | -NE | iS | | 57 | 00 | Distance 43° |
| | -Z | eL | | 63 | 30 | |
| 2.70 | | 0 | 16 | 44 | 55 | Computed from S-P |
| | G-NZ | iP | | 54 | 03 | |
| | -Z | S | | 61 | 16 | Distance 50° |
| | -NZ | eL | | 68 | | |
| 8.20 | G-NEZ | eL | 4 | 48 | 32 | |
| | -EZ | i | | 51 | 42 | |
| | -E | i | | 60 | 25 | Also e on NZ |
| | -EZ | i | | 63 | 24 | |
| | -N | e | | 63 | 47 | |
| | -EZ | i | | 65 | 54 | |
| 9.54 | | 0 | 12 | 58 | 25 | Computed from PS-P' |
| | G-Z | iP' | 13 | 17 | 40 | Com |
| | -NEZ | iPRl | | 19 | 43 | Com from NW |
| | -E | iPS | | 30 | 18 | Distance 129° |
| | -Z | eL | | 61 | | |
| 12.40 | | 0 | 9 | 32 | 00 | Computed from S-P |
| 12.40 | G-NEZ | eP | | 38 | 26 | |
| | -NE | eS | | 43 | 17 | Distance 29.2° |
| | -NE | eL | | 47 | 12 | |
| 13.08 | | 0 | 1 | 57 | 10 | Computed from S-P |
| | G-NZ | iP | 2 | 03 | 37 | Dil from N |
| | -N | iS | | 14 | 06 | Distance 83° |
| | -Z | eL | | 29 | | |
| 13.92 | G-N | iSRl | 22 | 43 | 06 | Beginning lost |
| 15.27 | | 0 | 6 | 34 | 15 | Computed from S-P |
| | G-NZ | eP | | 39 | 56 | |
| | -NE | eS | | 44 | 21 | Distance 25.4° |
| | -NZ | eL | | 46 | 20 | |
| 18.38 | | 0 | 9 | 13 | 40 | From S-P. No minute marks |
| | G-NEZ | iP | | 22 | 35 | Measurements from NAA time signals. |
| | -NEZ | S | | 29 | 33 | Distance 48° |
| 22.77 | | 0 | 18 | 33 | 40 | Computed from S-P |
| | G-NEZ | eP | | 40 | 18 | |
| | -NE | eS | | 45 | 20 | Distance 30.8° |
| | -NZ | eL | | 49 | 30 | |
| 23.07 | | 0 | 1 | 39 | 40 | Computed from S-P |
| | G-Z | eP | | 48 | 48 | |
| | -NE | eS | | 56 | 01 | Distance 50° |
| | -NE | eL | | 65 | | |

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38° 54' 25''$ N
$\lambda = 77° 4' 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .1742
b = − .7584
c = + .6280

# Washington, D.C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1934 No.210bis
June

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 24.25 | | 0 | 5 | 59 | 30 | Computed from S-P |
| | G-NEZ | iP | 6 | 09 | 45 | Dil from S |
| | -NZ | i | | 10 | 11 | |
| | -E | iS | | 18 | 03 | Distance 60° |
| | -E | eL | | 28 | 30 | |
| 29.36 | W-NE | i | 8 | 43 | 36 | |
| 29.52 | | 0 | 12 | 33 | 30 | Computed from PR1-P' |
| | G-NEZ | iP' | | 53 | 08 | Dil from NW |
| | -Z | iPR1 | | 55 | 46 | Distance 139° |
| | -NE | iSKP | | 56 | 49 | |
| | -NE | ePS | | 67 | 25 | |
| | -NE | eSR1 | | 74 | | |

### Instrumental Constants

| | G-N | G-E | G-Z |
|---|---|---|---|
| Period of Galvanometer | 14.6 | 14.6 | 9.1 |
| Period of Pendulum | 14.1 | 14.6 | 8.9 |
| Mu square | +.02 | +.11 | +.10 |
| Synchronous Magnification | 988 | 1024 | 570 |
| Date of Test | Jan.6,1934 | Jan.5,1934 | Jan.6,1934 |

Constants of 200 Kg Wiechert December 3, 1933

| Component | W-N | W-E |
|---|---|---|
| Period | 4.1 sec | 3.7 sec |
| Magnification | 63 | 73 |
| Damping | 2.6 | 1.3 |
| Friction | .015 | .023 mm/sec$^2$ |

F. W. Sohon, S.J.
Director

R. J. Buckley, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi$ = 38° 54′ 25″ N
$\lambda$ = 77° 4′ 24″ W,
h = 42.4 m
Sub-Soil, Decayed Diorite,
a = + .1742
b = − .7584
c = + .6280

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# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1934 No.211

| July | | | h | m | s | |
|---|---|---|---|---|---|---|
| 4.07 | | 0 | 1 | 42 | 35 | Computed from PS-PR1 |
| | G-EZ | ePR1 | 2 | 00 | 14 | |
| | -NE | SKS | | 07 | 04 | |
| | -NE | PS | | 09 | 14 | Distance 99° |
| | -NEZ | eL | | 31 | | |
| 6.95 | | 0 | 22 | 48 | 30 | Computed from S-P |
| | G-NEZ | iP | | 56 | 05 | Com from SW |
| | -NE | iS | | 61 | 53 | Distance 37.4° |
| 10.04 | | 0 | 1 | 01 | 40 | Computed from S-P |
| | G-NZ | eP | | 06 | 40 | |
| | -NEZ | S | | 10 | 25 | Distance 21.2° |
| | -NEZ | eL | | 13 | | |
| 16.35 | | 0 | 8 | 18 | 30 | Computed from S-P |
| | G-NEZ | iP | | 25 | 11 | |
| | -NE | iS | | 30 | 15 | Distance 31.0° |
| | -NE | eL | | 36 | | |
| 18.07 | | 0 | 1 | 35 | 53 | Computed from S-P |
| | G-NEZ | iP | | 42 | 44 | Com from SW |
| | -E | S | | 47 | 57 | Distance 32.2° |
| | | L | Tangled | | | |
| 18.67 | | 0 | 16 | 09 | 30 | Computed from S-P |
| | G-N | P | | 16 | 11 | |
| | -NE | S | | 21 | 16 | Distance 31.2° |
| | -Z | eL | | 25 | | |
| 18.71 | | 0 | 16 | 58 | 55 | Computed from S-P |
| | G-NEZ | iP | 17 | 06 | 04 | Com from SW |
| | -N | i | | 11 | 16 | |
| | -EZ | iS | | 11 | 28 | Distance 34.2° |
| 18.82 | | 0 | 19 | 40 | 10 | Computed from PS-P' |
| | G-Z | e | | 55 | 26 | |
| | -NEZ | iP' | | 59 | 07 | |
| | -EZ | PS | | 70 | 05 | Distance 117° |
| | -Z | eL | | 96 | | |
| 19.07 | | 0 | 1 | 34 | 00 | Distance 85° |
| | G-Z | iP | | 46 | 46 | |
| | -E | iS | | 59 | 26 | |
| | -Z | eL | | 81 | | |
| 19.33 | | 0 | 7 | 50 | 10 | Computed from S-P |
| | G-Z | e | | 55 | 56 | |
| | -NE | iP | 8 | 02 | 36 | |
| | -NE | ePR1 | | 06 | 40 | |
| | -NE | eS | | 13 | 03 | Distance 83° |
| | -EZ | eL | | 30 | | |

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38° 54' 25''$ N
$\lambda = 77° 4' 24''$ W,
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .1742
b = − .7584
c = + .6280

# Washington, D.C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1934 August — No.212

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 2.30 | | 0 | 7 | 13 | 00 | From S-P |
| | G-NEZ | eP | | 21 | 47 | |
| | -NE | iS | | 28 | 43 | Distance 47.4° |
| | -NEZ | eL | | 34 | | |
| 6.51 | | 0 | 12 | 07 | 00 | From S-P |
| | G-NZ | iP | | 14 | 12 | D from N |
| | -NE | iS | | 19 | 43 | Distance 34.8° |
| | -NE | eL | | 24 | | |
| 7.15 | | 0 | 3 | 40 | 00 | From PS-PRl |
| | G-Z | ePRl | 4 | 00 | 13 | NE later |
| | -N | iPS | | 10 | 23 | Distance 120° |
| | -EZ | eL | | 36 | | |
| 12.99 | | 0 | 23 | 49 | 45 | From PS-PRl |
| | G-Z | eP' | 24 | 08 | 38 | |
| | -Z | iPRl | | 10 | 29 | |
| | -N | iPS | | 20 | 42 | Distance 125° |
| | -Z | eL | | 52 | | |
| 15.46 | | 0 | 11 | 03 | 45 | From S-P |
| | G-NEZ | eP | | 10 | 10 | |
| | -NEZ | i | | 10 | 48 | C from NW |
| | -NEZ | iS | | 15 | 02 | Distance 29.4° |
| | -NEZ | eL | | 18 | | |
| 20.04 | G-EZ | e | 0 | 52 | 15 | |
| | -NZ | i | | 52 | 24 | |
| | -NEZ | i | | 53 | 18 | |
| 26.06 | | 0 | 1 | 30 | 40 | From S-P |
| | G-E | eP | | 37 | 28 | Z 37:47 |
| | -NE | iS | | 42 | 51 | Distance 32.3° |
| | -NEZ | eL | | 46 | | |
| 28.47 | | 0 | 11 | 23 | 05 | From S-P |
| | G-EZ | eP | | 29 | 40 | |
| | -E | eS | | 34 | 40 | Distance 30.4° |
| | -EZ | eL | | 42 | | |
| 31.21 | | 0 | 5 | 02 | 30 | From S-P |
| | G-NZ | iP | | 09 | 35 | C from N |
| | -EZ | iS | | 14 | 58 | Distance 33.7° |
| | -NEZ | eL | | 19 | | |

F. W. Sohon, S.J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W
$h = 42.4$ m
Sub-Soil, Decayed Diorite
$a = +.174$
$b = -.758$
$c = +.628$

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

No.213

1934
September

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 15.29 | | 0 | 6 | 56 | 50 | From S-P |
| | G-NZ | iP | 7 | 3 | 04 | No East record |
| | -N | e | | 6 | 57 | |
| | -N | e | | 7 | 30 | |
| | -N | eS | | 7 | 47 | Distance 26.3° |
| | -N | e | | 10 | 02 | |
| | -NZ | M | | 13 | 47 | |

No.214

1934
October

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 10.65 | | 0 | 15 | 41 | 55 | From SR1-PR1 |
| | G-NEZ | iPR1 | | 59 | 54 | |
| | -E | iSKS | | 66 | 59 | |
| | -NEZ | iSKKS | | 67 | 49 | |
| | -NZ | ePS | | 69 | 42 | |
| | -N | iSR1 | | 76 | 11 | Distance 108° |
| 26.61 | | 0 | 14 | 43 | 20 | From PR1-P' |
| | G-NEZ | iP' | 15 | 2 | 53 | Dil from NW |
| | -NZ | ePR1 | | 5 | 16 | Distance 137° |
| | -NE | iSKP | | 6 | 36 | |
| | -N | iSKS | | 8 | 59 | |

Constants of the Galitzin Instruments

| | $T_1$ sec | T sec | $mu^2$ | $\frac{k A_1}{2n_1 \ell}$ | Date of Test |
|---|---|---|---|---|---|
| G-N | 14.55 | 14.05 | +.06 | 1027 | Aug 10, 1934 |
| G-E | 14.59 | 15.46 | +.02 | 1150 | Aug 10, 1934 |
| G-Z | 9.08 | 9.10 | much under | 940 | Aug 10, 1934 |

Constants of the 200 Kg Wiechert

| | T | V | $\epsilon$ | $r/T^2$ | Date of Test |
|---|---|---|---|---|---|
| W-N | 4.1 | 63 | 2.6 | .015 | Dec 3, 1933 |
| W-E | 3.7 | 73 | 1.3 | .023 | Dec 3, 1933 |

N.B. The synchronous magnification of the Galitzin instruments will hereafter be given as

$$\frac{k A_1}{2n_1 \ell} = \frac{k A_1 T_1}{4 \pi \ell}$$

F. W. Sohon, S.J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi$ = 38° 54′ 25″ N
$\lambda$ = 77° 4′ 24″ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .1742
b = − .7584
c = + .6280

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

No. 215

1934
November

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 5.96 | | 0 | 23 | 03 | 25 | From S-P |
| | G-NEZ | iP | | 14 | 05 | Com from NW |
| | -EZ | iS | | 22 | 45 | Distance 64° |
| | -NEZ | eL | | 34 | | |
| 27.26 | | 0 | 6 | 13 | 55 | From PR1-P' |
| | G-Z | eP' | | 33 | 26 | |
| | -NEZ | iPR1 | | 35 | 52 | Distance 136° |
| | -NE | iSKP | | 37 | 26 | |
| | -NE | iSKS | | 40 | 28 | |
| | -E | iSR1 | | 54 | 07 | |
| | -NZ | eL | | 81 | | |
| 30.09 | | 0 | 2 | 04 | 35 | From S-P |
| | G-NEZ | eP | | 11 | 35 | |
| | -NEZ | iPR1 | | 12 | 34 | Com from SW |
| | -NEZ | eS | | 16 | 56 | Distance 33.5° |
| | | L tangled | | | | |

Constants of the Galitzin Instruments

| | $T_1$ sec | T sec | $mu^2$ | $\frac{kA_1}{2n_1\ell}$ | Date of Test |
|---|---|---|---|---|---|
| G-N | 14.55 | 14.05 | +.06 | 1027 | Aug 10, 1934 |
| G-E | 14.59 | 15.46 | +.02 | 1150 | Aug 10, 1934 |
| G-Z | 9.08 | 9.10 | much under | 940 | Aug 10, 1934 |

Constants of the 200 Kg Wiechert

| | T | V | $\frac{1}{2}$ | $r/T^2$ | |
|---|---|---|---|---|---|
| W-N | 4.2 | 99 | 1.23 | .020 | November 23, 1934 |
| W-E | 3.2 | 122 | 1.13 | .059 | |

F. W. Sohon, S.J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi$ = 38° 54′ 25″ N
$\lambda$ = 77° 4′ 24″ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .1742
b = − .7584
c = + .6280

