

**AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.**

**KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.**

**SEISMOLOGICAL BULLETIN FOR JANUARY 1948**

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD $T_1$ | PENDULUM FREE PERIOD $T$ | DAMPING CONSTANT $\mu^2$ | $\frac{Ak}{\pi l}$    |
|------------|----------------------------------|--------------------------------|--------------------------|--------------------------|-----------------------|
| N.         | 1940 Nov. 29                     | 24.5 <sup>sec</sup>            | 8.2 <sup>sec</sup>       | 0.00                     | 74.3 <sup>sec-1</sup> |
| E.         | 1940 Nov. 27                     | 24.0                           | 8.0                      | 0.00                     | 81.5                  |
| Z.         | 1940 Dec. 14                     | 14.4                           | 14.2                     | 0.00                     | 75.9                  |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT. | PHASE.                | G.M.T.                                       | PERIOD. | AMPLITUDE. | $\Delta$ | REMARKS.                                                             |
|-------|--------|-----------------------|----------------------------------------------|---------|------------|----------|----------------------------------------------------------------------|
| 1     | NE     | eL<br>F               | 06 <sup>h</sup> 57 <sup>m</sup> -<br>07 00 - | sec.    | $\mu$      | km.      |                                                                      |
| 4     | ZN     | iPKP <sub>1</sub>     | 09 15 17                                     |         |            | 16500    | Dilatation. Focal depth about 600K<br>} Short period vertical instr. |
|       | Z      | i                     |                                              |         |            |          |                                                                      |
|       | ZE     | i(PKP <sub>2</sub> )  |                                              |         |            |          |                                                                      |
|       | ZN     | iPKP <sub>1</sub>     | 17 40                                        |         |            |          |                                                                      |
|       | Z      | i(PKP <sub>2</sub> )  |                                              |         |            |          |                                                                      |
|       | N      | e(SK <sub>P</sub> )   | 18 22                                        |         |            |          |                                                                      |
|       | Z      | esPKP <sub>1</sub>    |                                              |         |            |          |                                                                      |
|       | ZN     | e(sPKP <sub>2</sub> ) |                                              |         |            |          |                                                                      |
|       |        | -(PP)                 |                                              |         |            |          |                                                                      |
|       | ZN     | e(pPP)                | 21 16                                        |         |            |          |                                                                      |
|       | N      | e(SK <sub>S</sub> )   |                                              |         |            |          |                                                                      |
|       | N      | e(sPP)                | 22 10                                        |         |            |          |                                                                      |
|       | E      | e(PPP)                |                                              |         |            |          |                                                                      |
|       | ZE     | e(SK <sub>K</sub> S)  | 24 18                                        |         |            |          |                                                                      |
|       | N      | e(pPPP)               |                                              |         |            |          |                                                                      |
|       |        | -(pSK <sub>S</sub> )  |                                              |         |            |          |                                                                      |
|       | E      | e(SK <sub>S</sub> P)  | 27 (52)                                      |         |            |          |                                                                      |
|       | N      | e(PS <sub>K</sub> S)  | 28 (50)                                      |         |            |          |                                                                      |
|       | E      | e(SPP)                | 30 48                                        |         |            |          |                                                                      |
|       | Z      | e(pPS)                |                                              |         |            |          |                                                                      |
|       |        | -(PSP)                | 31 24                                        |         |            |          |                                                                      |
|       | N      | e(PPS)                |                                              |         |            |          |                                                                      |
|       |        | -(PSP)                | 32 (16)                                      |         |            |          |                                                                      |
|       | E      | e(sPS)                |                                              |         |            |          |                                                                      |
|       |        | -(sSP)                |                                              |         |            |          |                                                                      |
|       | ZNE    | ess                   | 37 (20)                                      |         |            |          |                                                                      |
|       | NE     | esss                  | 40 (50)                                      |         |            |          |                                                                      |
|       | E      | esss                  | 43 (15)                                      |         |            |          |                                                                      |
|       |        | F                     | 10 00 -                                      |         |            |          |                                                                      |
| 4     | ZNE    | eL<br>F               | 13 27 -<br>30 -                              |         |            |          |                                                                      |
| 5     | ZNE    | eL<br>F               | 23 41 -<br>50 -                              |         |            |          |                                                                      |

M.O. 502

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SEISMOLOGICAL BULLETIN.

JANUARY 1948

| DATE. | COMPT. | PHASE. | G.M.T. |    |      | PERIOD. | AMPLI-<br>TUDE. | Δ      | REMARKS.                                                  |
|-------|--------|--------|--------|----|------|---------|-----------------|--------|-----------------------------------------------------------|
|       |        |        | h.     | m. | s.   |         |                 |        |                                                           |
| 6     | ZNE    | iP     | 17     | 35 | (41) |         |                 | 9300   | Compression<br>In minute time-break                       |
|       | ZNE    | ePP    |        | 38 | (59) |         |                 |        |                                                           |
|       | ZNE    | ePPP   |        | 41 | (14) |         |                 |        |                                                           |
|       | ZNE    | eS     |        | 46 | 07   |         |                 |        |                                                           |
|       | N      | e(ScS) |        |    | 29   |         |                 |        |                                                           |
|       | Z      | e(PS)  |        | 47 | 07   |         |                 |        |                                                           |
|       | E      | e(SS)  |        | 51 | 19   |         |                 |        |                                                           |
|       | N      | e(SSS) |        | 54 | (29) |         |                 |        |                                                           |
|       | E      | M      | 18     | 17 | 54   | 16      | +12             |        |                                                           |
|       | Z      | M      |        | 18 | 52   | 16      | -13             |        |                                                           |
|       |        | F      | 19     | 40 | -    |         |                 |        |                                                           |
| 7     | NE     | eL     | 16     | 09 | -    |         |                 |        |                                                           |
|       |        | F      |        | 40 | -    |         |                 |        |                                                           |
| 10    | ZNE    | e      | 05     | 41 | (42) |         |                 |        | Preliminary phases con-<br>fused with microseisms         |
|       | Z      | e      |        | 46 | (42) |         |                 |        |                                                           |
|       | E      | e      |        | 51 | (32) |         |                 |        |                                                           |
|       | NE     | e      |        | 56 | (27) |         |                 |        |                                                           |
|       | ZNE    | e      | 06     | 02 | (02) |         |                 |        |                                                           |
|       |        | F      | 07     | 45 | -    |         |                 |        |                                                           |
| 16    | Z      | e(P)   | 11     | 20 | 44   |         |                 | (8200) | Weak pulses                                               |
|       | NE     | e(S)   |        | 30 | (16) |         |                 |        |                                                           |
|       | NE     | e(SS)  |        | 35 | (06) |         |                 |        |                                                           |
|       | NE     | e(L)   |        | 40 | -    |         |                 |        |                                                           |
|       |        | F      | 12     | 30 | -    |         |                 |        |                                                           |
|       |        |        |        |    |      |         |                 |        |                                                           |
| 17    | ZNE    | eL     | 02     | 38 | -    |         |                 |        |                                                           |
|       |        | F      | 03     | 00 | -    |         |                 |        |                                                           |
| 17    | ZNE    | eL     | 07     | 29 | -    |         |                 |        |                                                           |
|       |        | F      | 09     | 30 | -    |         |                 |        |                                                           |
| 20    | NE     | eL     | 11     | 10 | -    |         |                 |        |                                                           |
|       |        | F      | 13     | 00 | -    |         |                 |        |                                                           |
| 22    | NE     | e(L)   | 14     | 30 | -    |         |                 |        |                                                           |
|       |        | F      | 15     | 30 | -    |         |                 |        |                                                           |
| 23    | ZNE    | eL     | 15     | 00 | -    |         |                 |        |                                                           |
|       |        | F      |        | 20 | -    |         |                 |        |                                                           |
| 24    | ZNE    | eP     | 18     | 00 | (31) |         |                 | 11200  | Compression.Destructive in<br>Phillipines.<br>Clear pulse |
|       | NE     | iSKS   |        | 11 | 11   |         |                 |        |                                                           |
|       | Z      | eS     |        |    | 58   |         |                 |        |                                                           |
|       | ZNE    | iPS    |        | 13 | 35   |         |                 |        |                                                           |
|       | NE     | eSS    |        | 19 | 05   |         |                 |        |                                                           |
|       | E      | M      |        | 50 | (33) | 19      | ≥-1043          |        |                                                           |
|       | Z      | M      |        | 51 | (11) | 25      | ≥+1280          |        |                                                           |
|       | N      | M      |        | 52 | (19) | 17      | ≥+948           |        |                                                           |
|       |        | F      | 23     | 30 | -    |         |                 |        |                                                           |
|       |        |        |        |    |      |         |                 |        |                                                           |
| 25    | ZNE    | eL     | 06     | 50 | -    |         |                 |        |                                                           |
|       |        | F      | 07     | 20 | -    |         |                 |        |                                                           |

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|-------|--------|---------|--------|--------------------------------|------|---------|-----------------|---------|------------------------------|
|       |        |         | h.     | m.                             | s.   | sec.    | μ.              | km.     |                              |
| 26    | ZNE    | e       | 15     | 05                             | 02   |         |                 |         |                              |
|       | N      | i       |        | 07                             | 41   |         |                 |         |                              |
|       | E      | e       |        | 08                             | 12   |         |                 |         |                              |
|       | Z      | i       |        |                                | 25   |         |                 |         |                              |
|       | Z      | M       |        | 13                             | 10   | 20      | -102            |         |                              |
|       | N      | M       |        |                                | 35   | 20      | -68             |         |                              |
|       | E      | M       |        | 14                             | 37   | 18      | -35             |         |                              |
|       |        | F       | 16     | 00                             | -    |         |                 |         |                              |
| ✓ 27  | Z      | i(PKP)  | 12     | 17                             | 08   |         |                 | (13000) | Dilatation                   |
|       | ZNE    | i       |        |                                | 13   |         |                 |         |                              |
|       | Z      | e(PP)   |        | 18                             | (19) |         |                 |         |                              |
|       | ZN     | e(PKS)  |        | 20                             | 35   |         |                 |         | Strong clear pulse           |
|       | ZN     | e(SKS)  |        | 23                             | 58   |         |                 |         |                              |
|       | N      | e(SKS)  |        | 25                             | 07   |         |                 |         |                              |
|       | N      | e(PS)   |        | 27                             | 53   |         |                 |         |                              |
|       | N      | e(PKKS) |        | 31                             | (34) |         |                 |         |                              |
|       | ZN     | e(SS)   |        | 34                             | (19) |         |                 |         |                              |
|       | E      | e(SSS)  |        | 39                             | (09) |         |                 |         |                              |
|       | Z      | M       |        | 56                             | 13   | 12      | +12             |         |                              |
|       |        | F       | 14     | 30                             | -    |         |                 |         |                              |
| 27    | ZN     | eL      | 18     | 50                             | -    |         |                 |         |                              |
|       |        | F       | 19     | 15                             | -    |         |                 |         |                              |
| ✓ 28  | ZE     | i       | 04     | 16                             | (49) |         |                 |         | In minute time-break         |
|       | N      | e       |        | 21                             | (09) |         |                 |         |                              |
|       | N      | e       |        | 22                             | (03) |         |                 |         |                              |
|       | N      | M       |        | 47                             | 23   | 22      | +25             |         |                              |
|       | E      | M       |        | 51                             | 33   | 18      | +11             |         |                              |
|       | Z      | M       |        | 52                             | 23   | 12      | -10             |         |                              |
|       |        | F       | 05     | 30                             | -    |         |                 |         |                              |
| ✓ 28  | ZE     | i(P)    | 16     | 00                             | 10   |         |                 | (5400)  | Short period vertical instr. |
|       | NE     | e(PP)   |        | 01                             | 44   |         |                 |         | No Galitzin Z                |
|       | E      | e(S)    |        | 07                             | 10   |         |                 |         |                              |
|       | E      | e(SS)   |        | 10                             | 10   |         |                 |         |                              |
|       | NE     | e(LQ)   |        | 11                             | -    |         |                 |         |                              |
|       | N      | M       |        | 21                             | 59   | 20      | +48             |         |                              |
|       | E      | M       |        | 25                             | 06   | 16      | +70             |         |                              |
|       |        | F       | 17     | 30                             | -    |         |                 |         |                              |
| 29    | NE     | eL      | 01     | 28                             | -    |         |                 |         | No Galitzin Z                |
|       |        | F       |        | 40                             | -    |         |                 |         |                              |
| 30    | ZE     | iP      | 08     | 53                             | 22   |         |                 | 6200    | Compression                  |
|       | ZE     | iPcP    |        | 54                             | 19   |         |                 |         |                              |
|       | ZE     | ePP     |        | 55                             | 39   |         |                 |         |                              |
|       | ZE     | ePPP    |        | 56                             | (32) |         |                 |         |                              |
|       | NE     | iS      | 09     | 01                             | (07) |         |                 |         |                              |
|       | Z      | i       |        |                                | (27) |         |                 |         |                              |
|       | NE     | eScS    |        | 03                             | (12) |         |                 |         |                              |
|       | E      | eSS     |        | 05                             | -    |         |                 |         |                              |
|       | NE     | eLQ     |        | 07 <sup>1</sup> / <sub>2</sub> | -    |         |                 |         |                              |
|       | N      | eLr     |        | 10                             | -    |         |                 |         |                              |
|       | Z      | i(PKKP) |        | 15                             | 03   |         |                 |         |                              |
|       | N      | M       |        | 24                             | 55   | 20      | -88             |         |                              |
|       | E      | M       |        | 25                             | 15   | 16      | -52             |         |                              |
|       | Z      | M       |        |                                | 26   | 16      | -54             |         |                              |
|       |        | F       | 11     | 00                             | -    |         |                 |         |                              |

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|-------|--------|-----------|--------|----------|--------|---------|-----------------|-----|----------|
|       |        |           | h.     | m.       | s.     |         |                 |     |          |
|       |        |           |        |          |        | sec.    | μ               | km. |          |
| 31    | Z      | e(L)<br>F | 07     | 50<br>55 | -<br>- |         |                 |     |          |
| 31    | NE     | e(L)<br>F | 14     | 45<br>50 | -<br>- |         |                 |     |          |
| 31    | NE     | e(L)<br>F | 17     | 43<br>45 | -<br>- |         |                 |     |          |

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

25 MAR 1941  
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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

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Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

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|------------|----------------------------------|--------------------------------|--------------------------|--------------------------|------------------------|
| N.         | 1940. Nov. 29                    | 24.5 <sup>sec.</sup>           | 8.2 <sup>sec.</sup>      | 0.00                     | 74.3 <sup>sec.-1</sup> |
| E.         | 1940. Nov. 27                    | 24.0                           | 8.0                      | 0.00                     | 81.5                   |
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|-------|--------|-------------------|--------|------|------|---------|-------------|--------------|-----------------------------------------------|
|       |        |                   | h.     | m.   | s.   | sec.    | $\mu$       | km.          |                                               |
| 4     | Z      | 1(P)              | 04     | 56   | 56   |         |             | About 8500?  | Short period vertical inst. No Gal.Z.         |
|       | N      | e(L)              | 05     | 23   | -    |         |             |              | Max. about 05.29½ -.                          |
|       |        | F                 | 06     | 00   | -    |         |             |              | Confused by microseisms.                      |
| 6     | NE     | e(L)              | 11     | 02   | -    |         |             |              |                                               |
|       |        | F                 |        | 10   | -    |         |             |              |                                               |
| 6     | NE     | e                 | 23     | 09   | 56   |         |             |              | Weak pulse                                    |
|       | NE     | e(L)              |        | 15   | -    |         |             |              |                                               |
|       | ZNE    | e(L)              |        | 20   | -    |         |             |              |                                               |
|       |        | F                 |        | 45   | -    |         |             |              |                                               |
| 9     | NE     | e(L)              | 06     | 12   | -    |         |             |              |                                               |
|       |        | F                 |        | 15   | -    |         |             |              |                                               |
| 9     | ZNE    | 1P                | 13     | 03   | 44   |         |             | 2900         | Dilatation. Strong pulse. Azimuth (SE).       |
|       | NE     | 1PP               | 04     | 38   |      |         |             |              | 35.5°N, 27.2°E (U.G.G.I.)                     |
|       | NE     | 1P <sub>0</sub> P | 06     | (46) |      |         |             |              | In minute time break.                         |
|       | ZNE    | eS                | 08     | 14   |      |         |             |              |                                               |
|       | NE     | eSS               | 09     | (46) |      |         |             |              | In minute time break.                         |
|       | ZNE    | e(LR)             | 12     | -    |      |         |             |              |                                               |
|       | N      | M                 |        | 37   |      | 20      | >+1048      |              |                                               |
|       | Z      | M                 | 15     | 19   |      | 14      | >- 367      |              |                                               |
|       | E      | M                 | 16     | 45   | (15) |         | >(-381)     |              |                                               |
|       |        | (F)               | 16     | 45   | -    |         |             |              | Overlapped by next shock?                     |
| 9     | Z      | 1(P)              | 15     | 12   | 44   |         |             | About 11500? | Weak pulse. Short period vertical instrument. |
|       | ZE     | e(S)              | 23     | (24) |      |         |             |              |                                               |
|       | ZE     | e(SKS)            | 24     | (36) |      |         |             |              |                                               |
|       | ZNE    | e(L)              | 50     | -    |      |         |             |              |                                               |
|       |        | (F)               | 16     | 45   | -    |         |             |              |                                               |