# Washington, D.C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1934 No.216
December

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 3.07 | | 0 | 1 | 45 | 15 | From S-P |
| | G-NEZ | iP | | 41 | 12 | Dil from SW |
| | -E | S | | 45 | 45 | Distance 26.7°; 45:57 on G-N |
| | -NEZ | eL | | 50 | | |
| 3.11 | | 0 | 2 | 38 | 05 | From S-P |
| | G-NEZ | iP | | 44 | 06 | Dil from S |
| | -Z | iPRl | | 44 | 51 | |
| | -NEZ | iS | | 48 | 41 | Distance 26.5° |
| | -NZ | eL | | 52 | | |
| 4.73 | | 0 | 17 | 24 | 25 | From S-P |
| | G-NZ | iP | | 34 | 27 | Com from S |
| | -E | iS | | 42 | 24 | Distance 58° |
| | -NEZ | eL | | 53 | | |
| 15.08 | | 0 | 1 | 57 | 30 | From PS-PRl |
| | G-Z | ePRl | | 16 | 41 | G-E out of balance |
| | -N | PS | | 26 | 02 | Distance 109° |
| | -Z | PPS | | 27 | 01 | |
| | -N | SRl | | 31 | 16 | |
| | -N | eL | | 49 | | |
| 22.60 | | 0 | 14 | 29 | 40 | From S-P |
| | G-NZ | iP | | 35 | 34 | Com from S |
| | -NEZ | iS | | 40 | 49 | Distance 32.4° |
| | -NEZ | eL | | 44 | | |
| 23.41 | | 0 | 9 | 52 | 20 | From S-P |
| | G-NZ | eP | 10 | 02 | 27 | |
| | -NEZ | S | | 10 | 37 | Distance 59° |
| | -NE | PS | | 11 | 19 | |
| | -NE | SRl | | 15 | 20 | |
| | -NEZ | eL | | 22 | | |
| 30.58 | | 0 | 13 | 52 | 04 | From S-P |
| | G-NEZ | eP | | 58 | 43 | Heavy micros |
| | -N | iS | | 63 | 48 | Distance 35° |
| | | L not legible; other impulses. | | | | |
| 31.78 | | 0 | 18 | 45 | 40 | From S-P |
| | G-NEZ | iP | | 52 | 22 | Com from SW |
| | -E | iS | | 57 | 30 | Distance 31.4° |
| | | L not legible. | | | | |

Constants of the Galitzin Instruments

| | $T_1$ sec | T sec | $mu^2$ | $\frac{kA_1}{2n_1}$ | Date of Test |
|---|---|---|---|---|---|
| G-N | 14.55 | 14.05 | +.06 | 1027 | Aug 10, 1934 |
| G-E | 14.59 | 15.46 | +.02 | 1150 | Aug 10, 1934 |
| G-Z | 9.08 | 9.10 | much under | 940 | Aug 10, 1934 |

F. W. Sohon, S.J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi$ = 38° 54′ 25″ N
$\lambda$ = 77° 4′ 24″ W,
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .1742
b = − .7584
c = + .6280

# Washington, D.C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1935 No.217
January

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 1.56 | | 0 | 13 | 21 | 10 | From PS-P |
| | G-NE | iP | | 35 | 15 | Difficult on account of heavy micros |
| | -E | iPR1 | | 39 | 07 | |
| | -E | i | | 44 | 54 | Strong impulse |
| | -E | iSKS | | 45 | 47 | |
| | -N | iSKKS | | 46 | 19 | |
| | -E | i | | 47 | 05 | Strong impulse |
| | -NE | iPS | | 48 | 28 | Distance 103° |
| 2.95 | | 0 | 22 | 41 | 00 | From S-P |
| | G-EZ | iP | | 48 | 13 | D from E |
| | -N | eS | | 53 | 44 | Distance 35° |
| | -NEZ | eL | | 58 | | |
| 3.08 | | 0 | 1 | 49 | 40 | From PS-PR1 |
| | G-NZ | iPR1 | 2 | 09 | 10 | |
| | -NE | ePS | | 18 | 37 | Distance 112° |
| | -NE | SR1 | | 24 | 14 | |
| | -NEZ | eL | | 39 | | |
| 4.61 | | 0 | 14 | 41 | 55 | From S-P |
| | G-Z | iP | | 53 | 27 | |
| | -NE | iS | | 63 | 01 | Distance 73° |
| | -NE | iSR1 | | 67 | 38 | |
| | -NEZ | eL | | 76 | | |
| 4.68 | | 0 | 16 | 20 | 15 | From S-P |
| | G-EZ | iP | | 31 | 50 | C |
| | -N | S | | 41 | 18 | Distance 73° |
| | -NZ | eL | | 56 | | |
| 23.31 | | 0 | 7 | 24 | 00 | From S-P |
| | G-NEZ | eP | | 34 | 20 | C from NW |
| | -E | PR1 | | 36 | 41 | |
| | -NEZ | iS | | 42 | 38 | Distance 61° |
| | -Z | eL | | 52 | | |

Constants of the Galitzin Instruments

| | $T_1$ sec | T sec | $mu^2$ | $\frac{kA_1}{2n_1 I}$ | Date of Test |
|---|---|---|---|---|---|
| G-N | 14.55 | 14.05 | +.06 | 1027 | August 10, 1934 |
| G-E | 14.59 | 15.46 | +.02 | 1150 | August 10, 1934 |
| G-Z | 9.08 | 9.10 | much under | 940 | August 10, 1934 |

F. W. Sohon, S.J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi$ = 38° 54′ 25″ N
$\lambda$ = 77° 4′ 24″ W,
h = 42.4 m
Sub-Soil, Decayed Diorite,
a = + .1742
b = − .7584
c = + .6280

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1935 No.218
February

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 6.08 | | 0 | 1 | 53 | 23 | From S-P |
| | G-EZ | P | 2 | 00 | 06 | |
| | -NE | S | | 05 | 13 | Distance 31.5° |
| | -NEZ | eL | | 07 | ca | |
| 13.72 | | 0 | 17 | 22 | 05 | From S-P |
| | G-NZ | iP | | 32 | 28 | e on E 32:25? |
| | -NEZ | S | | 40 | 56 | Distance 63° |
| | -Z | eL | | 52 | | |
| 20.47 | | 0 | 11 | 22 | 05 | From S-P |
| | G-Z | eP | | 30 | 53 | |
| | -NZ | ePRl | | 32 | 49 | |
| | -NEZ | eS | | 37 | 46 | Distance 47.6° |
| | -NZ | eL | | 45 | ca | |
| 22.71 | | 0 | 17 | 06 | 00 | From S-P |
| | G-NZ | eP | | 17 | 02 | |
| | -NZ | iPcP | | 17 | 27 | |
| | -NZ | iPRl | | 20 | 00 | Many unidentified impulses |
| | -N | iS | | 26 | 06 | Distance 68° |
| | -Z | iPS | | 26 | 38 | |
| | | L not legible | | | | |
| 25.12 | | 0 | 2 | 51 | 35 | From S-P |
| | G-NEZ | eP | 3 | 03 | 13 | |
| | -NEZ | iPcP | | 03 | 43 | |
| | -E | iPRl | | 06 | 19 | |
| | -NEZ | iS | | 12 | 51 | Distance 74° |
| | -NE | iSRl | | 17 | 30 | |
| | -NZ | eL | | 24 to 27 | | |

Constants of the Galitzin Instruments

| | $T_1$ sec | T sec | $mu^2$ | $\frac{kA_1}{2n_1}$ | Date of Test |
|---|---|---|---|---|---|
| G-N | 14.55 | 14.05 | +.06 | 1027 | August 10, 1934 |
| G-E | 14.59 | 15.46 | +.02 | 1150 | August 10, 1934 |
| G-Z | 9.08 | 9.10 | much under | 940 | August 10, 1934 |

F. W. Sohon, S.J.
Director

L. C. McHugh, S.J.
Observer.

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38^\circ\ 54'\ 25''$ N
$\lambda = 77^\circ\ 4'\ 24''$ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .1742
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c = + .6280

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1935 March — No. 219

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 17.90 | | 0 | 21 | 33 | 21 | From $\frac{1}{2}$(S+sS) - $\frac{1}{2}$(P+pP) |
| | G-NZ | iP | | 39 | 00 | C from S |
| | -Z | ipP | | 39 | 29 | (P+pP)/2 = 39:15 |
| | -NEZ | S | | 43 | 34 | Distance 28.0° |
| | -NZ | isS | | 44 | 37 | (S+sS)/2 = 44:05 |
| 30.89 | | 0 | 21 | 19 | 30 | From PRL-P |
| | G-NEZ | eP | | 33 | 07 | |
| | -NEZ | ePRl | | 37 | 01 | Distance 95° |
| | -NE | iSKS | | 43 | 17 | |
| | -NZ | S | | 43 | 25 | |
| | -NE | iPS | | 45 | 46 | |
| | -NEZ | eL | | 67 | | |

1935 April — No. 220

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 10.94 | | 0 | 22 | 32 | 10 | From S-P |
| | G-NEZ | iP | | 38 | 45 | C from SW |
| | -NEZ | S | | 43 | 47 | Distance 30.7° |
| | -NEZ | eL | | 48 | | |
| 11.97 | | 0 | 23 | 14 | 31 | From PS-P |
| | G-Z | iP | | 27 | 58 | Dil |
| | -N | iPRl | | 33 | 45 | |
| | -NE | iSKS | | 38 | 28 | |
| | -NE | ePS | | 40 | 12 | Distance 94° |
| | -NEZ | eL | | 57 | | |
| 19.64 | | 0 | 15 | 23 | 30 | From S-P |
| | G-NEZ | iP | | 34 | 57 | Dil from NW ! |
| | -NEZ | iS | | 44 | 19 | Distance 72° |
| | -NZ | eL | | 56 | | |
| 20.22 | | 0 | 5 | 11 | 00 | From S-P |
| | G-NE | eP | | 22 | 25 | |
| | -NE | i | | 22 | 34 | |
| | -NE | iS | | 31 | 52 | Distance 72° |
| | -NE | eL | | 44 | | |
| 20.92 | | 0 | 22 | 03 | 09 | From SKS-eP' |
| | G-NE | eP' | | 21 | 48 | |
| | -NE | iSKS | | 28 | 39 | Distance 115° |
| | -E | eSR2 | | 43 | 18 | |
| | -E | eL | | 53 | | |

F. W. Sohon, S.J.
Director

L. C. McHugh, S.J.
Observer

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi = 38°\ 54'\ 25''$ N
$\lambda = 77°\ 4'\ 24''$ W,
h = 42.4 m
Sub-Soil, Decayed Diorite,
a = + .1742
b = − .7584
c = + .6280

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

No. 221

1935
May

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 1.43 | | 0 | 10 | 24 | 22 | From SR1-S |
| | G-E | eP | | 37 | 10 | No vertical record |
| | -NE | iS | | 47 | 35 | |
| | -E | eSR1 | | 53 | 10 | Distance 84° |
| | -NE | eL | | 64 | | |
| 14.97 | | 0 | 23 | 23 | 00 | From PS-PR1 |
| | G-Z | e | | 37 | 22 | |
| | -N | eP' | | 40 | 25 | |
| | -NZ | ePR1 | | 41 | 32 | |
| | -NE | iSKS | | 47 | 35 | |
| | -NZ | iPS | | 50 | 36 | Distance 104° |
| | -NEZ | eL | | 65 | | |
| 18.74 | | 0 | 17 | 42 | 12 | From S-P |
| | G-NE | eP | | 45 | 50 | But G-Z e 46:04 |
| | -NEZ | eS | | 49 | 02 | Distance 16° |
| | | L difficult. Horizontals disturbed by wind. | | | | |
| 21.39 | | 0 | 6 | 59 | 40 | From PS-P |
| | G-NZ | eP | | 12 | 51 | |
| | -E | eSKS | | 22 | 46 | |
| | -NEZ | ePS | | 24 | 53 | Distance 91° |
| | -NE | eSR1 | | 30 | 25 | |
| | -NEZ | eL | | 50 | | Identifications weak |
| 23.75 | | 0 | 17 | 58 | 50 | From S-P |
| | G-Z | iP | 18 | 05 | 28 | Com |
| | -EZ | ePR1 | | 06 | 16 | |
| | -E | eS | | 10 | 30 | Distance 30.8° |
| | -NEZ | eL | | 14 | | |
| 24.23 | | 0 | 5 | 36 | 50 | PS-PR1 |
| | G-Z | eP' | | 55 | 32 | |
| | -NEZ | ePR1 | | 57 | 26 | |
| | -NE | ePS | | 67 | 43 | Distance 123° |
| | -NEZ | eSR1 | | 74 | 08 | |
| | | L not legible | | | | |
| 30.90 | | 0 | 21 | 32 | 55 | Distance 102° |
| | G-Z | e | | 46 | 59 | |
| | -NEZ | ePR1 | | 51 | 14 | |
| | -E | ePS | | 60 | 11 | |
| | -NEZ | SR1 | | 66 | 29 | |
| | -Z | eL | | 82 | | |

When iP occurs on all three components the trace amplitudes will be given.

Constants of the Galitzin Instruments

| | $T_1$ sec | T sec | $mu^2$ | $\frac{kA_1}{2n_1}$ | Date of Test |
|---|---|---|---|---|---|
| G-N | 14.55 | 14.05 | +.06 | 1027 | August 10, 1934 |
| G-E | 14.59 | 15.46 | +.02 | 1150 | August 10, 1934 |
| G-Z | 9.08 | 9.10 | much under | 940 | August 10, 1934 |

F. W. Sohon, S.J.
Director

L. C. McHugh, S.J.
Observer

International Seismological Centre From the ISC collection scanned by SISMOS

$\phi$ = 38° 54′ 25″ N
$\lambda$ = 77° 4′ 24″ W
h = 42.4 m
Sub-Soil, Decayed Diorite
a = + .1742
b = − .7584
c = + .6280

# Washington, D. C.

# Instrumental Bulletin

## of the Georgetown University Seismological Observatory

Spindler & Hoyer Clock corrected three times daily by NAA
G = Galitzin (Cambridge Instrument Co.)
W = Wiechert 200k
M = Mainka 135k

1935 No.222
June

| | | | h | m | s | |
|---|---|---|---|---|---|---|
| 11.91 | | 0 | 21 | 55 | 45 | From S-P |
| | G-NZ | eP | 22 | 02 | 57 | |
| | -NE | eS | | 08 | 26 | Distance 34.4° |
| | -NEZ | eL | | 12 | | |
| 24.97 | | 0 | 23 | 22 | 35 | From PS-PR1 |
| | G-EZ | iPR1 | | 42 | 42 | |
| | -E | iSKKS | | 49 | 39 | |
| | -NE | i | | 50 | 59 | |
| | -E | iPS | | 52 | 39 | Distance 117°; i 52:59 on G-N |
| | -Z | iPPS | | 53 | 45 | Strongest phase on all components |
| | -EZ | SR1 | | 59 | 22 | |
| | -Z | eL | | 79 | | |
| 25.52 | | 0 | 12 | 34 | 00 | From S-P |
| | G-NEZ | eP | | 46 | 15 | |
| | -N | eS | | 56 | 25 | Distance 80°; e 56:33 on G-E |
| | -NE | eL | | 73 | | |
| 28.08 | | 0 | 2 | 00 | 30 | From S-P |
| | G-NZ | iP | | 12 | 08 | Trace amplitudes: 1.2 N, 1.4 C |
| | -NZ | iS | | 21 | 43 | Distance 74° |
| | -N | eL | | 35 | | (G-E disturbed by spider?) |
| 29.28 | | 0 | 6 | 48 | 07 | From S-P |
| | G-NEZ | iP | | 55 | 09 | Trace amplitudes: 1.6 N, 2.0 E, 1.6 C |
| | -NE | iS | | 60 | 29 | Distance 33.3° |
| | | L difficult | | | | |

Trace amplitudes of iP will be given in mm and marked N,S,E,W,C = up, D = down, according to the direction of earth thrust.

At the Ottawa meeting it was suggested that ordinary travel time curves might be used for deep focus earthquakes, if $\frac{1}{2}$(P + pP) were taken instead of P, and if $\frac{1}{2}$(S + sS) were taken for S. Taking Wadati's travel times as published in the Geophysical Magazine Vol VII, No.1, pages 280, 281, 285 and 288, the arithmetic mean was found to differ from the arrival time corresponding to zero depth by more than one second only in the following cases:

320 Km at 26°, $\frac{1}{2}$(P + pP) is 1.5 sec early
500 Km " 32° " 1.5 "
" 34° and 36° 2.5 "
160 and 240 Km at 24°, $\frac{1}{2}$(S + sS) is 1.5 sec early
320 Km.: at 24°, 3.5 sec; at 26° and 28°, 2.5 sec early for $\frac{1}{2}$(S + sS)
400 Km.: at 28°, 3.5 sec early; at 30°,1.5 sec early; at 32°,2.5 sec late
500 Km.: at 32°, 2.5; at 34°,1.5; at 36°,2.0; at38°,1.5 sec early.

The method would therefore seem to give a very good approximation.

F. W. Sohon,S.J.
Director.

International Seismological Centre From the ISC collection scanned by SISMOS

SEISMOLOGICAL DESPATCHES

GEORGETOWN UNIVERSITY
WASHINGTON, D. C.

By courtesy of the Associated Press

Ramal Hal, Portugal, May 1 - Slight earth shocks were felt here this morning.

San Salvadore, Republic of Salvador, May 1 - Earth tremors were felt here yesterday. The population was alarmed but no casualties were reported.

Tokyo, May 1 - An earthquake of unusual strength and duration, shaking Tokyo shortly after midnight, did no great damage. There were no reports of casualties.

The tremor's epicenter was reckoned as probably at sea, 75 miles north of Tokyo. At 12.58 A.M. residents felt it for a full five minutes.

Scientists attributed the disturbance to activity in the "Outer Miuscartra earthquake belt."

Buenos Aires, May 5 - Severe earthquake shocks were felt at 8:20 A.M. today in the Province of Mendoza. Their epicenter was placed in the Andes. No casualties or damage were reported.

Rangoon, Burma, May 6 - The ancient seaport of Pegu, one of the most important in British India, lay desolate tonight from an earthquake and tidal wave that overwhelmed it during the night. It was estimated that between 400 and 1000 persons had perished. Southern Burma suffered in the disaster.

Fire following the earthquake and the tidal wave destroyed what few vestiges of habitations were left in this Pegu whose history goes back to 537 A.D.

The immense tidal wave overwhelmed the city without time for warning; dead and wounded were still being taken from the ruins tonight, and a makeshift hospital camp was giving first aid.

Broken communications and disorganization of public services made accurate information meagre. Few buildings escaped damage. Even the roof of the famous Shwe-Maw-Daw Pagoda, an ancient temple rising to a height of 324 feet, was wrecked. The pagoda is one of the holiest places in all Burma.

Virtually the entire population of Pegu, normally about 18,769, was homeless and shelterless tonight. The municipal building, the banks, the government school, the police commissioner's office and the market were destroyed. The fire still smouldered in the evening.

Great numbers of natives were buried in the collapse of a motion picture theatre, overwhelmed while the show was going on. A rice mill was engulfed completely. All rail communication beyond the town was halted because of the collapse of a bridge two miles north of Pegu.

Rangoon, Burma, May 7 - A check of casualties in the District of Southern Burma devastated by an earthquake and a tidal wave on Monday, today gave 400 dead and hundreds injured at the Seaport of Pegu and 200 dead or injured at Rangoon.

In the large centers the death totals rose slowly, but fell far short of earlier estimates that between 5000 and 7000 persons had perished. Many outlying sections could not be reached at all, however.

Though the greatest damage in the Pegu division, which includes the city of Rangoon, was at Pegu itself, Rangoon suffered terribly in the earthquake. Many buildings in the European residential quarter collapsed and the high court buildings were badly damaged. The inhabitants, fearing further shocks, fled to the streets and remained out of doors. The offices of the Rangoon Times were badly damaged.

The earthquake was one of the worst ever known in a district that has frequently suffered from them. Scarcely a building in the city escaped damage and many collapsed entirely. Towns near Rangoon and Pegu were badly shaken and communications were cut, so that casualties elsewhere could not be verified. One report said that Thomgwa Island, in the Hanthawaddy District had disappeared entirely.

Beirut, Syria, May 8 - A strong seismic disturbance about 150 miles north of the city was recorded here today. No damage was reported and it was believed likely that it was a submarine earthquake.

Teheran, Persia, May 9 - The newspaper Iran said today that there was an earthquake Monday at Salmasg. Many buildings were damaged and the bulk of the population camped outside the city during the remainder of the night, when a second and more severe shock occurred. Most of the buildings in the town collapsed during the second shock, burying those who had remained.

Teheran, Persia, May 10 - Late reports trickling in here from Azerbaijan show that the earthquakes reported the last few days have done terrific damage, 2000 being reported killed and 5000 injured in the Salmas District. The town of Salmas itself was almost destroyed, reliable dispatches say.

Many tremors were felt in Tabriz, culminating yesterday in a severe earth shock which lasted a minute and a half.

International Seismological Centre From the ISC collection scanned by SISMOS

# SEISMOLOGICAL DESPATCHES

GEORGETOWN UNIVERSITY
WASHINGTON, D. C.

## J U N E - 1 9 3 0

Through courtesy of the Manila Observatory. Belated dispatches for May, 1930:
May 20 - Earthquake at 15:05 G.M.T. about 660 km north of Manila. Felt at Basco in the Batan Islands with intensity VI.
May 28 - Earthquake felt with intensity IV at Aparri, Northern Luzon, Philippine Islands, at 12:30 G.M.T. May 27, 1930.
Through courtesy of the Associated Press:
Tokyo, June 11 - A heavy fall of ashes and stones from Asama Volsa No, 90 miles to the northwest, was reported today from the villages to the northward of Karuizawa, and considerable damage was feared.

The lava started fires in the forests on the lower slopes of the mountains which were still burning late today.

Considerable falls of ash were reported in Takasaki and other towns up to a radius of 30 miles from the volcano.

Guatemala, June 14 - Earthquakes of considerable intensity, preceded by alarming noises, were reported tonight to be continuing in Santa Rosa Province. The government has sent a group of experts to the volcanoes, known at Tecuamburro and Jumay, to determine whether they show signs of activity, and if they do, to recommend what precautionary measures should be taken.
Teheran, Persia, June 15 - A severe earthquake shock was felt on the Plain of Salmas yesterday. The tremors also were felt at Tabriz.
Guatemala City, June 21 - The mountainous Santa Rosa Province country has been shaking slightly at rather frequent intervals for the last ten days. Many of the inhabitants, fearing there will be a violent earthquake, have left their homes.
Athens, June 21 - In the past few days a number of houses at the town of Canea collapsed under strong earth shocks. No casualties were reported.
Lima, Ohio, June 26 - A slight earth tremor was reported here at 3:55 p.m. today. It lasted only a few seconds.
Lima, Peru, June 26 - The National Telegraph Lines today said that strong earthquake shocks were felt Wednesday at 5:30 a.m. and 4:30 p.m. at Ica. They were of long duration and damaged many walls. The inhabitants were panic stricken, and left their dwellings to take refuge in the streets and parks.

The second tremor was the stronger, and was felt also at Fort Pisco and lightly at Lima, where it was almost unnoticed. Another strong tremor was felt at Huancavelica.

The shock was felt as far south as Bellefontaine, according to reports made to the Telephone Company here. Radiators in buildings were shaken but no damage was reported.

Guatemala City, June 28 - Frequent earthquakes of some intensity have continued for several days in the eastern part of the Department of Santa Rosa. Some of the tremors have been felt here. The focus of the seismic zone appears to be east of the volcano Tecaumburro.
Tokyo, June 28 - Fifteen persons were believed to have perished when a landslide buried two coaches of a railway train 50 miles northeast of Shimonoseki today.

Railway authorities said 36 persons were trapped in the coaches and 21 of these had escaped. Five hundred coolies were rushed to the scene and three bodies were recovered. Heavy rains caused the slide.

F. W. SOHON, S. J.
Director

International Seismological Centre From the ISC collection scanned by SISMOS

# SEISMOLOGICAL DESPATCHES

GEORGETOWN UNIVERSITY
WASHINGTON, D. C.

AUGUST, 1930.

Through courtesy of Associated Press.

Porto do Lima, Portugal, Aug. 4 - A sharp earthquake tremor was felt here this afternoon. No damage to property or loss of life was reported.

Gironald Italias, Potenza, Italy, Aug. 4 - A new earthquake was felt ten minutes after noon today at Melfi and Rio Nero, producing a great panic.

Ancona, Italy, Aug. 5 - Light earthquake shocks lasting ten seconds were felt this evening at Macerata, Astoli, Fabriano, Fermo and Porto San Giorgio. There was no damage and nobody was injured.

Ventura, Calif., Aug. 5 - Residents of this community were awakened at 3:27 a.m. today by two earthquake shocks, which broke windows and cracked walls in several downtown buildings. The first quake, a mild one, was followed by a second severe shock a moment later, which lasted for one minute.

The most serious damage was reported by the owners of the Palace Hotel, where plate glass windows were broken. The proprietor of an undertaking establishment said several lateral cracks appeared in his building. Santa Barbara reported a slight shock with no damage.

Lima, Peru, August 5 - Strong earth tremors were felt here at 12:40 p.m. today. No damage was done, but the populace became panic stricken and scurried to streets, squares and open places.

Madrid, Aug. 7 - Belated dispatches from the town of Albox, between Murcia and Almerta, on the Mediterranean, report a strong earthquake at four o'clock yesterday morning.

Some houses were damaged and the people ran into the streets panicstricken but nobody was injured.

Alcoy, Spain, Aug. 8 - An earthquake, lasting three seconds, shook this city at 5:20 o'clock this afternoon. There was panic among the residents and great crowds rushed into the streets, but none was reported injured. There was some slight property damage.

Ascoli Piceno, Italy, Aug. 9 - A succession of light earthquake shocks, preceded by rumbling, were noted yesterday at Montemonaco. Natives, and a number of foreign visitors fled to the streets. There were no damages and no one was injured.

Batavia, Java, Aug. 9 - The island of Krakatao, or, translated into English, - Child of Krakatao, which yesterday had a height of 170 feet, today disappeared beneath the surface of the sea during intense activity of nearby Krakatao which is throwing out fountains of fire.

Madrid, Aug. 11 - Sharp earth shocks were felt at 1:00 p.m. today at Montiel, Albacete Province, and five minutes later, at Valdepenas, in Ciudad Real Province. There was no damage or loss of life in either town but the people were thrown into a panic. The earth movements in each case lasted less than a minute.

Pozzuoli, Italy, Aug. 13 - A slight earthquake shock of undulatory nature was felt here at 1:35 a.m. today. Residents rushed into the streets. There were no casualties and no damage.

Guatemala City, Guatemala, Aug. 14 - Earth shocks of some intensity were felt here today and caused much alarm among the inhabitants.

Reggio, Calabria, Italy, Aug. 22 - A slight undulatory earthquake shock was felt here at 2:30 a.m. bringing about a panic among the populace. There was no damage. Roccella, Jonica, and Cantanzaro also felt the tremor.

Sobreira Formosa, Portugal, Aug. 24 - Sharp earthquake shocks early today caused a panic among the people of this village. The village suffered little damage.

Swansea, Wales, Aug. 26 - Several earth tremors were felt here last night but there were no reports of any damage. All South Wales experienced the tremors.

Dar-Es-Salaam, Tanganyika, British East Africa, Aug. 26 - Many buildings were slightly damaged this morning when an earthquake shook this district. There were no casualties.

Ventura, Calif. Aug. 30 - An earthquake caused buildings to sway here at approximately 4:40 p.m. today. No damage was reported.

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Teheran, Persia, May 12 - The death toll in recent earthquakes in Persia today was stated to be nearing 3000 persons.

The earthshocks are continuing but have lessened in their intensity at Tabriz. They still are very severe around Salmas. A rift in the earth two miles wide has opened between Urumyah and Salmas. Black water is running into Urumyah Lake from subterranean channels.

Teheran, Persia, May 21 - Latest reports state that two thousand bodies thus far had been recovered from the ruins left by the earthquake of May 10. The earthquake was most severe in Salmas and Azerbaijan.

Vatanzaro, Italy, May 16 - A strong earth shock, followed by a smaller one, was felt here early today. Similar tremblors alarmed the populations of Nicastro, Soveria, Simeri and Taverna.

Temuco, Chile, May 17 - The volcano Llaima, near here, has entered an eruptive stage. Unconfirmed advices say the nearby village of Huenivales has been destroyed by Lava.

Jerusalem, May 21 - Slight earth tremors were felt in Jerusalem shortly before 1:00 P.M. today. No damages or casualties were reported.

Hilo, Hawaii, May 21 - A strong earthquake which was felt on Hawaii, at 6:52 P.M. (local time) yesterday was said by Professor Thomas J. Jaggar today to have had its center in the area of the Hualalai Volcano. It was the second shock within twenty four hours. Hawaiian time is 5½ hours earlier than eastern time.

The shocks were felt strongly both on the Hilo, or eastern side of the island and in the Kona District, its western side.

Jaggar said the quakes were of the same character as those of last September and October when hundreds of shocks occurred. These were assigned by Jaggar to lava movements within the dormant volcano Hualalai.

Hilo, Hawaii, May 26 - A sharp earthquake shook Hilo at 8:17 o'clock last night (10:47 P.M., Pacific Standard Time). There was no damage. The Kilauea Volcano Observatory reported the quake but no volcanic activity. The quake also was felt in the Kona District on the opposite side of the island.

Tokyo, June 1 - An earthquake today heavily shook an area within a radius of 60 miles of Tokyo but only minor damages and no casualties were reported. A Tokyo central meteorological observatory communique stated that the quake's magnitude was twelve millimeters and that the disturbance was centered in the Pacific Ocean eastward from Tokyo and lasted twenty five minutes, starting at 2:58 A.M.

The quake was perceptible to humans for six or seven minutes. It was the longest and strongest of this year.

Clocks were stopped and frightened people ran from their houses here and in surrounding communities including Choshi, Mito, Unumomiya, Maebashi and Kofu.

F. W. Sohon, S. J.
Director

International Seismological Centre From the ISC collection scanned by SISMOS

# SEISMOLOGICAL DESPATCHES

GEORGETOWN UNIVERSITY
WASHINGTON, D. C.

bis.

Los Angeles, Aug. 30 - An earthquake shook Los Angeles at 4:39 p.m. today, rocking buildings for almost 30 seconds. The quake was general throughout Los Angeles, Pasadena, Inglewood and Santa Monica. In the latter city there were three distinct shocks. The tremor seemed to travel from Ventura to Los Angeles. Imperial Valley reported no shocks, nor did Santa Barbara.