3  
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KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

FEBRUARY 19 48

| DATE. | COMPT.   | PHASE.            | G.M.T. |     |      | PERIOD. | AMPLI-<br>TUDE. | Δ      | REMARKS.                                                                     |
|-------|----------|-------------------|--------|-----|------|---------|-----------------|--------|------------------------------------------------------------------------------|
|       |          |                   | h.     | m.  | s.   |         |                 |        |                                                                              |
| 10    | Z<br>ZNE | e(P)<br>e(S)<br>F | 16     | 03  | 26   |         |                 | (1900) | Non-seismic<br>interference<br>Max. about 16.08½ -.                          |
|       |          |                   |        | 06  | 36   |         |                 |        |                                                                              |
|       |          |                   |        | 25  | -    |         |                 |        |                                                                              |
| 10    | N        | e(L)<br>F         | 16     | 36  | -    |         |                 |        |                                                                              |
|       |          |                   |        | 40  | -    |         |                 |        |                                                                              |
| 10    | N<br>E   | e(L)<br>e(L)<br>F | 19     | 47  | -    |         |                 |        |                                                                              |
|       |          |                   |        | 59  | -    |         |                 |        |                                                                              |
|       |          |                   | 20     | 15  | -    |         |                 |        |                                                                              |
| 11    | Z        | i(P)              | 15     | 52  | 24   |         |                 | (7200) | (Compression). Weak pulse.<br>Short period vertical inst.                    |
|       | E        | e(S)              | 16     | 01  | 02   |         |                 |        |                                                                              |
|       | NE       | e(LQ)             |        | 09  | -    |         |                 |        |                                                                              |
|       | ZNE      | e(LR)             |        | 12  | -    |         |                 |        |                                                                              |
|       |          | F                 | 17     | 45  | -    |         |                 |        |                                                                              |
| 11    | N        | eL<br>F           | 18     | 17  | -    |         |                 |        |                                                                              |
|       |          |                   |        | 25  | -    |         |                 |        |                                                                              |
| 11    | ZNE      | eL<br>F           | 22     | 35  | -    |         |                 |        |                                                                              |
|       |          |                   | 23     | 15  | -    |         |                 |        |                                                                              |
| 12    | Z        | e(P)              | 22     | 32  | 37   |         |                 | (3100) | Weak pulse. Short period<br>vertical instrument.<br>Confused by microseisms. |
|       | NE       | e(S)              |        | 37  | 21   |         |                 |        |                                                                              |
|       | NE       | e(LR)             |        | 40½ | -    |         |                 |        |                                                                              |
|       |          | F                 | 23     | 00  | -    |         |                 |        |                                                                              |
| 13    | Z        | e(P)              | 05     | 07  | (00) |         |                 | (6600) | Short period vertical inst.<br>Confused by microseisms.<br>Weak pulse.       |
|       | E        | e(PP)             |        | 09  | (10) |         |                 |        |                                                                              |
|       | N        | e(S)              |        | 15  | (07) |         |                 |        |                                                                              |
|       | N        | e(ScS)            |        | 16  | (52) |         |                 |        |                                                                              |
|       | NE       | e(SS)             |        | 19  | (21) |         |                 |        |                                                                              |
|       | NE       | e(SSS)            |        | 21  | 00   |         |                 |        |                                                                              |
|       | NE       | e(LQ)             |        | 22  | -    |         |                 |        |                                                                              |
|       | ZNE      | e(LR)             |        | 25  | -    |         |                 |        |                                                                              |
|       | N        | M                 |        | 29  | 39   | 22      | -73             |        |                                                                              |
|       | Z        | M                 |        | 34  | 51   | 17      | -83             |        |                                                                              |
|       | E        | M                 |        |     | 56   | 16      | -44             |        |                                                                              |
|       |          | F                 | 06     | 30  | -    |         |                 |        |                                                                              |
| 13    | N        | e(L)<br>F         | 08     | 30  | -    |         |                 |        |                                                                              |
|       |          |                   |        | 35  | -    |         |                 |        |                                                                              |
| 14    | NE       | e(L)<br>F         | 02     | 10  | -    |         |                 |        |                                                                              |
|       |          |                   |        | 15  | -    |         |                 |        |                                                                              |
| 14    | NE<br>Z  | eL<br>eL<br>F     | 12     | 45  | -    |         |                 |        |                                                                              |
|       |          |                   |        | 54  | -    |         |                 |        |                                                                              |
|       |          |                   | 13     | 10  | -    |         |                 |        |                                                                              |
| 14    | NE       | e(L)<br>F         | 14     | 38  | -    |         |                 |        |                                                                              |
|       |          |                   |        | 50  | -    |         |                 |        |                                                                              |

M.O. 542 502.

**KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.**

**SEISMOLOGICAL BULLETIN.**

**FEBRUARY 19 48**

| DATE. | COMPT. | PHASE.              | G.M.T. |                                |      | PERIOD. | AMPLI-<br>TUDE. | Δ      | REMARKS.                                                     |
|-------|--------|---------------------|--------|--------------------------------|------|---------|-----------------|--------|--------------------------------------------------------------|
|       |        |                     | h.     | m.                             | s.   | sec.    | μ               | km.    |                                                              |
| 14    | Z      | e(P)                | 22     | 13                             | 20   |         |                 | (9700) | Short period vertical inst.<br>Weak pulse.                   |
|       | NE     | e(S)                |        | 24                             | 15   |         |                 |        |                                                              |
|       | N      | e(SS)               |        | 29                             | 58   |         |                 |        |                                                              |
|       | N      | e(SSS)              |        | 34                             | 17   |         |                 |        |                                                              |
|       | NE     | e(LQ)               |        | 37 <sup>1</sup> / <sub>2</sub> | -    |         |                 |        |                                                              |
|       | ZNE    | e(LR)               |        | 40                             | -    |         |                 |        |                                                              |
|       | F      |                     | 23     | 30                             | -    |         |                 |        |                                                              |
| 15    | Z      | e(P)                | 18     | 00                             | 21   |         |                 | (3000) | } Short period vertical inst.<br>Weak pulses.<br>Weak pulse. |
|       | ZE     | e(PP)               |        | 01                             | 05   |         |                 |        |                                                              |
|       | ZE     | e(PPP)              |        |                                | (25) |         |                 |        |                                                              |
|       | ZNE    | e(S)                |        | 05                             | (01) |         |                 |        |                                                              |
|       | E      | e(SS)               |        | 06                             | (33) |         |                 |        |                                                              |
|       | NE     | e(LR)               |        | 08                             | -    |         |                 |        |                                                              |
|       | Z      | e(S <sub>c</sub> S) |        | 10                             | 56   |         |                 |        |                                                              |
|       | F      |                     |        | 30                             | -    |         |                 |        |                                                              |
| 16    | B      | e(L)                | 02     | 07                             | -    |         |                 |        |                                                              |
|       | F      |                     |        | 35                             | -    |         |                 |        |                                                              |
| 17    | ZNE    | e(L)                | 22     | 30                             | -    |         |                 |        |                                                              |
|       | F      |                     | 23     | 15                             | -    |         |                 |        |                                                              |
| 18    | ZNE    | eL                  | 02     | 30                             | -    |         |                 |        |                                                              |
|       | F      |                     | 03     | 25                             | -    |         |                 |        |                                                              |
| 18    | ZN     | 1P                  | 20     | 36                             | 29   |         |                 | 3700   | Compression. Azimuth N'ly?                                   |
|       | Z      | e(PP)               |        | 37                             | (30) |         |                 |        |                                                              |
|       | Z      | e(P <sub>c</sub> P) |        | 39                             | (02) |         |                 |        |                                                              |
|       | E      | e                   |        | 41                             | 23   |         |                 |        |                                                              |
|       | ZNE    | eS                  |        |                                | 49   |         |                 |        |                                                              |
|       | ZNE    | eP <sub>c</sub> S   |        | 42                             | 59   |         |                 |        |                                                              |
|       | ZNE    | eSS                 |        | 43                             | 41   |         |                 |        |                                                              |
|       | E      | eLQ                 |        | 44 <sup>1</sup> / <sub>2</sub> | -    |         |                 |        |                                                              |
|       | ZNE    | eLR                 |        | 45 <sup>1</sup> / <sub>2</sub> | -    |         |                 |        |                                                              |
|       | NE     | eS <sub>c</sub> S   |        | 46                             | 58   |         |                 |        |                                                              |
|       | N      | M                   |        | 48                             | 59   | 20      | +38             |        |                                                              |
|       | E      | M                   |        | 54                             | 00   | 13      | +34             |        |                                                              |
|       | Z      | M                   |        |                                | 04   | 12      | -47             |        |                                                              |
|       | ZNE    | e(PKKP)             | 21     | 14 <sup>1</sup> / <sub>2</sub> | -    |         |                 |        |                                                              |
|       | F      |                     | 22     | 30                             | -    |         |                 |        |                                                              |
| 21    | ZNE    | e(L)                | 13     | 50                             | -    |         |                 |        | Confused by microseisms                                      |
|       | F      |                     | 14     | 10                             | -    |         |                 |        |                                                              |
| 21    | ZNE    | e(L)                | 15     | 17                             | -    |         |                 |        |                                                              |
|       | F      |                     |        | 25                             | -    |         |                 |        |                                                              |
| 26    | ZNE    | e(L)                | 04     | 35                             | -    |         |                 |        | Confused my microseisms                                      |
|       | F      |                     | 05     | 00                             | -    |         |                 |        |                                                              |
| 28    | Z      | 1(P)                | 02     | 09                             | 15   |         |                 | (7600) | Compression. N.,e.                                           |

M.O. 542 502.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

FEBRUARY 19 48

| DATE.         | COMPT. | PHASE. | G.M.T. |    |      | PERIOD. | AMPLI-<br>TUDE. | Δ   | REMARKS.                                   |
|---------------|--------|--------|--------|----|------|---------|-----------------|-----|--------------------------------------------|
|               |        |        | h.     | m. | s.   |         |                 |     |                                            |
| 28<br>(Contd) | E      | e(PP)  | 02     | 11 | (50) |         | μ               | km. | } Weak pulses.<br>Confused by microseisms. |
|               | NE     | e(S)   |        | 18 | (14) |         |                 |     |                                            |
|               | N      | e(PS)  |        |    | (24) |         |                 |     |                                            |
|               | NE     | e(SS)  |        | 22 | (44) |         |                 |     |                                            |
|               | E      | e(SSS) |        | 25 | (50) |         |                 |     |                                            |
|               | NE     | e(LQ)  |        | 27 | -    |         |                 |     |                                            |
|               | NE     | e(LR)  |        | 30 | -    |         |                 |     |                                            |
|               | F      |        | 03     | 30 | -    |         |                 |     |                                            |
| 28            | E      | e(L)   | 22     | 49 | -    |         |                 |     |                                            |
|               |        | F      |        | 55 | -    |         |                 |     |                                            |

M.O.
502

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.
7 APR 1948.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR
MARCH
19
48

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD T <sub>1</sub> . | PENDULUM FREE PERIOD T. | DAMPING CONSTANT $\mu^2$ . | $\frac{Ak}{\pi l}$   |
|------------|----------------------------------|-------------------------------------------|-------------------------|----------------------------|----------------------|
| N.         | 1940. Nov. 29                    | 24.5 <sup>sec.</sup>                      | 8.2 <sup>sec.</sup>     | 0.00                       | 74.3 <sup>sec.</sup> |
| E.         | 1940. Nov. 27                    | 24.0                                      | 8.0                     | 0.00                       | 81.5                 |
| Z.         | 1940. Dec. 14                    | 14.4                                      | 14.2                    | 0.00                       | 75.9                 |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT. | PHASE. | G.M.T. |    |      | PERIOD.        | AMPLI-TUDE.       | $\Delta$<br>km. | REMARKS.                                     |
|-------|--------|--------|--------|----|------|----------------|-------------------|-----------------|----------------------------------------------|
|       |        |        | h.     | m. | s.   |                |                   |                 |                                              |
| ✓ 1   | ZE     | eP     | 01     | 27 | 17   | 20<br>22<br>18 | +48<br>+80<br>-48 | 12 800          | Very small.<br>Marked by microseisms.        |
|       | Z      | ePKP   |        | 31 | 07   |                |                   |                 |                                              |
|       | ZNE    | ePP    |        | 32 | 16   |                |                   |                 |                                              |
|       | Z      | ePPP   |        | 34 | 24   |                |                   |                 |                                              |
|       | Z      | eSKS   |        | 37 | 27   |                |                   |                 |                                              |
|       | E      | eSKKS  |        | 39 | 06   |                |                   |                 |                                              |
|       | E      | e(PS)  |        | 41 | 37   |                |                   |                 |                                              |
|       | Z      | iPS    |        | 41 | 44   |                |                   |                 |                                              |
|       | Z      | i      |        | 42 | 50   |                |                   |                 |                                              |
|       | Z      | iSPP   |        | 43 | 06   |                |                   |                 |                                              |
|       | N      | iSS    |        | 48 | 20   |                |                   |                 |                                              |
|       | E      | i      |        | 52 | 11   |                |                   |                 |                                              |
|       | N      | iSSS   |        | 52 | 24   |                |                   |                 |                                              |
|       | ZNE    | e      |        | 59 | 34   |                |                   |                 |                                              |
|       | ZNE    | eLR    | 2      | 07 | -    |                |                   |                 |                                              |
|       | E      | M      |        | 22 | 23   |                |                   |                 |                                              |
|       | N      | M      |        | 23 | 20   |                |                   |                 |                                              |
|       | Z      | M      |        | 23 | 25   |                |                   |                 |                                              |
|       | ZE     | eL2    | 3      | 26 | -    |                |                   |                 |                                              |
|       |        | F      | 4      | 30 | -    |                |                   |                 |                                              |
| 2     | Z      | iP     | 08     | 54 | 33   | 10,200         |                   |                 | Short period Z instrument only.              |
|       | ZNE    | eLR    | 09     | 01 | -    |                |                   |                 |                                              |
|       |        | F      |        | 10 | -    |                |                   |                 |                                              |
| ✓ 3   | Zv     | eP     | 09     | 23 | 03   |                |                   |                 | No Galitzin Z record till 14h 52m.           |
|       | NE     | eSKS   |        | 33 | (37) |                |                   |                 |                                              |
| 2     | NE     | eS     |        | 34 | 02   |                |                   |                 | Near NW Luzon.<br>180N., 1190E. (U.S.C.G.S.) |
|       | NE     | eSS    |        | 40 | 19   |                |                   |                 |                                              |
| 2     | N      | eSSS   |        | 44 | 34   |                |                   |                 |                                              |
|       | N      | eLQ    |        | 50 | -    |                |                   |                 |                                              |

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

MARCH



International  
Seismological  
Centre

| DATE. | COMPT. | PHASE. | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | Δ    | REMARKS.                                                                                                                |
|-------|--------|--------|--------|----|----|---------|-----------------|------|-------------------------------------------------------------------------------------------------------------------------|
|       |        |        | h.     | m. | s. |         |                 |      |                                                                                                                         |
|       |        |        |        |    |    | sec.    | μ               | km.  |                                                                                                                         |
|       | NE     | eLR    | 09     | 56 | -  | .       |                 |      |                                                                                                                         |
|       | N      | M      |        | 58 | 57 | 29      | +160            |      |                                                                                                                         |
|       | E      | M      | 10     | 01 | 18 | 20      | +87             |      |                                                                                                                         |
|       | N      | M      |        | 08 | 30 | 19      | +120            |      |                                                                                                                         |
|       |        | F      | 12     | 15 | -  |         |                 |      |                                                                                                                         |
| 4     | ZV     | iP     | 02     | 05 | 53 |         |                 |      | Short period Z instrument.<br>Central Peru.<br>10°S., 75°W.<br>(U.S.C.G.S.).                                            |
|       | E      | e      |        | 16 | 27 |         |                 |      |                                                                                                                         |
|       | ZNE    | eL     |        | 30 | -  |         |                 |      |                                                                                                                         |
|       |        | F      | 03     | 20 | -  |         |                 |      |                                                                                                                         |
| 4     | NE     | eL     | 15     | 05 | -  |         |                 |      | Very small.<br>Only trace Visible on Z.                                                                                 |
|       |        | F      |        | 15 | -  |         |                 |      |                                                                                                                         |
| 4     | NE     | eL     | 17     | 53 | -  |         |                 |      | Very small.<br>Only trace visible on Z.                                                                                 |
|       |        | F      | 18     | 05 | -  |         |                 |      |                                                                                                                         |
| 4/5   | NE     | eL     | 23     | 46 | -  |         |                 |      |                                                                                                                         |
|       | Z      | eL     |        | 53 | -  |         |                 |      |                                                                                                                         |
|       |        | F      | 00     | 15 | -  |         |                 |      |                                                                                                                         |
| 6     | ZV     | iP     | 20     | 18 | 16 |         |                 | 2800 | Short period Z inst. only.<br><br>No long waves on Z,<br>probably deeper than normal.                                   |
|       | ZNE    | eS     |        | 22 | 41 |         |                 |      |                                                                                                                         |
|       | LE     | eL     |        | 25 | -  |         |                 |      |                                                                                                                         |
|       |        | F      |        | 45 | -  |         |                 |      |                                                                                                                         |
| 7     | ZV     | eP     | 19     | 01 | 54 |         |                 |      | Short period Z inst. only.<br>Off E Coast of Kamtchatka.<br>54°N., 161°E.(U.S.C.G.S.).                                  |
|       | NE     | eL     |        | 30 |    |         |                 |      |                                                                                                                         |
|       |        | F      | 20     | 20 |    |         |                 |      |                                                                                                                         |
| 8     | ZV     | e(PKP) | 16     | 26 | 48 |         |                 |      | Short period Z instrument.<br>Z later; masked by<br>microseisms.<br>Solomon Islands region<br>6°S., 157°E.(U.S.C.G.S.). |
|       | NE     | eL     | 17     | 07 | -  |         |                 |      |                                                                                                                         |
|       |        | F      | 18     | 20 | -  |         |                 |      |                                                                                                                         |
| 9     | ZV     | e      | 19     | 16 | 15 |         |                 |      | NE of New Guinea.<br>3°S., 147°E.<br>(U.S.C.G.S.).                                                                      |
|       | E      | e      |        | 20 | 16 |         |                 |      |                                                                                                                         |
|       | NE     | e      |        | 24 | 38 |         |                 |      |                                                                                                                         |
|       | NE     | e      |        | 30 | 21 |         |                 |      |                                                                                                                         |
|       | NE     | eL     |        | 43 |    |         |                 |      |                                                                                                                         |
|       | Z      | eL     |        | 50 |    |         |                 |      |                                                                                                                         |
|       | E      | M      | 20     | 00 | 13 | 20      | +20             |      |                                                                                                                         |
|       | N      | M      |        | 01 | 05 | 22      | +48             |      |                                                                                                                         |
|       |        | F      | 21     | 25 | -  |         |                 |      |                                                                                                                         |
| 10    | N      | e      | 12     | 08 | 24 |         |                 |      | Large microseisms on Z<br>components.<br>Kermadec Islands region.<br>29°S., 177°E.(U.S.C.G.S.).                         |
|       | N      | e      |        | 16 | 56 |         |                 |      |                                                                                                                         |
|       | N      | e      |        | 21 | 56 |         |                 |      |                                                                                                                         |
|       | N      | eLQ    |        | 32 | -  |         |                 |      |                                                                                                                         |
|       | NE     | eLR    |        | 39 | -  |         |                 |      |                                                                                                                         |
|       |        | F      | 13     | 50 |    |         |                 |      |                                                                                                                         |
| 10    | N      | e      | 20     | 44 | 18 |         |                 |      | Confused by microseisms.                                                                                                |
|       | N      | e      |        | 47 | 56 |         |                 |      |                                                                                                                         |
|       | NE     | eL     |        | 57 | -  |         |                 |      |                                                                                                                         |
|       |        | F      | 21     | 35 | -  |         |                 |      |                                                                                                                         |

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR MARCH 19 48



Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION : RIVER GRAVEL RESTING ON LONDON CLAY.

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| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD T <sub>1</sub> . | PENDULUM FREE PERIOD T. | DAMPING CONSTANT μ <sup>2</sup> . | $\frac{Ak}{\pi l}$   |
|------------|----------------------------------|-------------------------------------------|-------------------------|-----------------------------------|----------------------|
| N.         | 1940. Nov. 29                    | 24 <sup>sec</sup> .5                      | 8.2 <sup>sec</sup> .    | 0.00                              | 74 <sup>sec</sup> .3 |
| E.         | 1940. Nov. 27                    | 24.0                                      | 8.0                     | 0.00                              | 81.5                 |
| Z.         | 1940. Dec. 14                    | 14.4                                      | 14.2                    | 0.00                              | 75.9                 |

TIME SERVICE : MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

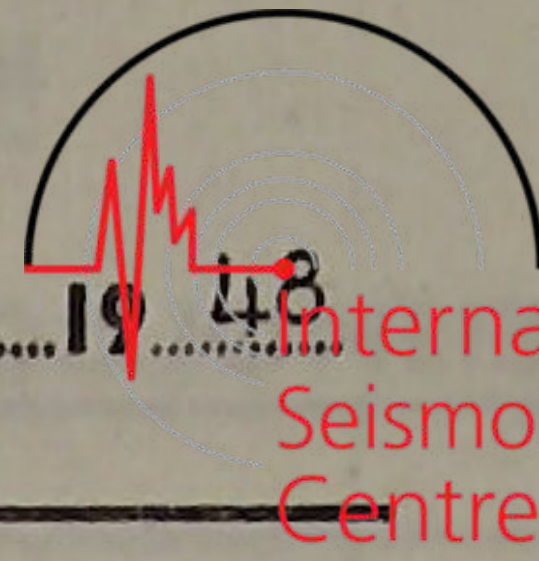
SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT. | PHASE. | G.M.T.   | PERIOD. | AMPLI-TUDE. | Δ      | REMARKS.                           |
|-------|--------|--------|----------|---------|-------------|--------|------------------------------------|
|       |        |        | h. m. s. | sec.    |             | km.    |                                    |
| 1     | ZE     | eP     | 01 27 17 |         |             | 12 800 |                                    |
|       | Z      | ePKP   | 31 07    |         |             |        |                                    |
|       | ZNE    | ePP    | 32 16    |         |             |        |                                    |
|       | Z      | ePPP   | 34 24    |         |             |        |                                    |
|       | Z      | eSKS   | 37 27    |         |             |        |                                    |
|       | E      | eSKKS  | 39 06    |         |             |        |                                    |
|       | E      | e(PS)  | 41 37    |         |             |        |                                    |
|       | Z      | iPS    | 41 44    |         |             |        |                                    |
|       | Z      | i      | 42 50    |         |             |        |                                    |
|       | Z      | iSPP   | 43 06    |         |             |        |                                    |
|       | N      | iSS    | 48 20    |         |             |        |                                    |
|       | E      | i      | 52 11    |         |             |        |                                    |
|       | N      | iSSS   | 52 24    |         |             |        |                                    |
|       | ZNE    | e      | 59 34    |         |             |        |                                    |
|       | ZNE    | eLR    | 2 07 -   |         |             |        |                                    |
|       | E      | M      | 22 23    | 20      | +48         |        |                                    |
|       | N      | M      | 23 20    | 22      | +80         |        |                                    |
|       | Z      | M      | 23 25    | 18      | -48         |        |                                    |
|       | ZE     | eLz    | 3 26 -   |         |             |        |                                    |
|       |        | F      | 4 30 -   |         |             |        |                                    |
| 2     | Z      | iP     | 08 54 33 |         |             |        | Very small.                        |
|       | ZNE    | eLR    | 09 01 -  |         |             |        | Marked by microseisms.             |
|       |        | F      | 10 -     |         |             |        |                                    |
| 3     | Zv     | eP     | 09 23 03 |         |             | 10,200 | Short period Z instrument only.    |
|       | NE     | eSKS   | 33 (37)  |         |             |        |                                    |
|       | NE     | eS     | 34 02    |         |             |        | No Galitzin Z record till 14h 52m. |
|       | NE     | eSS    | 40 19    |         |             |        |                                    |
|       | N      | eSSS   | 44 34    |         |             |        | Near NW Luzon.                     |
|       | N      | eLQ    | 50 -     |         |             |        | 180N., 1190E. (U.S.C.G.S.)         |

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

MARCH



| DATE. | COMPT.                                       | PHASE.                              | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | $\Delta$ | REMARKS.                                                                                                                                                          |
|-------|----------------------------------------------|-------------------------------------|--------|----|----|---------|-----------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                                              |                                     | h.     | m. | s. |         |                 |          |                                                                                                                                                                   |
| 13    | Z <sub>V</sub>                               | e<br>F                              | 08     | 10 | 10 |         |                 |          | Short period Z inst. only.<br>Very small.                                                                                                                         |
|       |                                              |                                     |        | 25 | -  |         |                 |          |                                                                                                                                                                   |
| 13    | Z <sub>V</sub><br>ZNE<br>ZN<br>Z<br>ZNE<br>E | e(P)<br>e<br>e<br>e<br>eL<br>M<br>F | 20     | 20 | 26 | 24      | +18             |          | Short period Z instrument.<br>Probably deeper than normal.<br>E unreadable.<br>Also shown on short period V.<br><br>Molacca Passage.<br>1°N., 126°E. (U.S.C.G.S.) |
|       |                                              |                                     |        | 30 | 52 |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 31 | 31 |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 31 | 54 |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 47 |    |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     | 21     | 02 | 43 |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     | 22     | 50 | -  |         |                 |          |                                                                                                                                                                   |
| 14    | E                                            | eL<br>F                             | 21     | 47 | -  |         |                 |          | No N-S record 14th<br>09.40 to 15th 16.33.                                                                                                                        |
|       |                                              |                                     | 22     | 05 | -  |         |                 |          |                                                                                                                                                                   |
| 14    | E                                            | eL<br>F                             | 22     | 20 | -  |         |                 |          | No N-S record.<br>Off SW Coast of Peru.<br>17°S., 75°W. (U.S.C.G.S.)                                                                                              |
|       |                                              |                                     | 23     | 15 | -  |         |                 |          |                                                                                                                                                                   |
| 15    | E                                            | eL<br>F                             | 02     | 23 | -  |         |                 |          | No N-S records.                                                                                                                                                   |
|       |                                              |                                     |        | 55 | -  |         |                 |          |                                                                                                                                                                   |
| 15    | E                                            | e<br>eL<br>F                        | 11     | 47 | -  |         |                 |          | No N-S record.<br>Z confused by microseisms.                                                                                                                      |
|       |                                              |                                     | 12     | 11 | -  |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 55 | -  |         |                 |          |                                                                                                                                                                   |
| 16    | NE                                           | eL<br>F                             | 03     | 31 | -  |         |                 |          | Z confused by microseisms.                                                                                                                                        |
|       |                                              |                                     | 04     | 15 | -  |         |                 |          |                                                                                                                                                                   |
| 16    | NE                                           | eL<br>F                             | 18     | 9  | -  |         |                 |          | Z confused by microseisms.                                                                                                                                        |
|       |                                              |                                     | 19     | 20 | -  |         |                 |          |                                                                                                                                                                   |
| 17    | N                                            | e<br>F                              | 1      | 45 | -  |         |                 |          | Possibly not seismic.                                                                                                                                             |
|       |                                              |                                     | 2      | 10 | -  |         |                 |          |                                                                                                                                                                   |
| 17    | NE                                           | eL<br>F                             | 20     | 39 | -  |         |                 |          | Z confused by microseisms.                                                                                                                                        |
|       |                                              |                                     | 21     | 20 | -  |         |                 |          |                                                                                                                                                                   |
| 21    | NE<br>N<br>N<br>NE<br>N                      | e<br>e<br>e<br>eL<br>M<br>F         | 22     | 04 | 14 | 16      | +10             |          | Heavy microseisms.                                                                                                                                                |
|       |                                              |                                     |        | 09 | 30 |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 13 | 02 |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 25 | -  |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 37 | 01 |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     | 23     | 25 | -  |         |                 |          |                                                                                                                                                                   |
| 22    | N                                            | eL<br>F                             | 00     | 45 | -  |         |                 |          | Heavy microseisms.<br>SW Coast of Peru.<br>14°S., 75°W. (U.S.C.G.S.)                                                                                              |
|       |                                              |                                     | 01     | 00 | -  |         |                 |          |                                                                                                                                                                   |
| 22    | E<br>N<br>ZE                                 | e<br>eLQ<br>eLR<br>F                | 22     | 02 | 14 |         |                 |          | Weak pulse.                                                                                                                                                       |
|       |                                              |                                     |        | 09 | -  |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 14 | -  |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     |        | 45 | -  |         |                 |          |                                                                                                                                                                   |
| 23    | NE                                           | eL<br>F                             | 00     | 17 |    |         |                 |          | No Z record<br>23d. 15h 1m to<br>24d. 9h 20m.                                                                                                                     |
|       |                                              |                                     |        | 40 |    |         |                 |          |                                                                                                                                                                   |
| 23    | NE                                           | e<br>F                              | 18     | 34 | -  |         |                 |          |                                                                                                                                                                   |
|       |                                              |                                     | 19     | 20 | -  |         |                 |          |                                                                                                                                                                   |

M.O.....502.....

**KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.**

**SEISMOLOGICAL BULLETIN.**

**MARCH.....19...48**

| DATE. | COMPT.                                     | PHASE.                                               | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | Δ        | REMARKS.                                      |
|-------|--------------------------------------------|------------------------------------------------------|--------|----|----|---------|-----------------|----------|-----------------------------------------------|
|       |                                            |                                                      | h.     | m. | s. | sec.    | μ               | km.      |                                               |
| 24    | NE                                         | e<br>F                                               | 00     | 16 | -  |         |                 |          | Very small; possibly not seismic.             |
|       |                                            |                                                      |        | 20 | -  |         |                 |          |                                               |
| 24    | ZV<br>E<br>E<br>NE<br>NE<br>NE<br>N        | ePP<br>eSKS<br>e(PPS)<br>eSS<br>eSSS<br>eL<br>M<br>F | 05     | 37 | 50 |         |                 | (11,200) | Short period Z inst. only.                    |
|       |                                            |                                                      |        | 44 | 18 |         |                 |          |                                               |
|       |                                            |                                                      |        | 47 | 20 |         |                 |          | Off Southern Sumatra                          |
|       |                                            |                                                      |        | 52 | 54 |         |                 |          | 60S., 104°E. (U.S.C.G.S.)                     |
|       |                                            |                                                      |        | 56 | 30 |         |                 |          |                                               |
|       |                                            |                                                      | 06     | 04 |    | 23      | -24             |          |                                               |
|       |                                            |                                                      |        | 21 | 11 |         |                 |          |                                               |
|       |                                            |                                                      | 07     | 55 |    |         |                 |          |                                               |
| 24    | NE                                         | eL<br>F                                              | 08     | 05 | -  |         |                 |          | No Z record.                                  |
|       |                                            |                                                      |        | 15 | -  |         |                 |          |                                               |
| 24    | NE                                         | eL<br>F                                              | 22     | 41 | -  |         |                 |          |                                               |
|       |                                            |                                                      |        | 50 | -  |         |                 |          |                                               |
| 25    | NE                                         | eL<br>F                                              | 07     | 04 | -  |         |                 |          | Very small.                                   |
|       |                                            |                                                      |        | 10 | -  |         |                 |          |                                               |
| 26    | ZV<br>ZV<br>E<br>ZNE<br>ZE                 | eP<br>ePP<br>eS<br>eL<br>1P <sub>c</sub> S<br>F      | 03     | 06 | 21 |         |                 | 2260     | Short period Z instrument<br>Also shown on Z. |
|       |                                            |                                                      |        | 07 | 00 |         |                 |          |                                               |
|       |                                            |                                                      |        | 10 | 01 |         |                 |          |                                               |
|       |                                            |                                                      |        | 11 | -  |         |                 |          | Well marked phase.                            |
|       |                                            |                                                      |        | 14 | 21 |         |                 |          |                                               |
|       |                                            |                                                      |        | 25 |    |         |                 |          |                                               |
| 26    | NE                                         | e<br>F                                               | 13     | 42 | -  |         |                 |          |                                               |
|       |                                            |                                                      |        | 15 | -  |         |                 |          |                                               |
| 27    | NE                                         | e<br>F                                               | 09     | 32 | -  |         |                 |          |                                               |
|       |                                            |                                                      |        | 55 | -  |         |                 |          |                                               |
| 29    | ZV<br>E<br>E<br>E<br>ZE                    | eP<br>eS<br>eSS<br>e<br>eL<br>F                      | 02     | 38 | 20 |         |                 | 3000     | Short period Z inst. only.<br>No N record.    |
|       |                                            |                                                      |        | 42 | 57 |         |                 |          |                                               |
|       |                                            |                                                      |        | 44 | 08 |         |                 |          |                                               |
|       |                                            |                                                      |        | 45 | 08 |         |                 |          |                                               |
|       |                                            |                                                      |        | 50 |    |         |                 |          |                                               |
|       |                                            |                                                      | 03     | 10 | -  |         |                 |          |                                               |
| 29    | ZV<br>ZNE<br>NE<br>Z<br>Z<br>ZNE<br>N<br>E | eP<br>ePP<br>eS<br>eS<br>i<br>eL<br>M<br>M<br>F      | 10     | 27 | 52 |         |                 | 2600     | Short period Z instrument.                    |
|       |                                            |                                                      |        | 28 | 36 |         |                 |          |                                               |
|       |                                            |                                                      |        | 32 | 00 |         |                 |          |                                               |
|       |                                            |                                                      |        | 32 | 05 |         |                 |          |                                               |
|       |                                            |                                                      |        | 33 | 19 |         |                 |          |                                               |
|       |                                            |                                                      |        | 34 | -  |         |                 |          |                                               |
|       |                                            |                                                      |        | 37 | 22 | 16      | +22             |          |                                               |
|       |                                            |                                                      |        | 38 | 56 | 14      | -18             |          |                                               |
|       |                                            |                                                      | 11     | 15 | -  |         |                 |          |                                               |
| 29    | ZV<br>ZV<br>ZV<br>ZV<br>ZNE<br>N<br>E      | e(P)<br>i<br>i<br>i<br>i<br>i<br>e<br>eL<br>F        | 12     | 10 | 28 |         |                 |          | Short period Z inst. only.                    |
|       |                                            |                                                      |        | 10 | 32 |         |                 |          |                                               |
|       |                                            |                                                      |        | 10 | 57 |         |                 |          | Confused by microseisms.                      |
|       |                                            |                                                      |        | 11 | 13 |         |                 |          |                                               |
|       |                                            |                                                      |        | 13 | 56 |         |                 |          | Possibly more than one shock                  |
|       |                                            |                                                      |        | 24 | 53 |         |                 |          |                                               |
|       |                                            |                                                      | 12     | 50 | -  |         |                 |          |                                               |
|       |                                            |                                                      | 14     | 10 | -  |         |                 |          |                                               |

M.O.

502

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

OFFICE

EDINBURGH

2 JUN 1948

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR APRIL 19 48

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD T <sub>1</sub> . | PENDULUM FREE PERIOD T. | DAMPING CONSTANT μ <sup>2</sup> . | $\frac{Ak}{\pi l}$ |
|------------|----------------------------------|-------------------------------------------|-------------------------|-----------------------------------|--------------------|
| N.         |                                  | sec.                                      | sec.                    |                                   | sec <sup>-1</sup>  |
| E.         |                                  |                                           |                         |                                   |                    |
| Z.         |                                  |                                           |                         |                                   |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.  
TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.  
SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT.                    | PHASE.                      | G.M.T.                                                    | PERIOD. | AMPLITUDE. | Δ   | REMARKS.                                       |
|-------|---------------------------|-----------------------------|-----------------------------------------------------------|---------|------------|-----|------------------------------------------------|
|       |                           |                             | h. m. s.                                                  | sec.    | μ          | km. |                                                |
| 3     | NE                        | e<br>F                      | 08 40 -<br>55 -                                           |         |            |     | Confused by microseisms; possibly not seismic. |
| 4     | NE                        | e<br>F                      | 11 50 -<br>12 50 -                                        |         |            |     | Doubtful if seismic.                           |
| 4     | NE                        | e<br>F                      | 13 45 -<br>14 05 -                                        |         |            |     | Doubtful if seismic.                           |
| 4     | NE                        | e<br>F                      | 15 45 -<br>16 15 -                                        |         |            |     | Doubtful if seismic.                           |
| 8     | ZN<br>N<br>N<br>NE<br>ZNE | e<br>e<br>e<br>e<br>eL<br>F | 00 48 35<br>59 16<br>01 10 23<br>45 09<br>51 -<br>02 15 - |         |            |     | Doubtful if seismic.                           |
| 8     | ZV<br>ZV<br>NE            | e<br>e<br>e<br>F            | 14 06 25<br>07 10<br>14 48<br>25 -                        |         |            |     | Short period Z instrument.                     |
| 9     | NE                        | eL<br>F                     | 15 31 -<br>50 -                                           |         |            |     |                                                |
| 13    | NE                        | eL<br>F                     | 09 55 -<br>10 25 -                                        |         |            |     |                                                |
| 14    | NE                        | e<br>F                      | 10 46 -<br>11 10 -                                        |         |            |     | Possibly not seismic.                          |

**KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.****SEISMOLOGICAL BULLETIN.**

APRIL

19 48

| DATE. | COMPT.                                                                                                       | PHASE.                                                                                                   | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | $\Delta$ | REMARKS.                                                                                                         |
|-------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------|----|----|---------|-----------------|----------|------------------------------------------------------------------------------------------------------------------|
|       |                                                                                                              |                                                                                                          | h.     | m. | s. |         |                 |          |                                                                                                                  |
| 15    | NE                                                                                                           | e<br>F                                                                                                   | 20     | 40 | -  |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          | 21     | 20 | -  |         |                 |          |                                                                                                                  |
| 16    | -                                                                                                            | -                                                                                                        | -      | -  | -  |         |                 |          |                                                                                                                  |
| 17    | ZV,ZNE<br>ZV<br>ZV,ZNE<br>ZNE<br>ZE<br>ZNE<br>ZE<br>Z<br>NE<br>ZNE<br>ZNE<br>ZNE<br>Z<br>NE<br>ZNE<br>N<br>Z | iP<br>i<br>iPP<br>iSKS<br>iS<br>iPS<br>iPPS<br>i<br>i<br>e<br>eSS<br>i<br>i<br>eLQ<br>eLR<br>M<br>M<br>F | 16     | 24 | 18 |         |                 | 9700     | Adjusting: 14h14m to 15h53m, and 16h48m to 17h00m.<br>Compression.<br>Short period Z instrument<br>Large motion. |
|       |                                                                                                              |                                                                                                          |        | 24 | 57 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 27 | 42 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 34 | 44 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 35 | 04 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 35 | 55 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 36 | 35 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 38 | 28 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 38 | 36 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 39 | 26 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 40 | 34 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 47 | 07 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 53 | 31 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 57 | -  |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          | 17     | 00 | -  |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 09 | 19 | 14      | -225            |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 11 | 11 | 12      | +430            |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          | 20     | 40 | -  |         |                 |          |                                                                                                                  |
| 18    | ZV,ZNE<br>ZV,ZNE<br>ZV,ZE<br>ZNE<br>ZNE<br>ZNE<br>ZE<br>E<br>Z<br>Z<br>Z<br>NE<br>Z<br>Z<br>Z<br>N<br>Z      | i<br>e<br>e<br>e<br>e<br>e<br>e<br>e<br>e<br>e<br>eLQ<br>e<br>e<br>eLQ<br>e<br>e<br>eLR<br>M<br>M<br>F   | 12     | 40 | 18 |         |                 |          | Short and long period Z instruments.                                                                             |
|       |                                                                                                              |                                                                                                          |        | 41 | 05 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 42 | 48 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 47 | 09 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 50 | 02 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 51 | 06 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 57 | 04 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 57 | 56 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          | 13     | 00 | 24 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 06 | 11 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 07 | 00 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 16 | -  |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 17 | 50 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 18 | 50 |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 21 | -  |         |                 |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 34 | 24 | 21      | +49             |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          |        | 34 | 24 | 20      | +77             |          |                                                                                                                  |
|       |                                                                                                              |                                                                                                          | 15     | 40 | -  |         |                 |          |                                                                                                                  |
| 20    | ZE                                                                                                           | eL<br>F                                                                                                  | 02     | 50 | -  |         |                 |          | Very small on N-S component.                                                                                     |
|       |                                                                                                              |                                                                                                          | 03     | 05 | -  |         |                 |          |                                                                                                                  |
| 20    | E                                                                                                            | e<br>F                                                                                                   | 20     | 01 | -  |         |                 |          | No records on N-S and Z components.<br>Possibly not seismic.                                                     |
|       |                                                                                                              |                                                                                                          |        | 20 | -  |         |                 |          |                                                                                                                  |
| 21    | E                                                                                                            | e<br>F                                                                                                   | 01     | 50 | -  |         |                 |          | No records on N-S and Z components.<br>Possibly not seismic.                                                     |
|       |                                                                                                              |                                                                                                          | 02     | 05 | -  |         |                 |          |                                                                                                                  |

M.O.....502.....

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

APRIL

19 48

| DATE. | COMPT. | PHASE.            | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | Δ    | REMARKS.                                                                                                                                                                                                    |
|-------|--------|-------------------|--------|----|----|---------|-----------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |        |                   | h.     | m. | s. | sec.    | μ               | km.  |                                                                                                                                                                                                             |
| -     | -      | -                 | -      | -  | -  |         |                 |      | N-S unserviceable:<br>20d.11h.05m. to 23d.16h.52m.<br>E-W unserviceable:<br>21d.09h.16m. to 23d.16h.52m.<br>Z unserviceable:<br>20d.11h.05m. to 24d.10h.58m.<br>Strips on pendulums corroded<br>and broken. |
| 21    | ZV     | iP                | 20     | 32 | 26 |         |                 | 6700 | Short period Z instrument only.                                                                                                                                                                             |
|       | ZV     | iPP               |        | 32 | 31 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | iP <sub>c</sub> P |        | 32 | 55 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | iPP               |        | 35 | 01 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | i (PPP)           |        | 37 | 05 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | iP <sub>c</sub> S |        | 37 | 23 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | eS                |        | 40 | 50 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | eSS               |        | 41 | 09 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | eSS               |        | 45 | 09 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | eL                |        | 51 | -  |         |                 |      |                                                                                                                                                                                                             |
|       |        | F                 | 22     | 35 | -  |         |                 |      |                                                                                                                                                                                                             |
| 22    | ZV     | eP                | 00     | 38 | 45 |         |                 | 6860 | Short period Z instrument only.                                                                                                                                                                             |
|       | ZV     | iPP               |        | 38 | 48 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | i                 |        | 39 | 01 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | eP <sub>c</sub> P |        | 39 | 22 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | eS                |        | 47 | 07 |         |                 |      |                                                                                                                                                                                                             |
|       | ZV     | eL                |        | 57 | -  |         |                 |      |                                                                                                                                                                                                             |
|       |        | F                 | 01     | 50 | -  |         |                 |      |                                                                                                                                                                                                             |
| 23    | E      | e                 | 20     | 30 | -  |         |                 |      | Very small.<br>Z not recording.                                                                                                                                                                             |
|       |        | F                 |        | 55 | -  |         |                 |      |                                                                                                                                                                                                             |
| 26    | ZE     | e                 | 09     | 36 | 57 |         |                 |      |                                                                                                                                                                                                             |
|       | Z      | i                 |        | 37 | 48 |         |                 |      |                                                                                                                                                                                                             |
|       | ZNE    | eL                |        | 43 | -  |         |                 |      |                                                                                                                                                                                                             |
|       | N      | M                 |        | 44 | 34 | 18      | +16             |      |                                                                                                                                                                                                             |
|       | Z      | M                 |        | 44 | 38 | 14      | +24             |      |                                                                                                                                                                                                             |
|       |        | F                 | 10     | 30 | -  |         |                 |      |                                                                                                                                                                                                             |
| 26    | ZE     | eL                | 10     | 52 | -  |         |                 |      |                                                                                                                                                                                                             |
|       |        | F                 | 11     | 10 | -  |         |                 |      |                                                                                                                                                                                                             |
| 27    | Z      | e                 | 02     | 40 | -  |         |                 |      |                                                                                                                                                                                                             |
|       |        | F                 | 03     | 05 | -  |         |                 |      |                                                                                                                                                                                                             |



AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

JUN 10 1948

Hall

**KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.****SEISMOLOGICAL BULLETIN FOR MAY 19 48**

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD $T_1$ | PENDULUM FREE PERIOD $T$ | DAMPING CONSTANT $\mu^2$ | $\frac{Ak}{\pi l}$ |
|------------|----------------------------------|--------------------------------|--------------------------|--------------------------|--------------------|
| N.         |                                  | sec.                           | sec.                     |                          | sec-1              |
| E.         |                                  |                                |                          |                          |                    |
| Z.         |                                  |                                |                          |                          |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT. | PHASE.  | G.M.T. |    |    | PERIOD. | AMPLITUDE. | $\Delta$ | REMARKS.                                              |
|-------|--------|---------|--------|----|----|---------|------------|----------|-------------------------------------------------------|
|       |        |         | h.     | m. | s. | sec.    | $\mu$      | km.      |                                                       |
| 1     |        | e<br>F  | 02     | 11 | -  |         |            |          |                                                       |
|       |        |         |        | 50 | -  |         |            |          |                                                       |
| 4     | ZNE    | eL<br>F | 14     | 33 | -  |         |            |          |                                                       |
|       |        |         | 15     | 05 | -  |         |            |          |                                                       |
| 7     | -      | -       | 09     | 50 | to |         |            |          | No records; adjusting Z pendulum.                     |
|       |        |         | 15     | 56 | -  |         |            |          |                                                       |
| 8     | ZV,Z   | iP      | 02     | 58 | 39 |         |            |          | Small but clear on short and long period instruments. |
|       | E      | i       |        | 58 | 48 |         |            |          | Kurile Islands.                                       |
|       | EZ     | i       |        | 59 | 06 |         |            |          | 46½°N., 151°E. (U.S.C.G.S.)                           |
|       | E      | i       |        | 59 | 11 |         |            |          |                                                       |
|       | 2F     | F       | 03     | 12 | -  |         |            |          |                                                       |
| ✓ 9   | ZVZE   | iP      | 02     | 21 | 49 |         |            | (9670)   | Compression.                                          |
|       | ZV     | iPcP    |        | 22 | 01 |         |            |          | Off Southern Japan.                                   |
|       | ZE     | ePP     |        | 25 | 13 |         |            |          | 30°N, 129°E (U.S.C.G.S.)                              |
|       | E      | e(SKS)  |        | 32 | 11 |         |            |          |                                                       |
|       | E      | e(S)    |        | 32 | 33 |         |            |          |                                                       |
|       | ZE     | iPS     |        | 32 | 46 |         |            |          |                                                       |
|       | NE     | e       |        | 44 | 53 |         |            |          |                                                       |
|       | Z      | e       |        | 45 | 41 |         |            |          |                                                       |
|       | NE     | e       |        | 46 | 49 |         |            |          |                                                       |
|       | Z      | e       |        | 47 | 41 |         |            |          | Possibly SKKS.                                        |
|       | ZNE    | eLQ     |        | 53 | -  |         |            |          | Possibly P2 <sup>1</sup> P2 <sup>1</sup> .            |
|       | ZNE    | eLR     | 03     | 05 | -  |         |            |          |                                                       |
|       | E      | M       |        | 08 | 30 | 15      | +40        |          |                                                       |
|       | Z      | M       |        | 08 | 35 | 15      | -37        |          |                                                       |
|       |        | F       | 05     | 25 | -  |         |            |          |                                                       |
| 9     | ZE     | e       | 08     | 35 | 53 |         |            |          | Very small.                                           |
|       |        | F       | 10     | 30 | -  |         |            |          |                                                       |