A chimney was shaken from Berendo Junior High School. The quake also caused a bridge connecting two buildings and spanning the speedway, Main Highway, to cave in.

Some of the cornice work on St. Marks Hotel in Venica, a replica of St. Marks Palace in Venice, Italy, fell.

San Luis, Obispo, Calif. Sept. 2 - An earth shock of moderate intensity lasting about a second and a half, was felt here at 5:30 a.m. today. No damage was reported.

Murcia, Spain, Sept. 3 - A strong earthquake was felt here at 10:05 a.m. today, and was followed by another of less intensity at 2:30 p.m. The first lasted eight seconds. The quake in the morning sent the populace scurrying panic-stricken into the streets, but no deaths or injuries have been reported. Buildings swayed distinctly rattling chandeliers and paintings.

F. W. Sohon, S. J.
Director.

REPLY TO NOTICE
NOT RECEIVED

International Seismological Centre From the ISC collection scanned by SISMOS

# SEISMOLOGICAL DESPATCHES

GEORGETOWN UNIVERSITY
WASHINGTON, D. C.

July, 1930

Through Courtesy of the Associated Press

London, July 2, 1930 - An earthquake was reported in Calcutta early this morning but no details were immediately available.

Gauhati, Assam, July 3 - Nine severe earthquake shocks were recorded here within a period of six minutes early today. Many persons were injured, several buildings were demolished and telegraph wires were broken. Slight shocks continued long after the heavier ones.

Shillong, Capital of Assam, reported an earthquake of great intensity at 2:36 a.m. with moderate shocks following at intervals of a few minutes. Train service was interrupted on the eastern Bengal railway because of damage to bridges and tracks, while telegraphic service was entirely out.

Rangoon, Burman capital, learned that an earthquake in the Akyab district had brought on a tidal wave. Reports said much property was damaged, with communications cut off.

The quakes, accompanied by a rumble that frightened the inhabitants, were felt in Calcutta and were so strong that the seismograph of Alipore University was thrown out of order. Observatory officials said the region of their greatest intensity was in West Assam, but some damage was done here.

Calcutta, Bengal, July 4 - Reports today from Jalpaivurt, near Bengal, said earth shocks still were occurring in that vicinity, having been intermittent since the heavy quake of yesterday.

Several persons were reported injured and one large building collapsed at Rangpur. The town hall was damaged seriously. At Malda several buildings were damaged.

Seville, Spain, July 5 - An earthquake of four seconds duration shook Seville tonight. It was intense enough to move furniture and cause pictures to fall off walls. The quake was also felt at Cordoba and Granada but no serious damage was reported.

Wellington, New Zealand, July 5 - A sharp and fairly prolonged earthquake was felt here and at Christ Church at 4:30 p.m. today. No damage was reported.

Wellington, N.Z., July 6 - The second earthquake shock within two days was felt at Welling at 4:30 o'clock this morning. No damage was done. A sharp and fairly prolonged shock was felt yesterday afternoon.

Naples, Italy, July 7 - Mount Vesuvius today burst into a state of active eruption developing three fountains of burning lava that invaded the whole northwest section of the vast platform of its crater. The eruptive cone fell ninety five feet down into the crater. Alessandro Malladra, Director of the Vesuvius Observatory, said the eruptive activity would continue for several weeks.

Dhubri, Assam, India, July 8 - An unconfirmed report reached here today that the Sahki hills had been cleft asunder by an earthquake and a village in Kanchigaon completely swallowed up. The quake which caused the tragedy was among the first of 112 shocks registered in the last few days.

Calcutta, India, July 9 - Dispatches from Dhubri, Coalpara, and Assam, state that earthquakes continue. To date 118 shocks have been reported. Practically every building in Dhubri has been damaged more or less.

Shocks of milder intensity are also felt every few hours in the Rangpur district and at Coochbehar.

Guatemala, July 9 - Earthquakes which have been shaking eastern Guatemala intermittently for a month were more serious today. So widespread were the quakes that they were felt in Guatemala's Capital. Twenty-one homes and several public buildings were reported destroyed at Guazacapan.

Marion, Ohio, July 10 - A number of small buildings were shaken perceptibly by an earthquake here tonight.

The tremor, apparently a localized disturbance, was of slight intensity, and lasted only a few seconds, starting about 6:15 o'clock. No damage was reported. Many residents reported the shaking of buildings, jolting of furniture and rattling of dishes.

Naples, Italy, July 11 - The lava that has been flowing for five days in the crater of Mt. Vesuvius, today had invaded the whole western zone of the vast crater which has a diameter of about a half mile. The flow, issuing from two great fountains, has been, however, so tranquil as to cause only slight uneasiness at the Vesuvian Observatory. There have been few explosions and only a small quantity of gas.

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SEISMOLOGICAL DESPATCHES

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bis.

Guatemala City, July 15 - An earthquake shook eastern Guatemala yesterday. The shocks were severe in Santa Rosa and Jutipa Provinces where a few buildings were destroyed, and were strongly felt in the Capital but caused no damage.

Three Forks, Mont. July 17 - The fourth light earthquake in four days was felt last night. The movement, lasting four seconds, was reported from Bozeman, Lombard and Gateway. No damage was reported.

San Salvador, Republic of Salvador, July 17 - Thirteen buildings in the city of Anuachapan, El Salvador, were demolished by an earthquake today. The quake was the latest of a series of tremors which have been felt in that region for the past few days.

Rangoon, Burma, July 18 - Fifty persons were believed today to have been killed or severely injured in a severe earthquake 60 miles north of Rangoon in the Tharrawaddy District of Burma. Many houses collapsed. The villages of Letpadan was badly shaken.

Alcano, Sicily, July 22 - Two earthquake shocks, one of four seconds' duration and one of two, terrified the population here yesterday but no damage was done.

Naples, Italy, July 23 - A strong earth shock, lasting 14 seconds, was felt here and at Potenza and other villages in the region early this morning.

Several persons were reported killed or injured at the village of Barile, where a good deal of damage also was done. Naples felt the shock, which was undulating in character, at 1:06 a.m. Portenza, Matera and other towns felt the shock at 1:12 a.m.

The violence of the three fatal shocks -- grade seven on the Mercalli Scale -- was indicated by the calculations of seismographers that if it had reached grade ten on the same scale, the whole city of Naples would have been destroyed. The United States Consulate had no notice of any American victims in Naples or any of the nearby resorts.

Three violent shocks were felt shortly after one o'clock this morning and a lesser shock added to the horror at 6:35 a.m. The hamlet of Melfi in Apulia was the hardest hit.

All of the city's church bells pealed forth at the moment of the first quake as if to warn the inhabitants to flee for their lives. This was explained by the fact that undulating earth tremors set the bell towers to oscillating.

Town and church clocks throughout all the province were running again this evening. The quake had stopped them as if automatically at the moment of the chock, 1:10 a.m., thus giving the clearest evidence of the time of appearance of the subterranean upheaval.

Veterans of frequent earthquakes in this region said they could not remember any shocks more severe than those of this morning. The center of the seismic movement appeared to have been between Melfi, Ariano and Apuglia.

The center of the disturbance appeared to be at Visciano, Avellino Province.

Professor Alessandro Malladra, Director of the Vesuvian Observatory, said three shocks came in quick succession, lasting in all, about one minute. He said there was a violent agitation of the laboratory and the recording needles flew out of the seismographic zone, preventing exact calculation of the epicentre.

The Institute of Terrestrial Physics at the University of Naples, reported that there were three shocks, reaching an intensity between grades 6 and 7 on the Mercalli Scale, with maximum acceleration between 12.5 and 18 millimeters a second.

Rome, - An official recount of casualties was issued this morning, placing the dead from Wednesday's earthquake at 2,142 and the injured at 4,551.

The towns most seriously affected by the earthquake as reported authoritatively were as follows: Naples, Barile, Atella, Venosa, Buonalbergo, Rapolla, Rionero, Benevento Province, Salerno Province, Foggia Province. Other reports said casualties were recorded in Avellino and Potenza.

The tremors shook buildings and casualties resulted from the collapse of walls, church steeples and the like. The shocks were felt as far away as Ancona on the Adriatic Coast, and at Chieti, Teramo and Aquila in the Abruzzi region.

Thirty towns in Avellino were ruined, 21 in Benevento, 13 in Foggia and 19 in Potenza, making a total of 83 towns for which figures had been compiled at midday. There were a few scattered deaths on the rim of the intense quake zone in addition to those contained in the report.

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Of the 3,188 houses wrecked in the quake, 2,066 were in the Province of Avellino. Communes more heavily stricken were Ariano, Aquilonia, Montecalvo, Bisaccia, Lacedonia, Villanova and Accadia.

Rome - The earthquakes which shook southern Italy this morning were felt in Rome at 1:11 a.m. No damage was reported.

Refugees from Ariano, the population of which before yesterday's earthquake was 9,000, today described that town as a heap of ruins. Houses that were left standing, they asserted, must be town down because they were tottering and unsafe.

Avellino - There were fissures in the open ground near the Ofanto River today and it was believed that if the river overflowed its banks these would be transformed into lakes of considerable size.

Southern Italy was rocked by a steady procession of minor quakes throughout the day following upon the tremendous shocks an hour after midnight. The quake centered at Melfi

Portenza - A slight earthquake shock was felt in this region at 3 p.m. This was the fifth since an hour after midnight, when the great quake occurred.

The number of deaths for Avellino Province was subdivided among the larger towns as follows: Lacedonia 600; Aquilonia 400; Villanova 400; Montecalvo 300; Ariano 300; Sannicola 120; Rochetta 120.

Ariano - A new earth shock at about 10 o'clock here yesterday morning added another death to the long list.

Avellino - Slight undulatory earth shocks were felt in this vicinity at 1:10 p.m. and at 7:40 p.m. yesterday.

Potenza - Five new earthquake shocks were felt today in the zone devastated by Wednesday's upheaval. They damaged many weakened buildings but no injuries or loss of life from them were reported.

Two shocks occurred about 10 a.m. and three other brief ones followed at about three in the afternoon. They were felt throughout the whole wasted district.

In Melfi, one of the communities that suffered worst, the Pacchioli Palace crumbled. Many houses developed large and dangerous fissures.

Mexico City, July 24 - Special dispatches today reported that an earthquake last night shook the town of Pinotepa, State of Oaxaca. It was preceded by subterranean rumblings and accompanied by torrential rain. No casualties were reported.

Wellington, New Zealand, July 25 - A sharp earthshock, lasting one minute, was felt at Westport in the Karamea area today. The shock was preceded by a loud rumbling sound. The earthquake was felt here in a slight degree. No damage and no casualties were reported.

Duisburg, Altstaden, Germany, July 26 - Residents of this city were thrown into a panic by an earthquake here this forenoon which rocked furniture and shook pictures from walls. No casualties were reported.

Sofia, Bulgaria, July 26 - Numerous earth shocks were felt throughout the seismic region of Bulgaria today. No damage was reported but the population of several country villages was alarmed. The shocks were felt at intervals of nearly an hour and were accompanied by underground rumblings.

Panama City, Panama, July 30 - Two earthquakes visited the Canal Zone this afternoon, causing consternation in both terminals of the canal, but inflicting, so far as reported late tonight, only trifling damage.

Officials said the disturbance centered 50 miles southeast of Balboa, probably between Aguadulce and Penomone, in the interior of the Panama Republic.

The disturbance started with first a slight and then a stronger tremblor. Both lasted only about 20 seconds, although the seismograph at Balboa Heights indicated that there had been activity for approximately six minutes in that immediate section. Numerous reports ssid the disturbance was accompanied by deep rumblings.

Cristobal, Canal Zone, July 30 - The Canal Zone administration building at Balboa was severely shaken by today's tremblor. The Pacific side of the Isthmus received the most severe shock. The disturbance probably was in a known fault south westward of Balboa

The quake disturbances also were felt at Panama City.

Colon, Panama, July 30 - A single earthquake tremor along the Atlantic coast of the Isthmus of Panama was felt at 1:52 p.m. today. No damage was reported.

Vienna, July 31 - The seismographic institute today reported an earth tremor at Semmering, near Vienna. The shock occurred at 2:30 a.m., stopping clocks and rattling windows but causing no damage.

Salsberg, Austria, July 31 - Because of an earthquake in this vicinity on Saturday many wells have gone dry.

New Bedford, Mass. July 31 - Earth tremors that rattled windows and shook dishes from their shelves, were felt here tonight shortly before 9 o'clock, E.S.T. The tremors, according to reports, were exceptionally strong in Nonquit and Salter's Point and the south and southwest sections of the city.

Tegucigalpa, Honduras, July 31 - Strong earthquake shocks were felt here at 12:25 a.m. today, causing great alarm but doing no damage.

J. S. O'Conor, S. J.
(Acting Director.)

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# SEISMOLOGICAL DESPATCHES

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Courtesy of Rev. Antonio Due, S. J.,
Estacion Sísmológica de Cartuja, GRANADA, SPAIN:

CARTUJA, GRANADA (SPAIN), Nov. 12. An earthquake IV F.M. was felt this night at Cartuja; it was felt in the city as V F.M. with alarm. Recorded in the Seism. Station at 21-13-16.

HUÉRCAL OVERA (ALMERÍA), Nov. 16. A slight earth tremor was reported as III F.M.; unregistered at Cartuja Seism. Stat. 11-32-47.

GRANADA, SPAIN, Nov. 23. A small shock was felt as II F.M. in the city. Recorded at Cart. 5-4-49.

GRANADA, SPAIN, Dec. 1. Intensity III F.M. in the city. Recorded at Cartuja Seism. Station: 16-50-31.

Courtesy of ASSOCIATED PRESS:

NEW ORLEANS, Oct. 19. Distinct earthquake tremors today shook thirteen or more towns and cities of southeastern Louisiana, including New Orleans, but no damage of any consequence was reported.

The earthquake occurred about 6:15 A.M., literally shaking some residents of New Orleans and surrounding regions out of their beds.

Doubt existed as to whether two tremors occurred, or only one. Some narrators were positive that there were two shocks, about five minutes apart. It was definite that the first tremble lasted a full thirty seconds.

In Plaquenines, La., about 85 miles northwest of New Orleans, the quake was severe enough to shake the glass from street lights.

Today's earthquake is the first ever felt in New Orleans, according to older inhabitants and no historical record has ever been found of any previous similar shock.

FIASTRA, ITALY, Nov. 1. Eighteen earth shocks were felt here last night and continued intermittently until 1:20 o'clock this morning. The population of the town, which is near Macerata, on the fringe of the zone shaken earlier this week, was thrown into panic but no injuries or damage were reported.

COPENHAGEN, Nov. 1. A slight earth tremor lasting two seconds was experienced here shortly after midnight today. No damage was reported.

PUTBUS, GERMANY, Nov. 1. A light earthquake was felt here and elsewhere on the island of Rueben, last night. No damage resulted.