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

MAY 19 48

SEISMOLOGICAL BULLETIN.

| DATE.   | COMPT. | PHASE. | G.M.T. |    |    | PERIOD. | AMPLI-TUDE. | Δ    | REMARKS.                                                                                             |
|---------|--------|--------|--------|----|----|---------|-------------|------|------------------------------------------------------------------------------------------------------|
|         |        |        | h.     | m. | s. |         |             |      |                                                                                                      |
| ✓ 11    | ZV,E   | i      | 09     | 08 | 47 | 18      | +4          | 9670 | Probably deeper focus than normal.<br>09.h14 <sup>m</sup> to 09.h26 <sup>m</sup><br>changing records |
|         | ZV,E   | i      |        | 09 | 05 |         |             |      |                                                                                                      |
|         | ZE     | e      |        | 27 | 33 |         |             |      |                                                                                                      |
|         | ZE     | e      |        | 28 | 24 |         |             |      |                                                                                                      |
|         | ZNE    | eL     |        | 42 | -  |         |             |      |                                                                                                      |
|         | ZE     | e      |        | 46 | 23 |         |             |      |                                                                                                      |
|         | E      | e      |        | 53 | 58 |         |             |      |                                                                                                      |
|         | Z      | M      |        | 58 | 02 |         |             |      |                                                                                                      |
| ✓ 12    |        | F      | 11     | 25 | -  | 19      | -50<br>+41  | 9220 | Compression.<br>Off north-east coast of Honshu, Japan.<br>38°N, 142½°E. (U.S.C.G.S.)                 |
|         | ZV,ZE  | iP     | 01     | 09 | 34 |         |             |      |                                                                                                      |
|         | ZV,Z   | e      |        | 09 | 51 |         |             |      |                                                                                                      |
|         | ZV     | e      |        | 10 | 09 |         |             |      |                                                                                                      |
|         | E      | ePP    |        | 12 | 41 |         |             |      |                                                                                                      |
|         | ZE     | e      |        | 12 | 53 |         |             |      |                                                                                                      |
|         | ZE     | ePPP   |        | 14 | 59 |         |             |      |                                                                                                      |
|         | ZE     | eSKS   |        | 19 | 49 |         |             |      |                                                                                                      |
|         | ZE     | eS     |        | 20 | 17 |         |             |      |                                                                                                      |
|         | ZE     | ePS    |        | 21 | 01 |         |             |      |                                                                                                      |
|         | ZE     | ePPS   |        | 21 | 29 |         |             |      |                                                                                                      |
|         | ZE     | eSS    |        | 25 | 47 |         |             |      |                                                                                                      |
|         | NE     | eLQ    |        | 38 | -  |         |             |      |                                                                                                      |
|         | ZNE    | eLR    |        | 48 | -  |         |             |      |                                                                                                      |
|         | E      | M      |        | 48 | 15 |         |             |      |                                                                                                      |
| ✓ 14    | Z      | M      |        | 51 | 12 | 13      | +4          | 9220 |                                                                                                      |
|         |        | F      | 04     | 55 | -  |         |             |      |                                                                                                      |
|         | ZV     | e      | 13     | 37 | 03 |         |             |      |                                                                                                      |
|         | ZNE    | eL     | 14     | 01 | -  |         |             |      |                                                                                                      |
| 14      | Z      | M      |        | 17 | 20 | 16      | +3          | 8090 | Emergent on ZE.<br>South of Alaska Peninsula<br>54½°N, 161°W. (U.S.C.G.S.)                           |
|         |        | F      | 15     | 25 | -  |         |             |      |                                                                                                      |
|         | ZV     | iP     | 18     | 51 | 59 |         |             |      |                                                                                                      |
|         | ZV     | eS     | 19     | 02 | 23 |         |             |      |                                                                                                      |
| ✓ 14/15 | ZNE    | eL     |        | 22 | -  | 19      | +110<br>+80 |      |                                                                                                      |
|         | Z      | M      |        | 34 | 03 |         |             |      |                                                                                                      |
|         |        | F      | 20     | 22 | -  |         |             |      |                                                                                                      |
|         | ZV,ZE  | iP     | 22     | 43 | 16 |         |             |      |                                                                                                      |
|         | ZV,ZE  | iPcP   |        | 43 | 22 |         |             |      |                                                                                                      |
|         | ZV,ZE  | ePP    |        | 46 | 06 |         |             |      |                                                                                                      |
|         | Z      | e      |        | 47 | 08 |         |             |      |                                                                                                      |
|         | ZE     | e(PPP) |        | 47 | 38 |         |             |      |                                                                                                      |
|         | ZV,ZE  | iS     |        | 52 | 43 |         |             |      |                                                                                                      |
|         | ZV     | ePS    |        | 53 | 32 |         |             |      |                                                                                                      |
|         | ZV     | eSS    |        | 58 | 12 |         |             |      |                                                                                                      |
|         | ZNE    | eLQ    |        | 59 | -  |         |             |      |                                                                                                      |
|         | E      | e      | 23     | 01 | 20 |         |             |      |                                                                                                      |
|         | ZE     | eLR    |        | 13 | -  |         |             |      |                                                                                                      |
|         | E      | M      |        | 17 | 32 |         |             |      |                                                                                                      |
| 15      | Z      | M      |        | 20 | 27 | 19      | +80         |      |                                                                                                      |
|         |        | F      | 03     | 40 | -  |         |             |      |                                                                                                      |
|         | ZE     | e      | 18     | 51 | -  |         |             |      |                                                                                                      |
|         | ZE     | eL     |        | 54 | -  |         |             |      |                                                                                                      |
|         |        | F      | 19     | 25 | -  |         |             |      |                                                                                                      |

M.O. 502

# KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

## SEISMOLOGICAL BULLETIN.

MAY

1948

| DATE. | COMPT. | PHASE. | G.M.T. |     |      | PERIOD. | AMPLI-<br>TUDE. | Δ      | REMARKS.                    |
|-------|--------|--------|--------|-----|------|---------|-----------------|--------|-----------------------------|
|       |        |        | h.     | m.  | s.   | sec.    | μ               | km.    |                             |
| 16    | ZE     | e<br>F | 22     | 06  | -    |         |                 |        |                             |
|       |        |        |        | 26  | -    |         |                 |        |                             |
| 17    | ZV     | eP     | 18     | 00  | 04   |         |                 | 8220   | Small.                      |
|       | ZV     | i      |        | 00  | 14   |         |                 |        | South of Alaska.            |
|       | E      | e      |        | 02  | 03   |         |                 |        | 55°N, 161°W. (U.S.C.G.S.)   |
|       | E      | eS     |        | 09  | 34   |         |                 |        |                             |
|       | E      | e      |        | 20  | 02   |         |                 |        |                             |
|       | ZE     | eL     |        | 25° | -    |         |                 |        |                             |
|       |        | F      | 19     | 25  | -    |         |                 |        |                             |
| 20    |        | e      | 07     | 01  | -    |         |                 |        | Possibly not seismic        |
|       |        | F      | 08     | 10  | -    |         |                 |        |                             |
| ✓ 22  | E      | e      | 19     | 58  | (01) |         |                 |        | Very doubtful.              |
|       | ZE     | eL     | 20     | 45  | -    |         |                 |        |                             |
|       | E      | M      | 21     | 09  | 19   | 20      | +5              |        |                             |
|       |        | F      | 22     | 00± | -    |         |                 |        |                             |
| 23    | ZE     | e      | 04     | 47  | -    |         |                 |        | Very small.                 |
|       |        | F      | 05     | 10  | -    |         |                 |        |                             |
| ✓ 25  | ZV     | eP     | 07     | 22  | 54   |         |                 | 8020   | N-S pendulum removed for    |
|       | ZV, ZE | ePcP   |        | 23  | 16   |         |                 |        | overhaul 24d. 09h. 28m.     |
|       | ZE     | e      |        | 23  | 24   |         |                 |        |                             |
|       | ZE     | eS     |        | 32  | 27   |         |                 |        |                             |
|       | E      | ePS    |        | 32  | 45   |         |                 |        | Sikang Province, China.     |
|       | E      | eSS    |        | 36  | 11   |         |                 |        | 30°N, 99½°E. (U.S.C.G.S.)   |
|       | E      | e      |        | 37  | 39   |         |                 |        |                             |
|       | E      | e      |        | 44  | 25   |         |                 |        |                             |
|       | ZE     | eL     |        | 57  | -    |         |                 |        |                             |
|       | E      | M      |        | 58  | 03   | 12      | +65             |        |                             |
|       | Z      | M      | 8      | 02  | 41   | 13      | -25             |        |                             |
|       |        | F      | 10     | 35  | -    |         |                 |        |                             |
| 25    | Z      | e      | 19     | 20  | -    |         |                 |        |                             |
|       |        | F      |        | 40  | -    |         |                 |        |                             |
| 28    | ZV, E  | 1Pg    | 17     | 02  | 53   |         |                 | 120    | Clearly shown on short      |
|       | ZV, E  | iSg    |        | 03  | 07   |         |                 |        | periods instruments, also   |
|       |        | F      |        | 06  | -    |         |                 |        | recorded on Galitzin Z and  |
|       |        |        |        |     |      |         |                 |        | E. Observed by Met. Office, |
|       |        |        |        |     |      |         |                 |        | Mildenhall and adjacent     |
|       |        |        |        |     |      |         |                 |        | stations.                   |
| 29    | E      | eP     | 04     | 53  | 09   |         |                 | (2100) | Depth of focus probably     |
|       | ZE     | epP    |        | 53  | 47   |         |                 |        | about 200 km.               |
|       | ZE     | eS     |        | 56  | 30   |         |                 |        |                             |
|       | E      | ePcP   |        | 57  | 19   |         |                 |        |                             |
|       | E      | eL     |        | 59  | -    |         |                 |        | Very poorly developed.      |
|       |        | F      | 05     | 15  | -    |         |                 |        |                             |
| 30    | E      | eL     | 14     | 44  | -    |         |                 |        | Traces on Z component.      |
|       |        | F      | 15     | 10  | -    |         |                 |        |                             |
| 31    | E      | e      | 14     | 46  | -    |         |                 |        | Traces on Z component.      |
|       |        | F      | 15     | 10  | -    |         |                 |        | Possibly artificial.        |



**KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.****SEISMOLOGICAL BULLETIN FOR.....JUNE.....19 48**

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)

OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD $T_1$ . | PENDULUM FREE PERIOD $T$ . | DAMPING CONSTANT $\mu^2$ . | $\frac{Ak}{\pi^2}$ |
|------------|----------------------------------|----------------------------------|----------------------------|----------------------------|--------------------|
| N.         |                                  | sec.                             | sec.                       |                            | sec-1              |
| E.         |                                  |                                  |                            |                            |                    |
| Z.         |                                  |                                  |                            |                            |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT.                                 | PHASE.                          | G.M.T. |    |    | PERIOD. | AMPLITUDE. | $\Delta$ | REMARKS.                                  |
|-------|----------------------------------------|---------------------------------|--------|----|----|---------|------------|----------|-------------------------------------------|
|       |                                        |                                 | h.     | m. | s. | sec.    | $\mu$      | km.      |                                           |
| 1     | ZV<br>ZV                               | e<br>e<br>F                     | 14     | 12 | 05 |         |            |          | Small; possibly artificial.               |
|       |                                        |                                 |        | 14 | 16 |         |            |          |                                           |
|       |                                        |                                 |        | 17 | -  |         |            |          |                                           |
| 1     | ZV<br>E<br>ZV<br>ZE                    | e<br>e<br>e<br>eL<br>F          | 19     | 09 | 04 |         |            |          |                                           |
|       |                                        |                                 |        | 19 | 31 |         |            |          |                                           |
|       |                                        |                                 |        | 26 | 08 |         |            |          |                                           |
|       |                                        |                                 |        | 53 | -  |         |            |          |                                           |
|       |                                        |                                 | 20     | 35 | -  |         |            |          |                                           |
| 7     | ZV,E<br>ZV,E<br>ZV<br>ZV<br>ZV<br>ZV,E | e<br>e<br>i<br>i<br>i<br>i<br>F | 07     | 17 | 46 |         |            |          |                                           |
|       |                                        |                                 |        | 18 | 36 |         |            |          |                                           |
|       |                                        |                                 |        | 18 | 48 |         |            |          |                                           |
|       |                                        |                                 |        | 18 | 58 |         |            |          |                                           |
|       |                                        |                                 |        | 19 | 06 |         |            |          |                                           |
|       |                                        |                                 |        | 19 | 16 |         |            |          |                                           |
|       |                                        |                                 |        | 22 | -  |         |            |          |                                           |
| 8     | E                                      | eL<br>F                         | 04     | 07 | -  |         |            |          | Z light failed.                           |
|       |                                        |                                 |        | 26 | -  |         |            |          |                                           |
| 11    | -                                      | -                               | 09     | 22 | to |         |            |          | No records; installing the N-S component. |
|       |                                        |                                 | 14     | 57 | -  |         |            |          |                                           |
| 13    | ZV,Z<br>NE                             | e<br>e<br>F                     | 06     | 38 | 47 |         |            |          | On long and short period Z.               |
|       |                                        |                                 |        | 40 | 22 |         |            |          |                                           |
|       |                                        |                                 |        | 57 | -  |         |            |          |                                           |
| 14    | -                                      | -                               | 09     | 23 | to |         |            |          | Removing Z for overhaul.                  |
|       |                                        |                                 | 15     | 20 | -  |         |            |          |                                           |

SEISMOLOGICAL BULLETIN.