MALONE, N. Y., Nov. 1. A slight earthquake shook Malone and vicinity at 9:40 o'clock tonight. No damage was reported. The tremors were felt throughout a considerable area.

SOFIA, BULGARIA, Nov. 6. Earth shocks of considerable intensity were felt this morning along the Bulgaria-Jugoslavian border. The tremors caused a panic at Godec and at Berkovitza. Walls of several houses were wrecked but there were no casualties.

PUERTO MONTT, CHILE, Nov. 6. Cabulco volcano today was reported in eruption.

BUCHAREST, RUMANIA. Nov. 11. Earth shocks of short duration were felt in Bucharest this morning. No damage was reported.

ISTANBUL, TURKEY, Nov. 18. The city of Smyrna which is just recovering from disastrous floods was thrown into panic at 10:00 A.M. by a sharp earthquake.

No loss of life or property was reported.

PAVIA DO ALENTEJO, PORTUGAL, Nov. 18. Earth shocks were felt here today. No damage reported beyond fallen tiles.

PONTIAC, MICH., Nov. 19. A large section near Oxbow Lake was shaken tonight by what was believed to be an earthquake. The shocks were most severe in the regions of Oxbow, Union, Green, Cass, Orchard and Straits Lakes, near here. There were no reports of damage.

At Kego Harbor, houses were shaken so violently that many persons ran into the streets; dishes were rattled and scores of persons, aroused from sleep, telephoned the police and fire departments.

The shocks apparently covered a radius of 12 miles. They were first reported about 11 P.M. but were first attributed to an explosion.

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PONTIAC, MICH., Nov. 20. Last night's "earthquake" which shook the lake district of Oakland County turned out to have been a dynamite explosion.

Sheriff's deputies today discovered that 50 pounds of the explosive had been stolen from a county gravel pit near the "quake" area, and their theory is that it exploded while being carried away in an automobile.

HILO, HAWAII, Nov. 20. The Kilauea volcano continued to fling lava and flame today twenty-four hours after it began erupting, but the pyrotechnic display was diminishing.

A single fountain shooting 200 feet above the floor of the huge Halemaumau pit cast a glare 1200 feet to the rim surrounding the caldron of boiling rock. Scientists at the observatory predicted the eruption would last another full day.

Several other fiery fountains which burst through the lava floor when an earthquake shocked the volcano into action yesterday had ceased playing.

HILO, HAWAII, Nov. 21. Activity continued today with the great fire bowl of the Kilaueau volcano but the fountains of lava had almost subsided after shooting flames 200 feet wednesday.

The glow from the pit, 1200 feet deep, was visible last night in Hilo, 30 miles away.

TIRANA, ALBANIA, Nov. 21. Thirty persons were reported killed during a violent earth shock at 3 o'clock this morning at the Valona region. Most of the damage occurred in the towns of Messaplik, Palase, Terkcei and Dermi. Many others were injured and nimerous houses were destroyed.

VIENNA, Nov. 21. A government dispatch from Tirana reported tonight that a violent earthquake had showed thirty deaths in the Albanian village of Telgac, District of Valona.

The dispatch added that great numbers were injured in the collapse of numerous houses, with heavy material losses.

The entire population was made homeless.

TIRANA, ALBANIA, Nov. 22. Seven villages were destroyed and more than 50 persons killed in the earthquake which yesterday at 3 p.m. shook the Valona District, on the shore of the Adriatic.

More than 200 persons were injured. The villages to suffer destruction were Terbac, Brataj, Thermi, Dukat, Lepenio, Vranisht and Llogara. The tremor lasted 20 seconds.

TIRANA, ALBANIA, Nov. 23. Slight earth tremors were felt today at Terbatch and Dukar, in the same region of southern Albania where an earthquake caused more than 50 deaths Friday.

Most of the houses in the two towns have been destroyed by the previous shocks.

BATVIA, JAVA, Nov. 26. The volcano Merapi, in Java, has been showing a greatly increased activity since Sunday. Subterranean rumblings can be heard at a great distance, and a stream of red hot lava is slowly pouring down the mountain slope.

TOKYO, Nov. 26. At least 215 persons were killed and several hundred injured today in eastern Japan's most destructive earthquake since the disaster of 1923.

Striking a score of towns and villages of northern Iqu Peninsula, the playground of Japan, at 4:03 A.M., (2:03 P.M. E.S.T. Tuesday) the quake destroyed or seriously damaged 4,500 buildings according to an official estimate.

The quake apparently was the climax of a series which have been felt recently through the northern part of the peninsula. The region experienced an average of 300 minor shocks daily since November 10, including a severe quake yesterday afternoon.

The quake was felt over a wide area. Tokyo and Yokohama felt the shock, but no serious damage was done in these two cities.

Fire followed the quake in many places, adding materially to the damage. Homes, bridges and railroads were destroyed.

Fires burst from ruins, the earth cracked open, land slid from the mountains and water loosed by broken reservoirs added to the havoc and confusion.

Warned, however, by sixteen days of preliminary tremors, most people had extinguished fires in their homes before sleeping and therefore escaped a conflagration such as that which, adding its horror to the earthquake of 1923, destroyed 10,000 buildings in Toyko and killed approximately 100,000 persons.

Reports indicated the heavies blow fell upon the area extending from Mishima to Numazu, a region about fifteen miles long and five to ten miles wide.

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# SEISMOLOGICAL DESPATCHES

## GEORGETOWN UNIVERSITY

## WASHINGTON, D. C.

Year 1939

January

MANILA, JAN.5 -(AP)- A fairly heavy earthquake of 10 seconds duration shook Manila at 11:25 A.M. today (10:25 P.M., Jan,4, EST). There were no reports of damage or casualties.

OMETEPEC, MEXICO, JAN.16 -(AP)- An earthquake rocked this town, near the Pacific Coast in GUERRERO STATE, southwestern Mexico, yesterday afternoon. No damage was apparent.

SANTIAGO, CHILE, JAN.25 -(AP)- A series of earthquakes shortly before midnight rocked this capital and a large section of central Chile and early today communications were disrupted with the large cities of Concepcion and Talca. The shocks spread panic through a 400 mile strip along the Chilean coast and eastward 75 miles across the country. The first of the series of quakes was felt in Santiago at 11:35 P.M. No damage was done here. In other cities the shocks lasted more than a minute.

The state railways office had reports before communications went out at Talca that at least two were killed at CORDILLERA. Big flashes preceded the temblor there, possibly caused by eruption of the Quizapu volcano. First reports said the majority of houses were destroyed in REMICO, small town 50 miles south of Concepcion, and the railway disrupted in numerous places.

Reports from TALCA said eight persons were killed and 20 injured there, but little damage was caused by the quake. An aviator flying over CHILLAN, a city of 40,000 population, 220 miles south of Santiago, reported the almost complete destruction of that historic town. The dead were being buried in trenches in the street, he declared, and only three houses in 144 blocks appeared habitable.

CAUQUENES, a city of 6,500 population, noted for its mineral springs, 200 miles south of Santiago, was officially reported largely destroyed. Its inhabitants were camping in the streets, but the number of casualties was not known. ANGOL - five dead. CAUTIN - many victims; serious damage. VALPARAISO 60 miles northwest of Santiago and the northernmost point to report damage - minor surface cracks in buildings. CURICO - many buildings were damaged. Several walls collapsed. Hundreds of worried inhabitants slept in streets. TRAIGUEN - several buildings were damaged.

BUENOS AIRES, JAN,25 -(AP)- La Nacion's correspondent in Santiago, Chile, said tonight Lieut. Yanez, an aviator, had landed at Chillan and returned with the information that 5,000 persons perished in the quake there last night.

Violence of the shock opened fissures in CHILLAN streets 12 feet wide, and huge ditches were being dug to bury the dead as quickly as possible. The roof and walls of a theater collapsed crushing 300 persons to death. The aviator confirmed reports that the towns of PARRAL and CAUQUENES were destroyed and that a great part of SAN CARLOS was in ruins.

CHILLAN, CHILE, JAN.29 -(AP)- A series of minor earth shocks today jarred the ruins of this ancient city of 40,000 population which was virtually wiped off the map in Tuesday's (Jan.24) devastating earthquake. Several landslides resulting from the earthquake forced suspension today of service on the trans-Andean Railway. A government official said a survey had disclosed that only 20 houses remained standing in Chillan.

SANTIAGO, CHILE, JAN.30 -(AP)- New panic was reported today among survivors of Chile's disastrous earthquake after more shocks, described as "very strong", in the same region where between 25,000 and 30,000 already had died. The new temblors, lasting more than two minutes, rocked Chillan and Concepcion shortly before last midnight, injuring 20 persons and spreading terror among the homeless sleeping in the public plaza at Chillan.

Some sources said the new shocks were almost as strong as those of Jan,24 which destroyed Chillan and left an estimated 15,000 dead. There was little property left to be damaged, however. At CONCEPCION, several more walls caved in. A tabulation of the latest conservative estimates of deaths by localities follows:

CHILLAN, 15,000; NUBLE PROVINCE and CONCEPCION, 2,500; BULNES, 2,5000; CAUQUENES, 2,000; PARRAL, SAN CARLOS and LINARES, about 2,000; scattered farming areas, 2,000.

CAUQUENES, one of the latest of the towns to report on the disaster, had a population of 5,000. Its authorities advised Santiago that every house in the community was destroyed and that several shocks were felt for two days after the

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violent earthquake of Jan. 23. Virtually every farmhouse in the Cauquenes area was said to have been destroyed.

Up to last night, 1,040 bodies had been buried at concepcion and the small town of Bulnes, where the population was 5,000, had buried 2,004.

SAN SALVADOR. SALVADOR, JAN.30 -(AP)- The western portion of Salvador was shaken by an earthquake today. Only minor damage was reported.

February

SANTIAGO, CHILE, FEB.1 -(AP)- Observatories around Santiago reported today that more than 300 earth shocks had been recorded in the past week since the devastating earthquake which took perhaps 30,000 lives. Many of the shocks were so slight they were unfelt, but one of moderate intensity was reported Monday night (Jan.30) at L. SERENA, 600 miles north of the disaster zone and another strong tremor was felt at CHILLAN which was demolished last week.

TILLAMOOK, OREGON, FEB.15 -(AP)- Slight earth shocks were felt along the Oregon coast in this region between 5 and 6 A.M. (8 and 9 A.M., EST) yesterday. Dishes danced on shelves and windows rattled but no damage was reported. Towns in a 25 mile strip of shore from Tillamook north to WHEELER reported feeling the quakes.

March

TOKYO, MARCH 20 -(AP)- An earthquake described by the Central Meterological Observatory as the strongest in five years rocked southern Japan today, destroying communications and power lines and damaging hundreds of homes. The number of casualties, if any, was not known. The original shock came at 12:23 P.M. (10:23 P.M.,Mar.19,EST) after which settling shocks were felt throughout the islands of KYUSHO and SHIKOKU. Broken windows and chimneys were reported as the bulk of the damage to homes, thousands of persons ran into the streets and sought the safety of open spaces during the shocks.

EL CENTRO, CALIFORNIA, MARCH 21 -(AP)- The second sharp earthquake of the day jarred portions of the Imperial Valley at 5:51 A.M. (PST) today accompanied by a clearly audible roar. The tremor lasted five seconds, rattled dishes but did no damage. It also was felt strongly in CALEXICO, to the south on the Mexican border, but not in Brawley, 14 miles north. A one-second "jarring" quake was felt at 12:55 A.M. (3:55 A.M.,EST).

BUDAPEST, MARCH 25 -(AP)- Earth shocks were felt in the region near the Rumanian frontier today. The shocks continued intermittently for 40 minutes. Several chimneys toppled. Plaster fell from ceilings and pictures from walls. Reports from the region said the earthquake had caused but slight damage.

RUCUMAN, ARGENTINA, MARCH 24 -(AP)- This northern Argentina city was rocked by a strong earthquake at 9 P.M. last night. Residents were badly frightened. The temblor cracked many walls, but there were no victims.

April

EL CENTRO, CALIFORNIA, APRIL 15 -(AP)- A light earthquake, causing no damage, rocked El Centro at 2:42 A.M. (5:42 A.M.,EST) today. Two weeks ago a series of minor temblors were felt here and in nearby Mexico.

NEW MADRID, MISSOURI, APRIL 15 -(AP)- An earth tremor shook New Madrid and vicinity at 11:25 A.M. today. It lasted two minutes. Buildings swayed noticeably but there was no damage of consequence.

SANTIAGO, CHILE, APRIL 18 -(AP)- A heavy earth shock was recorded at 2:30 today in the area around COQUIMBO and ATACAMA PROVINCE.

SAN DIEGO, CALIFORNIA, APRIL 19 -(AP)- A sharp earthquake which lasted half a minute shook San Diego at 11:42 last night (2:42 A.M., Apr.19, EST) and aroused residents throughout the city. Transbay Coronado residents said a dull rumble preceded the temblor. No damage was reported.

May

AKITA, JAPAN, MAY 1 -(AP)- Sixty thousand terror-stricken residents of this northern Japanese coastal city fled to the open spaces today during a series of earth

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shocks described as the most severe in 25 years. The Quake shook widespread sections of Northern Japan. The town of FUNAKOSHI was burning and known damage in AKITA included the collapse of homes and the shattering of nearly all glass showcases in the stores.

SAN DIEGO, CALIFORNIA, MAY 1 -(AP)- The fifth in a series of light earthquake shocks rattled windows, swayed ceiling lamps and rocked downtown buildings at 3:50 P.M. (6:30 P.M., EST) today. No damage was reported.

TOKYO, MAY 2 -(AP)- A police survey disclosed today that 1,500 dwellings were destroyed or damaged and at least 19 persons were killed by earthquakes and ensuing fire and floods in villages 300 miles North of Tokyo monday.

The number of missing persons remained undetermined. The entire population of Akita Prefecture huddled together in open spaces as recurrent shocks brought new landslides and toppled weakened walls. Nine houses of the village fo AIKAWA were swallowed by the sea.

SANTIAGO, CHILE, MAY 6 -(AP)- Two temblors today demolished a few already damaged walls at CHILLAN and CONCEPCION, cities wrecked by the January earthquake.

MANILA, MAY 7 -(AP)- An earthquake of moderate intensity shook the Manila region at 1:01 A.M. today, and lasted 20 seconds. No casualties or damages were reported.

PONTA DELGADA, AZORE ISLANDS, MAY 8 -(AP)- An earth shock was felt here today at 1:45 A.M. (8:45 P.M.,Sunday,EST) but no damage resulted.

HILO, HAWAII, MAY 8 -(AP)- An earthquake at 7:03 A.M. today rattled windows in Hilo and was registered as slight on the volcano observatory seismograph.

INDIO, CALIFORNIA, MAY 12 -(AP)- A short, jerky earthquake was felt in the COACHELLA VALLEY at 11:26 A.M. (PST) today. It had an East-West motion.

SANTIAGO, CHILE, MAY 12 -(AP)- A strong earth temblor was felt tonight in LA SERENA, northern Province of COQUIMBO. No casualties were reported.