JUNE

19 48

| DATE. | COMPT. | PHASE. | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | Δ      | REMARKS. |
|-------|--------|--------|--------|----|----|---------|-----------------|--------|----------|
|       |        |        | h.     | m. | s. |         | μ               | km.    |          |
| ✓ 15  | ZV     | iP     | 11     | 57 | 30 | 17      | (-20)           | (9120) |          |
|       | ZV     | i      |        | 57 | 48 |         |                 |        |          |
| ZN    | ZV     | e(S)   | 12     | 07 | 50 |         |                 |        |          |
| ZN    | ZV     | e(PS)  |        | 08 | 51 |         |                 |        |          |
|       | N      | e(SS)  |        | 14 | 23 |         |                 |        |          |
|       | N      | e      |        | 18 | 38 |         |                 |        |          |
|       | NE     | eL     |        | 25 | -  |         |                 |        |          |
|       | N      | M      |        | 41 | 17 |         |                 |        |          |
|       |        | F      | 14     | 45 | -  |         |                 |        |          |
| 15    | NE     | e      | 21     | 42 | -  |         |                 |        |          |
|       |        | F      | 22     | 15 | -  |         |                 |        |          |
| 17    | N      | e      | 07     | 02 | -  | 30      | (-4)            |        |          |
|       |        | F      |        | 18 | -  |         |                 |        |          |
| 18    | ZV,N   | i      | 01     | 13 | 02 |         |                 |        |          |
|       | ZV     | i      |        | 15 | 15 |         |                 |        |          |
|       | ZV     | e      |        | 16 | 24 |         |                 |        |          |
|       | ZV,N   | i      |        | 16 | 28 |         |                 |        |          |
|       | ZV     | e      |        | 27 | 48 |         |                 |        |          |
|       | NE     | eL     |        | 54 | -  |         |                 |        |          |
|       | N      | M      | 02     | 04 | 05 |         |                 |        |          |
|       |        | F      | 03     | 25 | -  |         |                 |        |          |
| 18    | ZV     | e      | 07     | 49 | 24 |         |                 |        |          |
|       | N      | eL     | 08     | 05 | -  |         |                 |        |          |
|       |        | F      |        | 35 | -  |         |                 |        |          |
| 18    | -      | -      | 10     | 40 | to |         |                 |        |          |
|       |        |        | 14     | 45 | -  |         |                 |        |          |
| 21    | -      | -      | 13     | 53 | to |         |                 |        |          |
|       |        |        | 14     | 50 | -  |         |                 |        |          |
| 23    | E      | e      | 03     | 49 | 53 |         |                 |        |          |
|       | E      | e      |        | 51 | 20 |         |                 |        |          |
|       | NE     | e      |        | 51 | 29 |         |                 |        |          |
|       | NE     | e      |        | 52 | 49 |         |                 |        |          |
|       |        | F      |        | 57 | -  |         |                 |        |          |
| ✓ 27  | ZV     | e      | 00     | 20 | 09 | 19      | +4              |        |          |
|       | E      | e      |        | 29 | 51 |         |                 |        |          |
|       | E      | e      |        | 38 | 33 |         |                 |        |          |
|       | E      | e      |        | 42 | 23 |         |                 |        |          |
|       | NE     | eL     |        | 48 | -  |         |                 |        |          |
|       | E      | M      |        | 57 | 06 |         |                 |        |          |
|       |        | F      | 01     | 45 | -  |         |                 |        |          |
| 27    | NE     | e      | 07     | 50 | -  |         |                 |        |          |
|       |        | F      | 08     | 10 | -  |         |                 |        |          |
| 27    | ZV     | i      | 13     | 00 | 53 |         |                 |        |          |
|       | E      | e      |        | 03 | 50 |         |                 |        |          |
|       | E      | e      |        | 09 | 19 |         |                 |        |          |
|       | E      | e      |        | 09 | 56 |         |                 |        |          |
|       | NE     | eL     |        | 14 | -  |         |                 |        |          |

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.SEISMOLOGICAL BULLETIN.

JUNE

19 48

| DATE. | COMPT.                                                    | PHASE.                                                                       | G.M.T.                                                                  |                                                                |    | PERIOD.  | AMPLI-<br>TUDE. | $\Delta$ | REMARKS.                          |
|-------|-----------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------|----|----------|-----------------|----------|-----------------------------------|
|       |                                                           |                                                                              | h.                                                                      | m.                                                             | s. | sec.     | $\mu$           | km.      |                                   |
| 27    | E                                                         | M<br>F                                                                       | 13 18<br>14 15                                                          | 57<br>-                                                        |    | 17       | -2              |          |                                   |
| 27    | ZV<br>E<br>E<br>NE<br>E                                   | eP<br>e<br>e(s)<br>eL<br>M<br>F                                              | 21 50<br>59<br>22 00<br>07<br>24<br>23 30                               | 40<br>56<br>11<br>-<br>40<br>-                                 |    | 17       | -2              | (8160)   |                                   |
| ✓28   | ZV<br>ZV<br>ZV<br>EN<br>ZV<br>N<br>NE<br>NE<br>E<br>N     | iP<br>iP <sub>c</sub> P<br>iPP<br>eS<br>iSP<br>eSS<br>e<br>eL<br>M<br>M<br>F | 07 26<br>26<br>29<br>36<br>37<br>40<br>47<br>51<br>08 05<br>07<br>10 10 | 05<br>14<br>20<br>31<br>38<br>05<br>01<br>-<br>01<br>13<br>-   |    | 15<br>14 | +80<br>(+100)   | 9260     |                                   |
| ✓29   | ZV<br>ZV<br>N<br>ZV<br>E<br>NE<br>NE<br>N<br>E            | i<br>i<br>i<br>i<br>e<br>e<br>eL<br>e<br>M<br>F                              | 10 48<br>51<br>51<br>53<br>58<br>11 10<br>38<br>39<br>53<br>13 15       | 05<br>23<br>49<br>21<br>51<br>05<br>-<br>59<br>18<br>-         |    | 20       | +10             |          | eNE.                              |
| 29    | ZV<br>ZV<br>N<br>N<br>N<br>N                              | i<br>i<br>e<br>e<br>e<br>eL<br>F                                             | 16 13<br>13<br>18<br>18<br>20<br>25<br>17 20                            | 01<br>11<br>16<br>38<br>40<br>-<br>-                           |    |          |                 |          | Possibly deeper than normal.      |
| ✓30   | ZV,NE<br>NE<br>N<br>ZV,NE<br>N<br>E<br>NE<br>NE<br>E<br>N | iP<br>iPP<br>i<br>eS<br>e<br>e<br>eL<br>M<br>M<br>F                          | 12 26<br>26<br>26<br>29<br>29<br>30<br>31<br>32<br>33<br>33<br>14 50    | (01)<br>13<br>48<br>38<br>45<br>50<br>44<br>-<br>07<br>11<br>- |    | 14<br>14 | -83<br>(-220)   | 2220     | In minute gap.<br>Large movement. |



## AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

## KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

## SEISMOLOGICAL BULLETIN FOR JULY 19 48

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD $T_1$ | PENDULUM FREE PERIOD $T$ | DAMPING CONSTANT $\mu^2$ | $\frac{Ak}{\pi l}$ |
|------------|----------------------------------|--------------------------------|--------------------------|--------------------------|--------------------|
| N.         |                                  | sec.                           | sec.                     |                          | sec-1              |
| E.         |                                  |                                |                          |                          |                    |
| Z.         |                                  |                                |                          |                          |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT.               | PHASE.             | G.M.T.                                                       | PERIOD. | AMPLITUDE. | $\Delta$ | REMARKS.                                                                                                                       |
|-------|----------------------|--------------------|--------------------------------------------------------------|---------|------------|----------|--------------------------------------------------------------------------------------------------------------------------------|
|       |                      |                    | h. m. s.                                                     | sec.    | $\mu$      | km.      |                                                                                                                                |
| 3     | ZV, E                | eP                 | 13 09 11                                                     |         |            |          | Visible on Galitzin seismograph but very small.                                                                                |
|       | E                    | eF                 | 09 26 15 -                                                   |         |            |          |                                                                                                                                |
| 3     | NE                   | eL F               | 15 53 -<br>16 15 -                                           |         |            |          |                                                                                                                                |
| 5     | ZV, ZV, E NE NE NE E | eP i e(s) e eL M F | 14 01 53<br>01 58 49<br>13 15 53<br>18 -<br>31 09<br>16 00 - | 17      | +10        | (5,320)  | Uccle. $\Delta=4800$ Km.<br>$T_0 = 13.53.31$ G.M.T.                                                                            |
| 7 ✓   | ZV, E NE NE E        | eP eSKS eS L M F   | 02 31 59<br>42 27 59<br>03 03 -<br>16 49<br>04 50 -          | 14      | +11        | 10,030   |                                                                                                                                |
| 8     | ZV, NE ZV, ZV, NE E  | iP eS e eL M F     | 12 39 13<br>42 59 06<br>43 17 -<br>44 -<br>45 42<br>13 15 -  | 15      | 40         | 2330     |                                                                                                                                |
|       |                      |                    |                                                              |         |            |          | Off Southern Coast of Honshu Island, Japan.<br>33°N., 136°E. (U.S.C.G.S.)<br>Near Jan Mayen Land.<br>71°N., 60°W. (U.S.C.G.S.) |

M.O. 502

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

JULY, 19 48

| DATE. | COMPT.                                       | PHASE.                                                           | G.M.T. |     |    | PERIOD. | AMPLI-<br>TUDE. | Δ       | REMARKS.                                                |
|-------|----------------------------------------------|------------------------------------------------------------------|--------|-----|----|---------|-----------------|---------|---------------------------------------------------------|
|       |                                              |                                                                  | h.     | m.  | s. | sec.    | μ               | km.     |                                                         |
| 14/15 | ZV,<br>E<br>N<br>E<br>E<br>E<br>E<br>NE<br>E | eP<br>ePP<br>ePPP<br>eSKS<br>eSS<br>ePPP<br>eSSS<br>eL<br>M<br>F | 22     | 49  | 55 |         |                 | (13500) | New Guinea.<br>4°S., 142°E. (U.S.C.G.S.)                |
|       |                                              |                                                                  |        | 55  | 22 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 57  | 12 |         |                 |         |                                                         |
|       |                                              |                                                                  | 23     | 00  | 20 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 10  | 24 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 12  | 46 |         |                 |         | by path >1800                                           |
|       |                                              |                                                                  |        | 14  | 06 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 26  | -  |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 38  | 12 | 18      | +10             |         |                                                         |
|       |                                              |                                                                  | 01     | 55  | -  |         |                 |         |                                                         |
| 15    | E<br>E<br>E                                  | e(SKS)<br>e(SS)<br>eL<br>F                                       | 11     | 26  | 32 |         |                 |         | Pacific Ocean.<br>10°N., 104°W. (U.S.C.G.S.)            |
|       |                                              |                                                                  |        | 32  | 16 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 44  | -  |         |                 |         |                                                         |
|       |                                              |                                                                  | 13     | 25  | -  |         |                 |         |                                                         |
| 16    | E<br>E<br>E<br>E<br>E                        | e(S)<br>e<br>e(SS)<br>eL<br>M<br>F                               |        | 41  | 41 |         |                 |         | Near coast of Guatemala.<br>14½°N., 92°W. (U.S.C.G.S.)  |
|       |                                              |                                                                  |        | 42  | 52 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 46  | 32 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 50  | -  |         |                 |         |                                                         |
|       |                                              |                                                                  | 08     | 02  | 22 | 22      | -6              |         |                                                         |
|       |                                              |                                                                  | 09     | 10  | -  |         |                 |         |                                                         |
| 16    | -                                            | -                                                                | 15h    | 22m | to |         |                 |         | No records.                                             |
|       |                                              |                                                                  | 16     | 25  | -  |         |                 |         |                                                         |
| 17    | -                                            | -                                                                | 13     | 28  | to |         |                 |         | Visits to pit by Met.<br>Association.                   |
|       |                                              |                                                                  | 17     | 25  | -  |         |                 |         |                                                         |
| 18    | ZV,E<br>F                                    | e<br>F                                                           | 07     | 44  | -  |         |                 |         | Short period records only.                              |
|       |                                              |                                                                  | 08     | 25  | -  |         |                 |         |                                                         |
| 19    | ZV,<br>N<br>ZV,<br>ZV,N<br>N<br>E<br>N       | e<br>e<br>i<br>e<br>e<br>e<br>e<br>F                             | 18     | 16  | 30 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 16  | 45 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 17  | 00 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 17  | 48 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 32  | 06 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 33  | 06 |         |                 |         | L waves very poorly<br>developed.                       |
|       |                                              |                                                                  |        | 41  | 12 |         |                 |         |                                                         |
|       |                                              |                                                                  | 19     | 50  | -  |         |                 |         |                                                         |
| 20    | E                                            | eL<br>F                                                          | 01     | 50  | -  |         |                 |         |                                                         |
|       |                                              |                                                                  | 03     | 10  | -  |         |                 |         |                                                         |
| ✓ 20  | ZV,E<br>E<br>E<br>E<br>NE<br>E<br>NE<br>E    | eP<br>e(SKS)<br>e(PS)<br>e<br>e<br>e<br>eL<br>M<br>F             | 11     | 15  | 45 |         |                 |         | Off SW coast of Peru.<br>17°S., 74½°W. (U.S.C.G.S.)     |
|       |                                              |                                                                  |        | 26  | 19 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 28  | 26 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 30  | 32 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 35  | 45 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 40  | 32 |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 47  | -  |         |                 |         |                                                         |
|       |                                              |                                                                  |        | 53  | 05 | 20      | +30             |         |                                                         |
|       |                                              |                                                                  | 13(15) | -   | -  |         |                 |         | Components out of<br>action; installing Z to<br>16.00h. |

M.O...502.....

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

JULY.....19 48..

| DATE. | COMPT.                                                    | PHASE.                                                           | G.M.T.                                         |                                                                      |                                                                        | PERIOD. | AMPLI-<br>TUDE | Δ    | REMARKS.                                            |
|-------|-----------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------|---------|----------------|------|-----------------------------------------------------|
|       |                                                           |                                                                  | h.                                             | m.                                                                   | s.                                                                     | sec.    | μ              | km.  |                                                     |
| 22    | NE                                                        | eL<br>F                                                          | 18                                             | 05<br>45                                                             | -<br>-                                                                 |         |                |      |                                                     |
| 22    | E                                                         | eL<br>F                                                          | 20<br>21                                       | 40<br>00                                                             | -<br>-                                                                 |         |                |      |                                                     |
| 22    | E                                                         | eL<br>F                                                          | 21                                             | 28<br>45                                                             | -<br>-                                                                 |         |                |      |                                                     |
| 23    |                                                           | eL<br>F                                                          | 20                                             | 26<br>40                                                             | -<br>-                                                                 |         |                |      | Very small.                                         |
| 23    | N<br>NE<br>NE                                             | e<br>e<br>eL<br>F                                                | 21<br><br>22                                   | 10<br>18<br>22<br>05                                                 | -<br>04<br>-<br>-                                                      |         |                |      |                                                     |
| 24    | ZNE<br>ZNE<br>Z<br>N<br>ZE<br>E<br>ZE<br>E<br>Z<br>E<br>E | iP<br>iPP<br>i<br>iS<br>i<br>i<br>e<br>eLQ<br>i<br>eLR<br>M<br>F | 06<br><br><br><br><br><br><br><br><br>06<br>08 | 08<br>08<br>10<br>12<br>12<br>14<br>16<br>17<br>17<br>19<br>19<br>35 | 30<br>59<br>59<br>43<br>58<br>34<br>09<br>-<br>21<br>-<br>-<br>26<br>- | 22      | +85            | 2670 | Near SW coast of Crete<br>35°N., 24°E. (U.S.C.G.S.) |
| 25    | N                                                         | eL<br>F                                                          | 01<br>02                                       | 25<br>25                                                             | -<br>-                                                                 |         |                |      | Very small.                                         |
| 26    | NE                                                        | e<br>F                                                           | 13<br>14                                       | 35<br>00                                                             | -<br>-                                                                 |         |                |      | Very small.                                         |
| 26    | NE                                                        | e<br>F                                                           | 20<br>22                                       | 01<br>30                                                             | -<br>-                                                                 |         |                |      |                                                     |
| 27    | NE                                                        | e<br>F                                                           | 06                                             | 12<br>30                                                             | -<br>-                                                                 |         |                |      |                                                     |
| 29    | NE                                                        | e<br>F                                                           | 00<br>02                                       | 55<br>10                                                             | -<br>-                                                                 |         |                |      |                                                     |
| 30    | ZV,<br>N<br>N<br>N<br>N                                   | e<br>e<br>e<br>e<br>eL<br>F                                      | 03<br><br><br><br>04                           | 37<br>47<br>48<br>50<br>53<br>25                                     | 57<br>21<br>04<br>35<br>-<br>-                                         |         |                |      | Short period.                                       |



## AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

## KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

## SEISMOLOGICAL BULLETIN FOR AUGUST 1948.

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

 CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
 OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD $T_1$ . | PENDULUM FREE PERIOD $T$ . | DAMPING CONSTANT $\mu^2$ . | $\frac{Ak}{\pi l}$ |
|------------|----------------------------------|----------------------------------|----------------------------|----------------------------|--------------------|
| N.         |                                  | sec.                             | sec.                       |                            | sec <sup>-1</sup>  |
| E.         |                                  |                                  |                            |                            |                    |
| Z.         |                                  |                                  |                            |                            |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT.                            | PHASE.                                      | G.M.T.                                                                      | PERIOD. | AMPLITUDE. | $\Delta$ | REMARKS.                                                                                  |
|-------|-----------------------------------|---------------------------------------------|-----------------------------------------------------------------------------|---------|------------|----------|-------------------------------------------------------------------------------------------|
|       |                                   |                                             | h. m. s.                                                                    | sec.    | $\mu$      | km.      |                                                                                           |
| 1     | E.                                | e<br>F                                      | 19 46 -<br>20 30 -                                                          |         |            |          |                                                                                           |
| 5     | E                                 | e<br>F                                      | 00 08 -<br>28 -                                                             |         |            |          | Very small.                                                                               |
| 5     | E                                 | e<br>F                                      | 22 55 -<br>23 10 -                                                          |         |            |          | Very small; possibly not seismic.                                                         |
| 7     | Z<br>Z<br>E<br>NF<br>E<br>E<br>E  | eP<br>e<br>eS<br>e<br>e<br>eL<br>M<br>F     | 14 53 09<br>57 23<br>15 03 29<br>03 45<br>03 05<br>23 -<br>32 44<br>17 15 - | 19      | +13        | 9160     | Off Honshu Island, Japan.<br>34°N, 142°E.<br>(U.S.C.G.S.)                                 |
| 8     | N                                 | e<br>F                                      | 01 45 -<br>02 20 -                                                          |         |            |          |                                                                                           |
| 9     | Z<br>N<br>ZN                      | e<br>e<br>eL<br>F                           | 03 32 18<br>35 54<br>41 -<br>04 00 -                                        |         |            |          | Very small.                                                                               |
| ✓ 11  | Z<br>EZ<br>EZ<br>E<br>E<br>E<br>E | 1P<br>1S<br>1PS<br>eSS<br>e<br>eL<br>M<br>F | 10 48 20<br>58 11<br>58 30<br>11 03 27<br>07 55<br>11 -<br>22 23<br>12 10 - | 22      | -12        | 8550     | N-S defective. Southern Mexico. Felt in State of Vera Cruz. 17½°N, 95½°W.<br>(U.S.C.G.S.) |

M.O.....502.....