TAIHOKU, FORMOSA, MAY 16 -(AP)- An earthquake of moderate intensity shook the whole island of FORMOSA today but early reports indicated there were no casualties and no serious damage.

HILO, HAWAII MAY 16 -(AP)- Scientists watched Kilauea Volcano for possible signs of eruption today after an earthquake which caused minor damage to some buildings here yesterday.

The quake, described as "moderate to strong" occurred at 10:27 A.M. (12:57 P.M., PST) and caused cracks in several office buildings, loosened a beam in a newspaper plant and precipitated a large landslide in Kilauea's Crater.

MANILA, MAY 19 -(AP)- Tiny VERDE ISLAND, some 100 miles south of Manila, with a population of 4,000, was reported tonight to be quaking and sinking fast into the sea. Governor Vicente Casdo of Batangas Province reported to government headquarters here that persons on the island, only 15 kilometers square, were being evacuated.

ARICA, CHILE, MAY 19 -(AP)- An earthquake caused a panic in this town of 15,000 at 2:45 P.M. today. Although many walls crumbled, no persons were reported injured.

MANILA, MAY 20 -(AP)- Refugees fleeing verde island's earthquakes said today tremors during the last two weeks had opened fissures on the island causing a portion of its surface to settle. They said the quakes became more numerous Thursday, tumbled rocks from hillsides and caused a one meter depression in one plot of ground. There was no evidence, however, that the entire Island was sinking, they reported.

MEXICO CITY, MAY 23 -(AP)- Two earthquakes -of one minute and three minutes respectively and of light intensity- were registered by the government seismograph last night. They centered somewhere along the Pacific Coast.

HILO, T.H. MAY 23 -(AP)- An earthquake sharp enough to dismantle seismographs and start a huge landslide in KILAUEA was felt in Hilo and throughout the Kilauea Volcano region at 2:14 P.M. (7:44 P.M.,EST) today. Residents said the quake seemed sharper than one May 15 which also dismantled seismographs and started a landslide. No damage was reported.

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MEXICO CITY, MAY 30 -(AP)- A light earthquake, its epicenter about 200 miles southwest of here, was recorded today. No damage was reported.

PERRYVILLE, ALASKA, MAY 30 -(AP)- Inhabitants of this Alaska Peninsula settlement had to keep their lamps lighted again today as ashes and thick, sulphurous smoke from erupting Mount Veniaminof, 15 miles away, darkened the sky. Residents have kept themselves in readiness to flee since May 23, when the volcano became active after a slight earthquake.

ATHENS, MAY 31 -(AP)- A strong earth shock was felt at 2:20 A.M. today (May 30, 7:20 P.M.,EST). In PATRAS, the walls of several buildings were cracked and the terrified population poured into streets in night-clothes but there was no loss of life.

JUNE

TULSA, OKLAHOMA, JUNE 1 -(AP)- Several eastern Oklahoma cities felt earth tremors strong enough to jar buildings early today but no damage was reported. Scores of Tulsans were awakened shortly before 2 A.M. by a tremor one observer said lasted "six or seven seconds," It was noticeable in apartment buildings and upper floors of houses.

A shock in CHECOTAH of sufficient intensity to rattle windows, was reported to have lasted ten minutes. MUSKOGEE and HOLDENVILLE also felt the quake. A HOLDENVILLE police sergeant said it shoved his desk about six inches.

SAN JOSE, COSTA RICA, JUNE 13 -(AP)- A violent temblor shook San Jose today. There were no reports of damage or casualties.

LITTLE ROCK, ARKANSAS, JUNE 19 -(AP)- Little Rock was shaken by a slight earth tremor at 3:44 P.M. (CST) today. No damage was reported immediately. PINE BLUFF, 42 miles southeast of here, also reported feeling the tremor. The Little Rock Weather Bureau, where a stack of books was dislodged by the movement, said the tremor was apparently of not more than two secods duration.

AMSTERDAM, JUNE 19 -(AP)* The volcanic island of KRAKATOA erupted today, flinging lava to a height of 30,000 feet reports from nearby Java said.

LONDON, JUNE 23 -(AP)- An earthquake killed 11 natives and injured 28 in GOLD COAST, British West African Colony, last night, the Colonial Office was informed today in a telegram from Accra.

ATHENS, JUNE 27 -(AP)- Severe earth tremors yesterday and today destroyed several houses in the AGRINION DISTRICT, 150 miles west of Athens. No loss of life has been reported.

SAN FRANCISCO, JUNE 24 -(AP)- Earth tremors were recorded from west central California south into Mexico today, but reported damage was nominal. There were no deaths or injuries.

One shock centered approximately 85 miles southeast of SAN FRANCISCO. It broke dishes, toppled chimneys and overturned furniture at CIENEGA, cracked brick walls at HOLLISTER and caused a winery wall to crumble at SAN BENITO. GILROY and SALINAS also felt the temblor. At HOLLISTER it was described as the most violent since 1906.

The second tremor swayed chandeliers and shook chairs at SAN DIEGO and was felt south with varying degrees to TIJUANA, MEXICO. The first shock was timed at 5:01:40 A.M. (8:01:40 A.M., EST). The second at 8:28:03 A.M.

JULY

PASADENA, CALIFORNIA, JULY 5 -(AP)- An earthquake "strong enough to do damage" was recorded at 2:52 P.M. (5:52 P.M., EST) today.

PALENA, ITALY, JULY 12 -(AP)- A strong earthquake in this region, about 50 miles east of Rome, brought people hurrying from their beds early today as houses shook and chimney bricks fell. No injuries or serious damage were reported.

SAN FRANCISCO, JULY 17 -(AP)- A slight earthquake was felt here about 1:25 A.M. (4:25 A.M., EST) today. Police said they received several calls telling of the shock. No damage was reported.

MENDOZA, ARGENTINA, JULY 27 -(AP)- Double earth shocks caused a widespread panic today. No damage was caused, but hundreds of persons, fearing the world was coming to an end, ran from their homes, prayed, screamed and fired guns into the air. The first shock at 6:36 A.M. lasted about 50 seconds, the second came 24 minutes later.

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PORT OF SPAIN, TRINIDAD, AUG. 11 -(AP)- A severe earthshock, said to be the worst felt in this West Indian Island for years, caused residents of the lower part of the city to flee from their houses early today. No casualties or serious damage were reported immediately.

HAVANA, AUG. 15 -(AP)- An incomplete report of an earthshock felt several places in SANTA CLARA PROVINCE said today a hospital at REMEDIOS had been damaged and many persons injured. The tremor was recorded as one of moderate intensity, lasting two seconds. It came at 11:45 P.M., EST yesterday.

SEPTEMBER

ISTANBUL, TURKEY, SEPT. 22 -(AP)- A heavy toll of lives and property was taken by an earthquake today at SMYRNA, reports received here said.

The PERGANE, KOTCHILI and FOTCHA districts were said to be the hardest hit, with more than two-thirds of the number of buildings there destroyed.

ISTANBUL, TURKEY, SEPT. 23 -(AP)- More than 200 persons were reported killed today in an earthquake said to have caved in more than 1,000 buildings in the SMYRNA region. The shocks were said to be continuing, accompanied by thunderous underground noises causing panic among the population. The temblors were felt here and at ANKARA, but in neither place was there loss of life or property damage.

ISTANBUL, TURKEY, SEPT. 27 -(AP)- Earthquakes of increasing intensity today shook the region around ANKARA. Eighteen shocks have been felt in the past 24 hours. First reports said many houses had been destroyed, but no loss of life was reported.

Many small Aegean Islands also were severely affected by the quakes. Considerable damage was reported on the Islands of SANTORINI and MYTILENE.

KRISTIANSAND, NORWAY, OCT. 9 *(AP)- An earthquake shook southern Norway with such rumbling roars today that the lighthouse keeper at Oksoe thought mines were exploding. No damage was reported.

MANCHESTER, N.H.,OCT. 11 -(AP)* Three earthquakes, the third lasting a "little more than a minute", shook southern New Hampshire today. Residents of TILTON, NORTHFIELD and SANBORNTON reported a tremor in their communities early yesterday.

Reports from DERRY, EAST MANCHESTER and GOFFSTOWN today told of houses shaking and a dull roar at times which coincided with recordings at the Harvard University Seismograph station.

SANTIAGO, CHILE, OCT. 17 -(AP)- A violent earthquake at CONCEPCION at 2:40 P.M. today caused a panic. People fled their homes fearing a repetition of last January's disaster.

BOSTON, OCT. 19 -(AP)- Earth tremors, described by seismologists as "severe" were felt today in several sections of Northern New England but no serious damage was reported. The shocks were felt from shortly before 7 A.M. until about 7:05 A.M. Communities reporting that buildings shook and dishes rattled were: WORCESTER, SPRINGFIELD and LAWRENCE, MASS., NASHUA and KEENE, N.H., and PORTLAND and AUGUSTA, ME., and ST. JOHNSBURY, VT.

Automobilists said their cars swayed; one PORTLAND householder said coffee spilled over on a stove, and a resident of KEENE said he experienced what he thought was a dizzy spell.

ALBANY, N.Y. also felt the shock as did cities and towns in eastern Canada, including MONTREAL and TORONTO.

MANILA, OCT. 31 -(AP)- An earthquake strong enough to cause theater patrons to rush into the streets shook the summer capital, BAGUO, last night for ten seconds. No damage was reported.

NOVEMBER

SANTIAGO, CUBA, NOV. 3 -(AP)- Slight earth tremors were felt here tonight, causing considerable alarm but resulting in no damage.

GRASS VALLEY, CALIF., NOV. 7 -(AP)- An earthquake accompanied by a report resembling an explosion rocked this densely populated mining area at 10:25, EST tonight, alarming townsfolk and startling miners working as far as two miles underground. The tremor sent huge steel head frames of NEVADA COUNTY'S famous gold mines into violent vibrations. Many householders were astonished when the doors of their homes flew open, dishes rattled from shelves, and bricks fell from chimneys. As far as was known, no one was injured, and no buildings were seriously damaged.

PORT-AU-PRINCE, HAITI, NOV.7 -(AP)- An earthquake of fairly severe intensity shook

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Port Au Prince at 10:43 A.M. today. Only minor property damage was reported but a few persons were injured in excitement following the tremor.

SEATTLE, WASH., NOV.12 -(AP)- An earthquake felt in many sections of OREGON, WASHINGTON and BRITISH COLUMBIA caused minor damage in Seattle and other cities last night but no one was injured. Damage consisted mostly of cracked walls, broken water mains and broken power lines.

In all parts of SEATTLE residents rushed to the streets in their night attire and many spent the remainder of the night in auto camps. A corner section of the National Bank of Washington in TACOMA, weighing approximately 250 pounds, crashed six floors into an alley. Some plaster damage was reported in the State Capitol at OLYMPIA. N.M.Breck, Capitol watchman, said it felt as "though the whole building was jumping up and down." He said it broke some glass bud did no serious damage. OLYMPIA reported hundreds of persons fled into the streets.

In SEATTLE the quake was strong enough to upset the needle on the seismograph at the University of Washington. A high tension wire fell in TACOMA TIDEFLATS causing a flash seen several miles. In the Grays Harbor Area which includes ABERDEEN, HOQUIAM and RAYMOND, several water mains were broken and several telephone lines were disrupted.

The quake appeared to extend over an area from Portland, north through Longview, Aberdeen and the Grays Harbor district, Tacoma, Seattle, Everett and Vancouver, B.C. and then east almost to Spokane.

PHILADELPHIA, PENNA.,NOV.15 -(AP)- A ten-second earthquake shook the eastern seaboard from BALTIMORE to TRENTON,N.J., just before 10 o'clock last night (EST) but apparently caused no serious injuries or property damage. The shocks hit an area about 130 miles long and 30 miles wide, and frightened residents on Northern Maryland, Delaware, Southern New Jersey and Eastern Pennsylvania.

Jolted from a doze, a Philadelphian exclaimed "It felt just like two fellows picked up the davenport and shook it back and forth like a baby's cradle."

The greatest alarm was felt in WILMINGTON,DEL., and GIBBSTOWN,PENNSVILLE and DEEPWATER,N.J., sites of powder and chemical plants. Residents rushed into the streets crying; "which plant blew up?" Rumbling like distant thunder, the shock knocked down pictures, overturned furniture and brought out emergency guards against fire.

DECEMBER

SAN SALVADOR, EL SALVADOR, DEC.13 -(AP)- Earth shocks were reported from many sections of El Salvador last night but no damage resulted.

A strong shock was felt at SAN VICENTE, which was partly destroyed by an earthquake three years ago.

SAN JOSE, COSTA RICA, DEC.21 -(AP)- A violent earthquake shook this central American Republic today, but caused no great damage.

BATAVIA, JAVA, DEC.22 -(AP)- Strong earthquake shocks today wrecked 108 houses and demolished a bridge in the Province of MENADO, in the northern part of Celebes Island. Several Persons were injured slightly. The shocks occurred about 4:30 P.M.,EST,DEC.21.

MANAGUA, NICARAGUA, DEC.26 -(AP)- An earthquake shook the Pacific Coast of Nicaragua today starting about 7A.M.,EST and lasting about 12 seconds. Houses swayed in the towns of LEON, CHINANDEGA and CORINTO, but this city was not seriously shaken. No damage was reported immediately.

SAN SALVADOR, SALVADOR, DEC.26 -(AP)- strong earthquake tremors were felt tonight in several provinces in the Republic of Salvador but no damage was reported.

SAN SALVADOR, EL SALVADOR, DEC.27 -(AP)- A fairly heavy earthquake shook San Salvador today at 6:55 A.M.,EST, frightening inhabitants but causing no damage locally. Whether the shock caused damage in the provinces is not yet known.

LOS ANGELES, CALIF. DEC.27 -(AP)- An earthquake was felt in Los Angeles at 11:29 A.M.,PST, today. It rocked the Associated Press Office, located on the fourth floor of the Herald-Express building. In the 33-story Los Angeles City Hall, chandeliers swayed for a few seconds and pictures on some walls went awry.

In Long Beach today's quake was said to be the hardest since the big one of 1933. Employes in large buildings in LONG BEACH scurried for safety. Some took positions under beams and others ran into the streets

GLENDALE and ALMAMERA, lying northeast of Los Angeles proper, also reported "sharp shocks." ANAHEIM said it was the sharpest shock felt there in several years. No damage was reported. Riverside, 60 miles east of Los Angeles, barely felt the disturbance

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ANKARA, TURKEY, DEC.27 -(AP)- Four severe shocks were felt in Western Turkey between 2 A.M. and 5 A.M., today (7 and 10 P.M., EST, Dec.26). The center of the shocks was believed to be in the JANIK MOUNTAIN range whose peaks reach 10,000 feet. But the entire slope from the main range to the Black Sea suffered, with several good sized towns almost wholly levelled and hundreds of villages wiped out.

Dwellings were shaken down. Minarets toppled from Mosques and domes crashed down upon roofs which fell in upon sleepers sheltered beneath them. Walls tumbled into streets. Water and gas mains were ripped asunder as the earth bulged in some places and burst open in gaping crevices in others. Railway tracks and bridges were twisted and broken and power lines in the more populated places were snapped. Fear maddened cattle stampeded in farming communities.

Fragmentary reports from ERZINCAN PROVINCE said virtually every one of the 16,000 inhabitants of the ancient town of that name were killed or injured. They were trapped in their beds by the first shocks. The walls of just one building -The Great Barracks- was left standing in the town, which was destroyed by another quake in 1784.

In SIVAS VILAYET, the little town of ZARA had 1,500 inhabitants killed and 1.000 houses destroyed.

The quakes caused frightful destruction in HAFIK, BAYBURT, SUSEHRI, SHARKISHLA, KUYULUHISSAR, TERDGAN, TRABZON, VAKFIKEBIR, MACHKE, and KIRASUN. Heavy damage was also reported at SAMSUN, ORDU, TOKAT, AMASIA, YOSGAD and other places. Whole villages were buried under the steep cliffs of the Janik Mountains. Bursting gas mains and overturned oil lamps set fire to collapsed buildings in almost every corner of the wide disaster area

ANKARA, TURKEY, DEC.28 -(AP)- Three additional tremors, sub-zero weather and blizzard winds which spread ravaging fires added to the damage and panic of the Anatolian Earthquake today. The new shocks last night were accompanied by awesome rumblings under Anatolia, "landbridge" between the continents of Europe and Asia.

ORDU, SIVAS and AMASIA were scenes of widespread havoc. The districts of ERZINCAN and KEMAN were hardest hit in the latest disaster.

The mounding death toll in the stricken area led officials to express belief the total dead might reach 50,000 as starvation, cold and disease created new perils for survivors of the catastrophe. Officials had put the dead and injured in Erzincan Province alone at 42,000.

LONDON, DEC.28 -(AP)- An Exchange Telegraph (British News Agency) dispatch from CAPETOWN today said there had been 25 earth tremors during the past 24 hours in the RAND, in TRANSVAAL. Two tremors were severe, jarring buildings and alarming residents.

SALINAS, CALIF., DEC.28 -(AP)- An earthquake was felt here at 7:15 A.M.,EST. Many persons were awakened. No damage was reported.

BUDAPEST, DEC.28 -(AP)- Two new earthquake shocks estimated to be about 1,200 miles from here were recorded by the Budapest National Observatory at 10:28 A.M., EST. The second was of considerable force.

Simultaneously all telephonic communications to Istanbul were suspended due to an unexplained break in the lines.

F.W.Sohon, S.J.
Director

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# SEISMOLOGICAL DESPATCHES

## GEORGETOWN UNIVERSITY

## WASHINGTON, D. C.

1938

January

MEXICO CITY, JAN. 2 -(AP)- A severe earthquake shook Mexico City today at 4:28 P.M. (5:28 P.M. EST). There were no reports of serious damages within the capital immediately. Thirty thousand bullfight fans were in an arena when the huge concrete and steel structure swayed from the shock.

HELENA, MONTANA, JAN.22 -(AP)- Two "weak" earthquakes were felt here yesterday. Each lasted about one second. The second shock was the 2,441st in a series which began in the fall of 1935. No damage was reported.

HONOLULU, JAN. 23 -(AP)- The Hawaiian Islands, shaken last night by the "worst earthquake in eleven years," found today damage was limited to a little cracked or loose plaster.

The temblor, which began at 10:05 P.M. (3:35 A.M., Jan.23, EST) and continued for two minutes, was felt throughout the islands. Its intensity varied. Volcanoes on the island of Hawaii showed no signs of disturbance. Reports from the seven islands today mentioned no injuries.

February

QUITO, ECUADOR, FEB.5 -(AP)- Delayed dispatches from the southern part of Colombia reported today that a severe earthquake shook the city of MANIZALES and the surrounding region late last night, causing at least two deaths. Numerous buildings were damaged, lamp posts were thrown into the street and a wireless tower fell down.

TOKYO, FEB.7 -(AP)- Tokyo and the surrounding district was shaken by a comparatively severe earthquake at 11:45 P.M. tonight (9:45 A.M., EST). Clocks were stopped by the shock. Early reports did not mention casualties or serious damage.

GUAYAQUIL, ECUADOR, FEB.8 -(AP)- A fairly heavy earthquake shook most of Ecuador's coastal provinces at 12:42 A.M. today and a lighter shock at 2:16 A.M. Early reports did not mention casualties or damage. (Ecuador time is the same as EST)

BRADLEY, CALIFORNIA,

April

BRADLEY, CALIFORNIA, APRIL 12 -(AP)- Three light earth shocks were felt here today but no damage was reported. The shocks occurred between 6 and 8:25 A.M. (9 and 11:25 A.M., EST).

EL CENTRO, CALIFORNIA, APRIL 12 -(AP)- Six earth shocks today cracked plaster in two buildings here and toppled over displays in some stores. The quakes came between 6:40 and 8:16 A.M.,PST (9:40 and 11:16 A.M.,EST). Tremors were felt elsewhere in IMPERIAL.

EL CENTRO, CALIFORNIA, APRIL 13 -(AP)- An earthquake severe enough to stop some clocks occurred in this region at 11:30 A.M. today. No damage was reported. A series of six shocks occurred in Imperial Valley yesterday. Today's quake also was felt at YUMA, ARIZONA.

ANKARA, TURKEY, APRIL 21 -(AP)- The Anatolia earthquake toll of dead and missing soared to at least 800 today after a night of continuing shocks which 50,000 homeless spent in mad terror. Terrific underground rumblings were accompanied by intermittent earthshocks over a wide area of western Asia bordering the Aegean Sea, and especially about KIRSHEHR, YOZGAD and TCHORUM. Panic stricken refugees fled from crevices full of boiling water.

Eighteen villages were utterly destroyed, and 22 others were badly damaged. Whole families were buried under mountainous debris. The quakes first were felt about 1 P.M. April 13 and lasted until nightfall. They were renewed last night.

May

MEXICO CITY, MAY 2 -(AP)- A short, sharp quake shocked Mexico City at 8:15 P.M. (CST) this evening, but did the city no damage of any consequence. Blue light flared over uptown buildings as power cables swung together and parts of the city were plunged into temporary darkness.

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PLYMOUTH, MONTSERRAR, MAY 6 -(AP)- An earthquake of moderate intensity was felt in this West Indian Island of Montserrat today. No damage was reported.

TOKYO, MAY 23 -(AP)- A severe 10-minute earthquake shook northeastern Honshu, main island of Japan, starting at 4:19 P.M. (2:19 A.M., EST) today, with considerable property damage. No casualties were reported. Train service about FUKUSHIMA, 150 miles north of Tokyo, was suspended because of road-bed displacement. Elsewhere walls were cracked, some roofs fell and windows were broken.

MANILA, MAY 23 -(AP)- A sharp earthquake shook a major portion of Luzon Island at 4:30 P.M. (#:30 A.M., EST) today. No damage or casualties were reported.

June

MANILA, JUNE 7 -(AP)- Mayon Volcano, in a turbulent mood after a 10-year nap, bellowed angrirly tonight. Homes of more than 16,000 villagers stood vacant near the base of the great mountain, their inhabitants having sought safety in the country and towns distant from Mayon, Libog, a town of 7,000 was deserted. Earthquakes which accompanied eruptions the first five days, ceased today and the period between bursts of flames, lava and smoke from the crater lengthened to nearly five hours. Earlier the eruptions came at 30-minute intervals. Their intensity decreased. At nightfall, the 7,900 foot peak 200 miles southeast of Manila wore a plume of smoke a mile and a half high. Flashes of flame split the dark pillar at frequent intervals. Lava rolled slowly down the mountain. Over the three provinces forming the southeastern tip of Luzon Island, the largest in the archipelago, ashes floated in the air.

MEXICO CITY, JUNE 10 -(AP)- A slight earthquake was felt in some sections of Mexico City today, but there was no damage.

BRUSSELS, JUNE 11 -(AP)- A sharp earthquake considered the severest in the nations History today tumbled chimneys, cracked walls and frightened the populace throughout Belgium. Shocks lasting ten to 20 seconds were reported from all parts of the nation. Numerous persons were cut by flying glass. A dull rumbling accompanied the shocks. The Brussels observatory was jarred out of order

LONDON, JUNE 11 -(AP)- Sharp earth shocks were felt today in central London and in Brussels. No serious damage was reported.

BRUSSELS, JUNE 12 -(AP)- A new earthquake, considerably weaker than that which jolted a corner of Europe from England to the Rhineland yesterday, was recorded today in Belgium. The tremor lasted three seconds.

Although yesterday's disturbance was felt in four other nations - England, France, Germany and the Netherlands- Belgium suffered most severely with the death of three persons and injury of about 20 attributed to the shocks. There was scattered damage to buildings in Belgium and southern France.

LONDON, JUNE 15 -(AP)- Slight earth tremors rattled furniture in central London today for the second time in five days. Shocks were recorded at 2:35 and 2:40 P.M. (3:35 and 8:40 A.M., EST). No damage was reported. Previous shocks occurred Saturday.

SANTIAGO, CHILE, JUNE 15 -(AP)- A strong earth shock was felt all along Chile's coast at 3:45 A.M. today. The temblor was strongest around VALPARAISO. It also was felt at IQUIQUE, ANTOFAGASTA and COPIAPO. No reports of damage have been received.

MEXICO CITY, JUNE 20 -(AP)- A slight earthquake was felt tonight at COATEPEC, Vera Cruz state, according to dispatches received here. No damage was reported. The quake started at 9:00 P.M.,EST and lasted but a few seconds.

ATHENS, JUNE 21 -(AP)- A severe earthquake shook parts of Greece today. Old buildings collapsed at GALAXIDI, on the Gulf of Corinth, 100 miles westnorthwest of Athens. Thus far loss of life has not been reported. Shocks were felt at such widely separated points as TREVEZA, in EPIRUS, and the Island of SAMOS, just off the Asia Minor coast.

MOSCOW, JUNE 21 -(AP)- Strong earthquakes during the night around lake Issyk Kul, in Kirghizia, Soviet Middle Asia, were reported tonight. The first shock was at 11:51 P.M., GMT June 20 (6:51 P.M., EST). Lasting one minute, it cracked

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buildings and stopped clocks at FRUENZE, capital of KITGHIZIA, where the tremor was recorded as the strongest in ten years. A second shock was felt five minutes later. A number of buildings were reported destroyed in two villages in the TIEN SHAN MOUNTAIN region, along the border between the Soviet Union and China, where tremors were felt for three minutes.

SANTIAGO, CHILE, JUNE 25 -(AP)- Prolonged, strong earth shocks were reported today from COQUIMBO, Chilean seaport, and the village of LA SERENA, a copper mining center in the same province. There was no known damage.

MEXICO CITY, JUNE 28 -(AP)- Mexico City was rocked by a heavy earthquake today at approximately 1:25 P.M. (2:25 P.M., EST). Reports of damage or casualties were not immediately available.

August

LOS ANGELES , AUG. 30 -(AP)- A strong earthquake shook Los Angeles at 7:21 (PST) tonight. The shock, a swaying east-west motion lasting several seconds, was felt in downtown Los Angeles and more heavily in the harbor district and beach cities. No damage was reported.

September

EUREKA, CALIFORNIA, SEPT. 12 -(AP)- A moderate earthquake was felt over the Humboldt Bay area shortly after 10 o'clock last night. No damage was reported.

October

SIOUX FALLS, S.D., OCT. 11 -(AP)- A sharp earth tremor jarred Sioux Falls early this morning but caused no damage. Residents reported a "rumble like thunder" from the heavy initial shock which was followed by a series of lighter motions. Estimates of the duration of the shock ranged from 10 to 20 seconds.

Sharp tremors also were reported at HUDSON, BERESFORD, SPENCER, HURLBOLDT and a dozen nearby towns south and west of here. Light earth shocks were reported at CHAMBERLAIN and WESSINGTON SPRING last week.

November

TOKYO, NOV. 5 -(AP)- An earthquake jarred Tokyo today but no damage or casualties were reported.

TOKYO, NOV.7 -(AP)- The fifth earthquake in three days shook Tokyo today. All were of mild intensity and caused no casualties or serious damage. The last shock was felt here at 10:45 A.M. today (8:45 P.M., EST, Nov.6) Minor landslides temporarily halted traffic on two railroads and one warehouse collapsed.

VIENNA, NOV. 8 -(AP)- Numerous houses of villages southeast of Vienna were damaged today by an earthquake lasting ten seconds. Damage in Vienna was slight.

HONOLULU, NOV.10 -(AP)- Lieut. Commander J.H.Peters of the U.S.Coast and Geodetic Survey, reported the Honolulu harbor water level rising late today at a rate of three-quarters of a foot every 20 minutes following a severe earthquake, apparently centered near the Aleutian Islands.

Maui Island, southwest of Oahu, on which Honolulu is situated, reported a two and one-half foot rise above normal at 3:05 P.M. (8:35 P.M., EST) following an 18 inch drop below normal.

Commander Peters said the rise in Honolulu harbor started at 3 P.M. (8:30 P.M. EST) about five hours after the first shocks were recorded.

ANCHORAGE, ALASKA, NOV. 10 -(AP)- Light earthquake shocks were felt here at 10:25 A.M. (3:25 P.M.,EST) today, and the Woodley Airways radio station received a report of a severe quake at Naknek station on BRISTOL BAY. The shocks here had an east-west swaying motion, gentle but noticeable.

TOKYO, NOV. 16 -(AP)- An earthquake of moderate intensity shook eastern and central Japan tonight. Early reports told of no damage.

UNALASKA, ALASKA, NOV. 28 -(AP)- An earthquake of 20 seconds duration shook buildings at 9:29 P.M. (PST) last night in Unalaska and vicinity. No damage was reported.

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# SEISMOLOGICAL DESPATCHES

## GEORGETOWN UNIVERSITY

## WASHINGTON, D. C.

The Seismological Despatches are excerpts taken with as few alterations as possible from the special dispatches received at Georgetown as showing date, place, time, duration, character of motion, region affected extent of damage in various regions and to various structures, and other circumstances of scientific interest. Earlier dispatches are replaced by later ones when the latter correct the former, but the evidence is kept strictly non-instrumental, no corrections being applied in view of subsequent information derived from instrumental sources. The times are given as received, no attempt being made to conjecture whether Eastern Standard Time or some other time is being used. When the day of the week is given, the day of the month is inserted. Press dispatches of instrumental reports, cited opinions of seismologists, geologists and others (except as witnesses), historical backgrounds, geological and scientific collateral information, political and human interest coloring matter, all of which forms a large bulk of the dispatches, are deleted as far as possible, making the necessary grammatical changes.

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YEAR 1937

January

ASBURY PARK, NEW JERSEY, JANUARY 8 -(AP)- A tremor, apparently a slight earthquake shook this area today. Furniture was moved, but apparently no damage was done.

HILO, HAWAII, JANUARY 11 -(AP)- An earthquake was felt strongly at 10:55 last night (4:25 A.M., E.S.T., Jan. 11) by Hilo residents. It was believed to have originated in the Kilauea volcano region.