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

AUGUST.....19 18

| DATE. | COMPT. | PHASE. | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | Δ     | REMARKS.                                    |
|-------|--------|--------|--------|----|----|---------|-----------------|-------|---------------------------------------------|
|       |        |        | h.     | m. | s. |         | μ               | km.   |                                             |
| 12/13 | NE     | e      | 23     | 00 | 22 |         |                 |       |                                             |
|       | E      | eL     |        | 16 | -  |         |                 |       |                                             |
|       |        | F      | 00     | 20 | -  |         |                 |       |                                             |
| 14    | NE     | eL     | 17     | 25 | -  |         |                 |       |                                             |
|       |        | F      | 18     | 20 | -  |         |                 |       |                                             |
| 17    | NE     | e      | 17     | 42 | -  |         |                 |       |                                             |
|       |        | eL     |        | 55 | -  |         |                 |       |                                             |
|       |        | F      | 18     | 30 | -  |         |                 |       |                                             |
| 17    | NE     | e      | 19     | 51 | -  |         |                 |       |                                             |
|       |        | F      | 20     | 22 | -  |         |                 |       |                                             |
| 18    | NE     | e      | 19     | 18 | -  |         |                 |       | Very small.                                 |
|       |        | F      |        | 40 | -  |         |                 |       |                                             |
| 18    | ZV,    | eP     | 21     | 16 | 07 |         |                 | 2880  |                                             |
|       | ZNE    | eS     |        | 20 | 35 |         |                 |       |                                             |
|       | ZV,E   | e      |        | 21 | 01 |         |                 |       |                                             |
|       | Z,E    | e(SS)  |        | 21 | 14 |         |                 |       |                                             |
|       | Z,E    | eL     |        | 22 | -  |         |                 |       |                                             |
|       | E      | M      |        | 23 | 09 | 13      | +8              |       |                                             |
|       |        | F      |        | 40 | -  |         |                 |       |                                             |
|       |        |        |        |    |    |         |                 |       |                                             |
| 19    | E      | e      | 01     | 43 | 04 |         |                 |       |                                             |
|       | NE     | eL     | 02     | 00 | -  |         |                 |       |                                             |
|       |        | F      |        | 45 | -  |         |                 |       |                                             |
| 19    | ZV,Z,E | eP     | 20     | 11 | 18 |         |                 | 8910  | South of Panama.<br>50N, 820W. (U.S.C.G.S.) |
|       | ZV,    | e      |        | 11 | 33 |         |                 |       |                                             |
|       | E      | eS     |        | 21 | 27 |         |                 |       |                                             |
|       | E      | e(PS)  |        | 22 | 21 |         |                 |       |                                             |
|       | E      | eL     |        | 35 | -  |         |                 |       |                                             |
|       |        | F      | 21     | 18 | -  |         |                 |       |                                             |
|       |        |        |        |    |    |         |                 |       |                                             |
| 20    | ZNE    | e      | 19     | 32 | -  |         |                 |       |                                             |
|       |        | F      | 20     | 20 | -  |         |                 |       |                                             |
| 21    | ZV,    | e(P)   | 08     | 48 | 24 |         |                 |       |                                             |
|       | NE     | e      |        | 53 | 20 |         |                 |       |                                             |
|       | NE     | L      |        | 54 | -  |         |                 |       |                                             |
|       |        | F      | 09     | 06 | -  |         |                 |       |                                             |
| 22    | ZV,    | iP     | 23     | 20 | 01 |         |                 |       | Very small;<br>confused by microseisms.     |
|       | ZV,E   | i      |        | 22 | 40 |         |                 |       |                                             |
|       | ZV,E   | e      |        | 23 | 10 |         |                 |       |                                             |
|       | E      | e      |        | 24 | 50 |         |                 |       |                                             |
|       |        | F      |        | 30 | -  |         |                 |       |                                             |
| 25    | ZV,ZNE | iP     | 06     | 22 | 44 |         |                 | 11000 |                                             |
|       | ZV,ZNE | iPp    |        | 22 | 56 |         |                 |       |                                             |
|       | ZV     | i      |        | 23 | 43 |         |                 |       |                                             |
|       | ZV,ZNE | iPP    |        | 26 | 31 |         |                 |       |                                             |
|       | ZV,ZNE | i      |        | 26 | 38 |         |                 |       |                                             |
|       | NE     | eS     |        | 33 | 20 |         |                 |       |                                             |
|       | NE     | ess    |        | 33 | 33 |         |                 |       |                                             |
|       | N      | e      |        | 33 | 59 |         |                 |       |                                             |
|       |        |        |        |    |    |         |                 |       |                                             |

M.O. 502

# KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

## SEISMOLOGICAL BULLETIN.

AUGUST 19 48

| DATE. | COMPT. | PHASE. | G.M.T. |    |      | PERIOD. | AMPLI-<br>TUDE. | $\Delta$ | REMARKS.             |
|-------|--------|--------|--------|----|------|---------|-----------------|----------|----------------------|
|       |        |        | h.     | m. | s.   |         | $\mu$           | km.      |                      |
| ✓ 25  | ZV,Z   | e      | 06     | 34 | 48   |         |                 |          |                      |
|       | NE     | ePS    |        | 35 | 13   |         |                 |          |                      |
|       | NE     | ePPS   |        | 35 | 34   |         |                 |          |                      |
|       | ZNE    | eSS    |        | 40 | 37   |         |                 |          |                      |
|       | NE     | eSSS   |        | 44 | 33   |         |                 |          |                      |
|       | ZNE    | eL     |        | 47 | -    |         |                 |          |                      |
|       | E      | M      | 07     | 09 | 35   | 17      | +45             |          |                      |
|       |        | F      | 10     | 15 | -    |         |                 |          |                      |
| 26    | NE     | e      | 15     | 16 | -    |         |                 |          |                      |
|       | N      | eL     |        | 23 | -    |         |                 |          |                      |
|       |        | F      |        | 55 | -    |         |                 |          |                      |
| 27    | ZV,Z   | iP     | 10     | 48 | 06   |         |                 | 1970     |                      |
|       | Z      | i      |        | 49 | 09   |         |                 |          |                      |
|       | NE     | eS     |        | 51 | 21   |         |                 |          |                      |
|       | NE     | e(L)   |        | 53 | (10) |         |                 |          |                      |
|       |        | F      | 11     | 28 | ±    |         |                 |          |                      |
| 27    | ZV,    | eP     | 17     | 02 | 47   |         |                 | (10335)  | Very small.          |
|       | NE     | e(S)   |        | 12 | 00   |         |                 |          |                      |
|       | NE     | e      |        | 12 | 55   |         |                 |          |                      |
|       |        | F      |        | 30 | -    |         |                 |          |                      |
| 28    | ZV,Z   | eP     | 02     | 39 | 31   |         |                 | 9000     |                      |
|       | NE     | eS     |        | 49 | 44   |         |                 |          |                      |
|       | NE     | e      |        | 53 | 20   |         |                 |          |                      |
|       | NE     | eL     | 03     | 03 | -    |         |                 |          |                      |
|       | E      | M      |        | 14 | 42   | 16      | +5              |          |                      |
|       |        | F      | 04     | 25 | -    |         |                 |          |                      |
| 28    | NE     | eL     | 13     | 40 | -    |         |                 |          |                      |
|       |        | F      | 14     | 50 | -    |         |                 |          |                      |
| 29    | ZV,Z   | i      | 17     | 57 | 20   |         |                 |          |                      |
|       | N      | e      | 18     | 00 | 42   |         |                 |          |                      |
|       | ZV,    | e      |        | 02 | 30   |         |                 |          |                      |
|       | N      | i      |        | 05 | 20   |         |                 |          |                      |
|       | N      | e      |        | 07 | 14   |         |                 |          |                      |
|       | N      | i      |        | 17 | 25   |         |                 |          |                      |
|       | NE     | eL     |        | 36 | -    |         |                 |          |                      |
|       |        | F      | 20     | 20 | -    |         |                 |          |                      |
| 29/30 | N      | e      | 23     | 53 | 12   |         |                 |          |                      |
|       | N      | e      |        | 54 | 18   |         |                 |          |                      |
|       | NE     | eL     | 00     | 12 | -    |         |                 |          |                      |
|       | E      | M      |        | 21 | 42   | 17      | +4              |          |                      |
|       |        | F      |        | 35 | -    |         |                 |          |                      |
| 30    | NE     | e      | 01     | 45 | 37   |         |                 |          |                      |
|       | NE     | eL     |        | 47 | -    |         |                 |          |                      |
|       |        | F      | 02     | 10 | -    |         |                 |          |                      |
| 30    | -      | -      | 08     | 58 | -to  |         |                 |          | Removed E-W pendulum |
|       |        |        | 10     | 07 | -    |         |                 |          | for overhaul.        |



AIR MINISTRY, METEOROLOGICAL OFFICE,

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR SEPTEMBER 19 48

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD $T_1$ | PENDULUM FREE PERIOD $T$ | DAMPING CONSTANT $\mu^2$ | $\frac{Ak}{\pi l}$ |
|------------|----------------------------------|--------------------------------|--------------------------|--------------------------|--------------------|
| N.         |                                  | sec.                           | sec.                     |                          | sec-1              |
| E.         |                                  |                                |                          |                          |                    |
| Z.         |                                  |                                |                          |                          |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.  
TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.  
SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT.                                           | PHASE.                                     | G.M.T.                                                                            | PERIOD. | AMPLI-TUDE. | $\Delta$ | REMARKS.                 |
|-------|--------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------|---------|-------------|----------|--------------------------|
|       |                                                  |                                            | h. m. s.                                                                          | sec.    | $\mu$       | km.      |                          |
| 1     |                                                  | e<br>F                                     | 00 39 -<br>01 55 -                                                                |         |             |          |                          |
| 1     | ZN                                               | eL<br>F                                    | 19 55 -<br>22 05 -                                                                |         |             |          |                          |
| 2/3   | N<br>N<br>N<br>N<br>N<br>N                       | e<br>e<br>e<br>i<br>eL<br>M<br>F           | 23 59 21<br>00 00 19<br>10 33<br>15 49<br>18 (13)<br>31 22<br>02 15 -             | 24      | (+140)      |          | Confused by microseisms. |
| 4     | ZN<br>N<br>N<br>N<br>N<br>N                      | e<br>e<br>e<br>eL<br>M<br>F                | 15 33 (05)<br>35 41<br>41 07<br>55 -<br>16 11 18<br>18 -                          | 17      | (-12)       |          |                          |
| 6     | N<br>N<br>N                                      | e<br>eL<br>M<br>F                          | 08 30 06<br>52<br>09 03 17<br>10 50 -                                             | 20      | (+10)       |          |                          |
| 7     | ZV,E<br>ZV,E<br>ZV,<br>ZV,E<br>NE<br>N<br>N<br>N | i<br>i<br>i<br>i<br>i<br>e<br>e<br>eL<br>F | 08 24 06<br>24 49<br>25 10<br>27 05<br>31 10<br>35 22<br>35 42<br>40 -<br>09 10 - |         |             |          | Probably deep focus.     |

M.O.502.....

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

SEPTEMBER19 48.....

| DATE. | COMPT. | PHASE.            | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | Δ       | REMARKS.                                                         |
|-------|--------|-------------------|--------|----|----|---------|-----------------|---------|------------------------------------------------------------------|
|       |        |                   | h.     | m. | s. |         | μ               | km.     |                                                                  |
| 7     |        | e<br>F            | 15     | 55 | -  |         |                 |         | Possibly not seismic.                                            |
|       |        |                   | 16     | 15 | -  |         |                 |         |                                                                  |
| ✓ 8   | ZNE    | iPKP <sub>1</sub> | 15     | 28 | 59 |         |                 | (16700) | Tonga Islands region.<br>21°S.,174°W. (U.S.C.G.S.)<br><br>Large. |
|       | ZN     | iPKP <sub>2</sub> |        | 29 | 34 |         |                 |         |                                                                  |
|       | ZNE    | iPP               |        | 32 | 23 |         |                 |         |                                                                  |
|       | NE     | eSKSP             |        | 42 | 49 |         |                 |         |                                                                  |
|       | NE     | e                 |        | 43 | 07 |         |                 |         |                                                                  |
|       | E      | eSS               |        | 51 | 37 |         |                 |         |                                                                  |
|       | E      | eSSP              |        | 53 | 01 |         |                 |         |                                                                  |
|       | N      | eSSS              |        | 54 | 39 |         |                 |         |                                                                  |
|       | NE     | e                 |        | 57 | 23 |         |                 |         |                                                                  |
|       | E      | e                 | 16     | 10 | 39 |         |                 |         |                                                                  |
|       | ZNE    | eL                |        | 18 | -  |         |                 |         |                                                                  |
|       | N      | M                 |        | 32 | 26 | 26      | (+675)          |         |                                                                  |
|       |        | F                 | 21     | 45 | -  |         |                 |         |                                                                  |
| 10    | N      | e<br>F            | 02     | 55 |    |         |                 |         | Very small.                                                      |
|       |        |                   | 03     | 05 |    |         |                 |         |                                                                  |
| 10    | N      | e<br>F            | 07     | 04 |    |         |                 |         |                                                                  |
|       |        |                   |        | 10 |    |         |                 |         |                                                                  |
| 10    | N      | e<br>F            | 12     | 22 | -  |         |                 |         | Possibly not seismic.                                            |
|       |        |                   |        | 55 | -  |         |                 |         |                                                                  |
| ✓ 10  | ZNE    | iP                | 14     | 00 | 49 |         |                 | 8935    | Off E.coast of Hokkaido,<br>Japan. 44°N.,146½°E.<br>(U.S.C.G.S.) |
|       | Z      | i(pP)             |        | 01 | 01 |         |                 |         |                                                                  |
|       | Z      | i                 |        | 01 | 12 |         |                 |         |                                                                  |
|       | ZN     | ePP               |        | 04 | 06 |         |                 |         |                                                                  |
|       | N      | e                 |        | 07 | 03 |         |                 |         |                                                                  |
|       | ZNE    | iS                |        | 10 | 59 |         |                 |         |                                                                  |
|       | N      | iS <sub>c</sub> S |        | 11 | 14 |         |                 |         |                                                                  |
|       | ZN     | iPS               |        | 11 | 33 |         |                 |         |                                                                  |
|       | N      | eSS               |        | 16 | 01 |         |                 |         |                                                                  |
|       | ZN     | i                 |        | 17 | 18 |         |                 |         |                                                                  |
|       | NE     | eL                |        | 25 |    |         |                 |         |                                                                  |
|       | N      | M                 |        | 34 | 05 | 26      | (+140)          |         |                                                                  |
|       |        | F                 | 18     | 10 | -  |         |                 |         |                                                                  |
| 11    | N      | e<br>F            | 00     | 44 | -  |         |                 |         | Very small.                                                      |
|       |        |                   | 01     | 05 | -  |         |                 |         |                                                                  |
| 11    | N      | e<br>F            | 01     | 56 | -  |         |                 |         |                                                                  |
|       |        |                   | 03     | 05 | -  |         |                 |         |                                                                  |
| 11    | ZNE    | e                 | 08     | 57 | 46 |         |                 |         | Deep focus.                                                      |
|       | ZNE    | e                 |        | 57 | 59 |         |                 |         |                                                                  |
|       | Z      | e                 |        | 58 | 45 |         |                 |         |                                                                  |
|       | ZNE    | e                 | 09     | 01 | 23 |         |                 |         |                                                                  |
|       | ZNE    | e                 |        | 01 | 45 |         |                 |         |                                                                  |
|       | ZNE    | e                 |        | 02 | 05 |         |                 |         |                                                                  |
|       | ZNE    | e                 |        | 02 | 29 |         |                 |         |                                                                  |
|       | N      | e(L)<br>F         | 04     | -  |    |         |                 |         | Very poorly developed.                                           |
|       |        |                   | (30)   |    |    |         |                 |         |                                                                  |