TOKYO, JANUARY 23 -(AP)- An earthquake stopped clocks and toppled household articles to the floor in Eastern Japan today. No casualties or serious damage were reported.

CHILPANCINGO, MEXICO, JANUARY 26 -(AP)- An earthquake continuing for ten seconds today rang church bells here and cracked walls and roofs of several buildings.

FUKUOKA, JAPAN, JANUARY 28 (Thursday)-(AP)- Strong Earthquakes threw the populace of Northern KYUSHU ISLAND into panic today in widely scattered areas. The epicenter of the tremors, first felt at 9 44 A.M. today (Thursday) (7:44 P.M., E.S.T Wednesday), was reported west of MOUNT SAO, an active volcano.

February

HILO, HAWAII, FEBRUARY 1 -(AP)- Two strong earthquakes in less than 24 hours were felt on Hawaii Island. No damage was reported. The first, at 7:54 last night (1:04 A.M., E.S.T., Feb.1) shook the entire island. Its origin was believed to be 50 miles westward of the HUALALAI crater, one time volcano. The other quake was vigorous in the KONA section in the western part of the island, and less so in the rest of the island. It was at 12:23 A.M., today (5:53 A.M., EST).

SAN SALVADOR, SALVADOR, FEBRUARY 7 -(AP)- The National Observatory reported tonight a light temblor was felt in ZACATECOLUCA, Capital of the Province of LA PAZ. Neither damage nor casualties were reported.

WALLA WALLA, WASHINGTON, FEBRUARY 8 -(AP)- An earth tremor, with rumbling noise, was reported in the FERNDALE district on the Oregon side of Walla Walla, six miles south of here, at 12:16 P.M. today. No damage was reported.

March

GUAYAQUIL, ECUADOR, MARCH 2 -(AP)- A strong earth tremor was felt today in the City of LATACUNGA, capital of the Province of LEON. No damage or casualties were reported.

COLUMBUS, OHIO, MARCH 2 -(AP)- An upthrusting rock crust in the old glacial region of Northwest Ohio caused earth tremors today from the Canadian border south into KENTUCKY. Five states recorded the movement. No injuries were reported.

Some plate-glass windows were broken, chimneys toppled and plaster knocked from walls in WEAKONETA. From as far north as Windsor, ONTARIO, across the border from DETROIT, to LOUISVILLE, Ky., on the south, residents reported quivering walls and other like phenomena. INDIANA, MICHIGAN and WEST VIRGINIA were included in the area. COLUMBUS, DAYTON, ZANESVILLE, SPRINGFIELD, LIMA, AKRON, TOLEDO, CANTON, FINDLAY and many other points in Ohio reported upset furniture and swaying homes.

SALINAS, CALIFORNIA, MARCH 5 -(AP)- A sharp earthquake was felt here at 4:30 A.M. today. No damage was reported.

SANTIAGO, CHILE, MARCH 6 -(AP)- A strong earth tremor, perceptible for four seconds, was felt here at 9:20 P.M., EST. First reports made no mention of damage or casualties.

SAN FRANCISCO, MARCH 8 -(AP)- Residents of the San Francisco Bay region were shaken from sleep by an earthquake at 2:32 A.M. today, which knocked articles from shelves in EASTBAY cities.

Police at ALBANY and the sheriff's office in MARTINEZ said the movement there was the sharpest they had felt since the 1906 San Francisco disaster. Street lights were put out of commission in some EASTBAY sections. One resident of RICHMOND reported he was shaken out of his chair. The earthquake, which lasted

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two or three seconds. came with a rolling motion in San Francisco and jolting shocks in the Eastbay.

A check by OAKLAND police indicated principal damage was in stores, where stock was tumbled from shelves. Three windows were broken in a large BERKELEY market.

ST. THOMAS, ONTARIO, MARCH 9 -(CANADIAN PRESS)- A distinct earth shock was felt here at 12:45 A.M., today. No damage from the tremor was reported.

CHICAGO, MARCH 9 -(AP)- Shortly before midnight, a series of tremors were distinctly felt, but caused negligible damage in OHIO, INDIANA, KENTUCKY, ILLINOIS, WEST VIRGINIA, MICHIGAN, WISCONSIN and ONTARIO, CANADA.

CHICAGO residents told of vibratory shocks. Buildings were shaken in CLEVELAND, COLUMBUS and other Ohio cities. At ANNA, Ohio, chimneys toppled by the quake of last Tuesday and since repaired, were felled by the shocks of last night

TALTAL, CHILE, MARCH 14 -(AP)- An earthquake at 7:50 A.M. today sent Taltal's population scurrying into the streets in a panic. There were no casualties but a number of buildings were damaged partially and several old walls collapsed. Communications with the interior were interrupted.

RENO, NEVADA, MARCH 17 -(AP)- Light earthquake shock was felt here at 5:19 A.M. (8:19 A.M. EST) today. No damage was report d.

LOS ANGELES, MARCH 25 -(AP)- Southern California shook this morning with a heavy earthquake.

Los Angeles and its environs were swayed by a long and continuously increasing motion. LONG BEACH reported it was quite unlike the heavy 1933 shock, which came as a jolt. Today's movement was a sort of rythmic shimmy, with an East West motion.

Buildings shook in downtown Los Angeles, GLENDALE, SANTA MONICA and ANAHEIM reported the strong tremor immediately, but observers said it was not enough to cause damage in those areas. SAN DIEGO felt it as a sharp quake. At EL CENTRO the jolt was heavy but no immediate damage was reported. WARNER SPRINGS reported that the quake was strongly felt but that no damage was caused.

In RIVERSIDE the quake was felt sharply, and at HEMET and SAN JACINTO, near there, crockery rattled. Today's shock was the heaviest experienced there since 1918. COLTON, about 50 miles east of Los Angeles, reported that dishes rattled and chandeliers swung, but there was no damage

April

RIVERSIDE, CALIFORNIA, APRIL 20 -(AP)- A light earthquake was felt here at 7:25 A.M. today. The movement was so slight that many residents did not notice it. HEMET and SAN JACINTO also reported feeling the tremor.

June

LISBON, PORTUGAL, JUNE 30 -(AP)- A violent earth tremor was reported to have shaken AGRA/HEROISMO, in the AZORES, today, spreading panic through the population. No casualties were reported.

July

SAN FRANCISCO, JULY 18 -(AP)- A 20-second earthquake awakened many San Franciscans at 3:59 A.M. today but no damage was reported.

NEW YORK, JULY 19 -(AP)- Many residents of LONG ISLAND complained last midnight their homes had trembled for three minutes

FAIRBANKS, ALASKA, JULY 22 -(AP)- Frame buildings swayed and merchandise tumbled to floors as a strong earthquake struck Fairbanks and the Alaskan interior today.

The quake began about 7:09 A.M. (12:09 P.M., EST) and lasted more than a minute. Tremors were re-current throughout the day. A second severe shock came at 7:55 A.M., a third at 8:01. A stronk quake at 3:53 P.M. (8:53 P.M. EST) broke stock in the liquor stores and various drug stores. The shock was also reported at HOT SPRINGS and TANANA.

FAIRBANKS, ALASKA, JULY 23 -(AP)- For nine hours yesterday many shocks, four of them severe, occurred over the interior from Fairbanks, 300 miles south, to

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ANCHORAGE. Telephone lines broken during the first shocks were hastily repaired. Total damage was estimated at a maximum of $5,000, mostly to the liquor store stock. An unconfirmed report said several houses were demolished and one person injured when a giant earth slide swept across 2,000 feet of the Richardson Highway.

The U.S. Weather Bureau said the shocks were more severe south of here along the highway, which was cracked in some places from four to 12 inches. The Bureau said the disturbance was "greatest on record."

FAIRBANKS, ALASKA, JULY 24 -(AP)- Earth tremors were felt in the vicinity of Fairbanks again today.

KING COVE, ALASKA, JULY 25 -(AP)- Mount Pavlov, one of the most active volcanoes on the Alaska Peninsula, spread a thin layer of ash over this region today. The ash settled as far distant as 50 miles from the peak. Residents said several slight earthquakes have been felt recently, but no damage was reported.

MEXICO CITY, JULY 25 -(AP)- A slight earthquake tremor tonight at 9:50 (10:50 EST) frightened theatre patrons and others but did no apparent damage. The shock lasted for several seconds.

MEXICO CITY, JULY 26 -(AP)- A heavy earthquake shook much of central Mexico last night and disrupted communication lines today prevented a survey of the damage.

VERA CRUZ CITY reported two dead and several buildings collapsed. Unconfirmed reports listed casualties at JALAPA and other towns northwest of Vera Cruz.

EL CENTRO, CALIFORNIA, JULY 26 -(AP)- A minor earthquake was felt in El Centro at 11:37 o'clock last night but no damage was reported.

August

SHANGHAI, AUGUST 1 -(AP)- Reports from Hsuchow, in the Province of Kiangsu, today said an earthquake last night killed 20 persons and destroyed houses. The quake was felt slightly at TIENTSIN.

PONTA DELGADA, AZORES, AUGUST 2 -(AP)- An earthquake was felt today in SAN ROQUE parish, island of ST. MICHAEL. The only damage reported was collapse of several walls.

LONG BEACH, CALIFORNIA, AUGUST 16 -(AP)- Residents of this city reported a sharp earth shock at 9:02 o'clock (PST) tonight. No damage was caused.

MANILA, P.I., AUGUST 20 -(AP)- Two sharp earthquakes threw Manila into darkness tonight. Many fires were started by the shocks, the worst in 40 years. Several large buildings and a number of churches were damaged. Other major structures swayed noticeably. Many injuries but no deaths were reported during the confusion following the first shock about 8 P.M. The second tremor added new terror 20 minutes later. The shocks were felt at least 200 miles away.

FAIRBANKS, ALASKA, AUGUST 22 -(AP)- A strong earthquake was felt here at 6:03 A.M. today (11:03 A.M., EST) but no damage was reported. The quake followed several lesser shocks beginning at 6:26 o'clock last night.

September

PONCE, PUERTO RICO, SEPTEMBER 6 -(AP)- A fairly strong earthquake was felt here today but, so far as could be determined, there was no damage.

SANTIAGO, CUBA, SEPTEMBER 19 -(AP)- A strong earthshock was felt here today at 4:10 P.M., EST. It caused a panic among residents, but no damage was reported.

BATAVIA, JAVA, SEPTEMBER 27 -(AP)- Two were killed and one injured today in a severe earthquake which shook eastern and central Java. There was widespread property damage. Many roofs and walls, and in some cases whole houses, collapsed. There was considerable property damage at JOKJOKARTA, on the southern coast, but no loss of life was reported.

TOKYO, SEPTEMBER 29 -(AP)- A moderate but lengthy earthquake shook a wide area of Japan this morning. No deaths and no damage were reported. The quake affected

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the cities of TOKYO and YOKOHAMA and NORTHEASTERN and CENTRAL HONSHU PREFECTURE.

SAN SALVADOR, EL SALVADOR, SEPTEMBER 29, -(AP)- A strong earth temblor was felt here today, and at the same time the volcano Santa Ana in northern El Salvador became active.

MANILA, SEPTEMBER 30 (Thursday) -(AP)- Three earthquakes of moderate intensities were felt in Manila the past 24 hours. There were no reports of casualties or damage. Two shocks occurred yesterday morning and the third this morning.

October

MEXICO CITY, OCTOBER 6 -(AP)- An earthquake today shook wide areas in GUERRERO, PUEBLA and VERA CRUZ, dispatches indicated. Reports of damage were not given immediately. Buildings were shaken, dishes fell and many persons were awakened from their early morning sleep here. All telegraph lines in Guerrero escaped damage. CHILPANCINGO, capital of Guerrero, reported strong vibratory shocks.

TOKYO, OCTOBER 17 -(AP)- An earthquake of heavy intensity rocked Tokyo at 1:50 P.M. (11:50 P.M., Oct.16, EST). The extent of damage was not known immediately.

MENDOZA, ARGENTINA, OCTOBER 19 -(AP)- A slight earthquake was reported today in the Andes Mountains about 60 miles west of here. Tremors were felt in numerous villages, but no damage was reported.

SIMLA, INDIA, OCTOBER 20 -(AP)- A severe earthquake jarred the Simla hills today. Chimneys toppled and roofs collapsed on houses over a wide area of the interior. The shock was felt in DELHI. Damage was slight.

HILO, HAWAII, OCTOBER 25 -(AP)- A strong earthquake shook Hilo and volcano areas at 5:43 A.M. (11:13 A.M., EST today. It was believed to have originated in the Maunaloa volcano.

November

WATSONVILLE, CALIFORNIA, NOVEMBER 10 -(AP)- A sharp earthquake was felt here at 9:29 A.M., (EST) today but no damage was reported.

OLYMPIA, WASHINGTON, NOVEMBER 11 -(AP)- Two brief earth shocks were felt here at 11:25 A.M. (EST) today. No damage was reported.

PALM SPRINGS, CALIFORNIA, NOVEMBER 16 -(AP)- Residents of this winter resort were awakened at 4:30 A.M., (PST) today by two sharp earthquakes which shook furniture, rattled windows and dishes but apparently caused no material damage.

CARLIN, NEVADA, NOVEMBER 18 -(AP)- An earth shock which lasted about 10 seconds was felt here at 4:53 P.M. (7:53 P.M., EST) but no serious damage was reported.

HELENA, MONTANA, NOVEMBER 27 -(AP)- A light earthquake, which lasted about two seconds, was felt here at 7:12 P.M. (9:12 P.M., EST) tonight. No damage was reported.

December

MEXICO CITY, DECEMBER 23 -(AP)- A heavy earthquake shook Mexico City and most of southern Mexico today from nine seconds to more than five minutes. Three persons were known dead.

A survey of the capital showed the walls of many buildings with gaping cracks, sidewalks and streets with large crevices and a few water mains broken. One aged woman was killed here when the roof of her adobe house fell in and crushed her. Two men were electrocuted by broken high tension wires.

A dispatch from CHILPANCINGO said the quake lasted five minutes there. Workmen, suspended in slings to repair the tower of a parochial church, screamed in fright as it rocked back and forth ringing the bells.

Duration of the principal shock in Mexico City was 52 seconds, but lesser tremblings continued for some time. The business section of Mexico City was almost undamaged. Dispatches from southern states said several houses had collapsed as well as many walls and fences.

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SAN SALVADOR, SALVADOR, DECEMBER 27 -(AP)- One person was killed and five were injured in an earthquake that shook the towns of AHAUCHAPAN and ATUQUIZAYA near the Guatemalan border last night. Considerable property damage was reported in both towns and the shock disrupted electric light and telegraph services. Less severe earthquakes had been felt since Christmas night. No unusual volcanic activity was reported but the region is packed with small volcanic craters. (Dispatches from Guatemala said three persons were killed in the Salvador quake and 20 houses destroyed).

MEXICO CITY, DECEMBER 31 -(AP)- An earthquake of moderate intensity jarred Mexico city at 11:44 today

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