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

SEPTEMBER 1948

| DATE.   | COMPT.                           | PHASE.                                 | G.M.T.      |          |            | PERIOD. | AMPLI-<br>TUDE. | Δ    | REMARKS.                    |
|---------|----------------------------------|----------------------------------------|-------------|----------|------------|---------|-----------------|------|-----------------------------|
|         |                                  |                                        | h.          | m.       | s.         |         | μ               | km.  |                             |
| 12      | Z<br>Z<br>Z<br>N<br>N            | e<br>i<br>i<br>e<br>eL<br>F            | 03          | 39       | 33         |         |                 |      |                             |
|         |                                  |                                        |             | 39       | 41         |         |                 |      |                             |
|         |                                  |                                        |             | 40       | 03         |         |                 |      |                             |
|         |                                  |                                        | 04          | 12       | -          |         |                 |      |                             |
|         |                                  |                                        |             | 35       | -          |         |                 |      |                             |
|         |                                  |                                        | 05          | 30       | -          |         |                 |      |                             |
| 19      | Z<br>NE                          | e(P)<br>eL<br>F                        | 06          | 25       | 59         |         |                 |      |                             |
|         |                                  |                                        |             | 53       | -          |         |                 |      |                             |
|         |                                  |                                        | 07          | 45       | -          |         |                 |      |                             |
| 20      |                                  | -<br>-                                 | 09<br>(16)  | 52<br>51 | to<br>-    |         |                 |      | No records;<br>adjusting Z. |
| 20      | ZV,<br>ZV,<br>NE                 | i(P)<br>i<br>eL<br>F                   | 18          | 05       | 23         |         |                 |      |                             |
|         |                                  |                                        |             | 05       | 44         |         |                 |      |                             |
|         |                                  |                                        |             | 10       | -          |         |                 |      |                             |
|         |                                  |                                        |             | 28       | -          |         |                 |      |                             |
| 21      |                                  | -<br>-                                 | (12<br>(16) | 49<br>42 | to<br>-    |         |                 |      | No records;<br>adjusting Z. |
| 21      | N<br>N<br>N<br>NE<br>N           | e(S)<br>e(SS)<br>e<br>eL<br>M<br>F     | 17<br>18    | 57<br>02 | (18)<br>44 |         |                 |      |                             |
|         |                                  |                                        |             | 03       | 46         |         |                 |      |                             |
|         |                                  |                                        |             | 05       | (18)       |         |                 |      |                             |
|         |                                  |                                        |             | 17       | 15         | 15      | (+40)           |      |                             |
|         |                                  |                                        |             | 30       | -          |         |                 |      |                             |
| ✓ 23    | ZV,<br>ZV,<br>NE<br>N<br>NE<br>N | eP<br>ePP<br>eS<br>ePS<br>eL<br>M<br>F | 01          | 05       | 01         |         |                 | 9000 |                             |
|         |                                  |                                        |             | 08       | 04         |         |                 |      |                             |
|         |                                  |                                        |             | 15       | 14         |         |                 |      |                             |
|         |                                  |                                        |             | 15       | 44         |         |                 |      |                             |
|         |                                  |                                        |             | 33       | -          |         |                 |      |                             |
|         |                                  |                                        |             | 41       | 25         | 21      | (+17)           |      |                             |
|         |                                  |                                        | 02          | 30       | -          |         |                 |      |                             |
| 24      | NE                               | e<br>F                                 | 16<br>17    | 55<br>25 | -<br>-     |         |                 |      |                             |
| 24      | NE<br>NE<br>N                    | e<br>eL<br>M<br>F                      | 21          | 09       | 12         |         |                 |      |                             |
|         |                                  |                                        |             | 42       | -          |         |                 |      |                             |
|         |                                  |                                        |             | 57       | 21         | 20      | (+9)            |      |                             |
|         |                                  |                                        | 23          | 10       | -          |         |                 |      |                             |
| ✓ 24/25 | Z<br>ZN<br>ZNE<br>N              | e(PP)<br>eS<br>eL<br>M<br>F            | 23          | 45       | (40)       |         |                 |      |                             |
|         |                                  |                                        |             | 52       | 28         |         |                 |      |                             |
|         |                                  |                                        | 00          | 12       | -          |         |                 |      |                             |
|         |                                  |                                        |             | 19       | 19         | 20      | (+11)           |      |                             |
|         |                                  |                                        | 01          | 25       | -          |         |                 |      |                             |
| 25      | NE                               | eL<br>F                                | 04          | 04       | -          |         |                 |      |                             |
|         |                                  |                                        |             | 45       | -          |         |                 |      |                             |

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.SEISMOLOGICAL BULLETIN.SEPTEMBER 19 48

| DATE. | COMPT. | PHASE. | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | $\Delta$ | REMARKS.                 |
|-------|--------|--------|--------|----|----|---------|-----------------|----------|--------------------------|
|       |        |        | h.     | m. | s. |         |                 |          |                          |
| 26    | Z      | e      | 01     | 18 | 30 | sec.    | $\mu$           | km.      | Probably deep focus.     |
|       | Z      | e      |        | 19 | 02 |         |                 |          |                          |
|       | Z      | e      |        | 21 | 02 |         |                 |          |                          |
|       | Z      | e      |        | 21 | 30 |         |                 |          |                          |
|       | Z      | e      |        | 21 | 46 |         |                 |          |                          |
|       | ZN     | e      |        | 22 | 42 |         |                 |          |                          |
|       | ZN     | eL     |        | 58 | -  |         |                 |          |                          |
|       | ZN     | F      | 03     | 00 | -  |         |                 |          |                          |
| 26    | ZN     | eL     | 08     | 30 | -  |         |                 |          |                          |
|       |        | F      |        | 50 | -  |         |                 |          |                          |
| 28    | ZV,E   | 1P     | 21     | 48 | 25 | 18      | (+70)           | 8280     | Confused by microseisms. |
|       | ZV,    | ePP    |        | 51 | 08 |         |                 |          |                          |
|       | ZV,E   | e(PPP) |        | 54 | 21 |         |                 |          |                          |
|       | ZV,NE  | eS     |        | 58 | 02 |         |                 |          |                          |
|       | NE     | eSKS   |        | 58 | 40 |         |                 |          |                          |
|       | NE     | eSS    | 22     | 02 | 49 |         |                 |          |                          |
|       | E      | e      |        | 03 | 20 |         |                 |          |                          |
|       | NE     | i(SSS) |        | 07 | 08 |         |                 |          |                          |
|       | NE     | e      |        | 16 | 11 |         |                 |          |                          |
|       | E      | i      |        | 16 | 59 |         |                 |          |                          |
|       | NE     | eL     |        | 19 | -  |         |                 |          |                          |
|       | N      | M      |        | 21 | 43 |         |                 |          |                          |
|       |        | F      | 23     | 25 | -  |         |                 |          |                          |
| 30    | E      | eL     | 03     | 18 | -  |         |                 |          |                          |
|       |        | F      | 04     | 15 | -  |         |                 |          |                          |
| 30    | ZE     | e      | 19     | 40 | -  |         |                 |          |                          |
|       |        |        |        | 55 | -  |         |                 |          |                          |

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON. 27 DEC 1948

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.SEISMOLOGICAL BULLETIN FOR OCTOBER 1948

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD<br>T<br>l. | PENDULUM FREE PERIOD<br>T. | DAMPING CONSTANT<br>$\mu^2$ . | $\frac{Ak}{\pi^2}$ |
|------------|----------------------------------|-------------------------------------|----------------------------|-------------------------------|--------------------|
| N.         |                                  | sec.                                | sec.                       |                               | sec-l              |
| E.         |                                  |                                     |                            |                               |                    |
| Z.         |                                  |                                     |                            |                               |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT.                                                             | PHASE.                                                        | G.M.T.                                                                                              | PERIOD.  | AMPLITUDE.       | $\Delta$ | REMARKS.                                                         |
|-------|--------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------|------------------|----------|------------------------------------------------------------------|
|       |                                                                    |                                                               | h. m. s.                                                                                            | sec.     | $\mu$            | km.      |                                                                  |
| 1     | NE<br>Z                                                            | eL<br>eL<br>F                                                 | 03 54 -<br>04 02 -<br>25 -                                                                          |          |                  |          |                                                                  |
| 1     | ZN                                                                 | e<br>F                                                        | 22 19 -<br>30 -                                                                                     |          |                  |          | Very small.                                                      |
| 2     | ZNE                                                                | eL<br>F                                                       | 15 50 -<br>16 20 -                                                                                  |          |                  |          |                                                                  |
| 3     |                                                                    | e<br>F                                                        | 01 39 -<br>45 -                                                                                     |          |                  |          | Possibly not seismic.                                            |
| ✓ 4   | ZV, Z<br>NE<br>E<br>NE<br>Z<br>N                                   | i<br>e<br>e<br>eL<br>eL<br>M<br>F                             | 06 09 50<br>20 16<br>20 50<br>41 -<br>46 -<br>52 51<br>07 55 -                                      | 22       | (+31)            |          |                                                                  |
| ✓ 5/6 | ZV, ZNE<br>ZV, ZNE<br>ZNE<br>ZNE<br>E<br>ZV<br>ZV<br>ZNE<br>N<br>N | iP<br>ePP<br>ePPP<br>eS<br>i<br>iSS<br>i<br>eL<br>M<br>M<br>F | 20 20 06<br>21 44<br>22 50<br>26 35<br>26 41<br>29 30<br>31 48<br>33 -<br>47 21<br>56 34<br>01 05 - | 19<br>15 | (+340)<br>(+240) | 4870     | Destructive around Askhabad, U.S.S.R. 38°N., 58°E. (U.S.C.G.S.). |

20



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# **KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.**

## **SEISMOLOGICAL BULLETIN.**

OCTOBER 19 48

| DATE. | COMPT. | PHASE.  | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | Δ    | REMARKS.                 |
|-------|--------|---------|--------|----|----|---------|-----------------|------|--------------------------|
|       |        |         | h.     | m. | s. | sec.    | μ               | km.  |                          |
| 6     | ZV,ZE  | iP      | 01     | 32 | 44 |         |                 | 4843 |                          |
|       | ZV,Z   | ePP     |        | 34 | 32 |         |                 |      |                          |
|       | ZNE    | eS      |        | 39 | 11 |         |                 |      |                          |
|       | ZNE    | eSS     |        | 42 | 16 |         |                 |      |                          |
|       | ZNE    | eL      |        | 47 | -  |         |                 |      |                          |
|       | N      | M       |        | 53 | 38 | 18      | (+5)            |      |                          |
|       |        | F       | 02     | 20 | -  |         |                 |      |                          |
| 8     | ZNE    | eL      | 19     | 39 | -  |         |                 |      |                          |
|       |        | F       | 20     | 15 | -  |         |                 |      |                          |
| 10    | ZNE    | eL      | 02     | 45 | -  |         |                 |      |                          |
|       |        | F       | 03     | 20 | -  |         |                 |      |                          |
| 10    | ZV,Z   | iP      | 17     | 48 | 14 |         |                 | 2765 |                          |
|       | NE     | eS      |        | 52 | 34 |         |                 |      |                          |
|       | ZNE    | i       |        | 52 | 42 |         |                 |      |                          |
|       | ZNE    | eL      |        | 55 | -  |         |                 |      |                          |
|       | N      | M       |        | 58 | 02 | 14      | (+51)           |      |                          |
|       |        | F       | 18     | 25 | -  |         |                 |      |                          |
| 15/16 | ZN     | e       | 23     | 13 | 00 |         |                 |      |                          |
|       | ZN     | e       |        | 18 | 54 |         |                 |      |                          |
|       | ZNE    | eL      |        | 22 | -  |         |                 |      |                          |
|       | N      | M       |        | 48 | 00 | 18      | (+13)           |      |                          |
|       |        | F       | 01     | 20 | -  |         |                 |      |                          |
| 19    | N      | eL      | 01     | 17 | -  |         |                 |      | Confused by microseisms. |
|       |        | F       |        | 24 | -  |         |                 |      |                          |
| 21    | Z      | e       | 05     | 00 | 08 |         |                 |      |                          |
|       | Z      | e       |        | 23 | 20 |         |                 |      |                          |
|       | NE     | e       |        | 24 | 24 |         |                 |      |                          |
|       | ZNE    | eL      | 06     | 08 | -  |         |                 |      |                          |
|       | N      | M       |        | 20 | 15 | 23      | (+15)           |      |                          |
|       |        | F       | 07     | 30 | -  |         |                 |      |                          |
| ✓ 23  | NE     | eL      | 05     | 31 | -  |         |                 |      | Confused by microseisms. |
|       | Z      | eL      |        | 40 | -  |         |                 |      |                          |
|       | N      | M       |        | 47 | 13 | 22      | (+21)           |      |                          |
|       |        | F       | 06     | 08 | -  |         |                 |      |                          |
| 23    | N      | e       | 21     | 52 | -  |         |                 |      |                          |
|       |        | F       | 22     | 00 | -  |         |                 |      |                          |
| 26    | ZE     | e       | 20     | 40 | -  |         |                 |      | No "N" record.           |
|       |        | F       | 21     | 10 | -  |         |                 |      |                          |
| ✓ 28  | ZV,ZE  | iP      | 20     | 58 | 06 |         |                 | 9315 |                          |
|       | ZV,    | i       |        | 58 | 24 |         |                 |      |                          |
|       | N      | eS      | 21     | 08 | 35 |         |                 |      |                          |
|       | N      | ePS     |        | 10 | 03 |         |                 |      |                          |
|       | NE     | e (SSS) |        | 16 | 15 |         |                 |      |                          |
|       | N      | e       |        | 18 | 41 |         |                 |      |                          |
|       | ZNE    | eL      |        | 27 | -  |         |                 |      |                          |
|       | N      | M       |        | 40 | 27 | 18      | (-28)           |      |                          |
|       |        | F       | 22     | 15 | -  |         |                 |      |                          |

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON. 29 DEC 1948

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.
SEISMOLOGICAL BULLETIN FOR NOVEMBER 19 48

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

 CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
OR G. W. WALKER "MODERN SEISMOLOGY" (LONDON, 1913).

| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD<br>T<br>l. | PENDULUM FREE PERIOD<br>T. | DAMPING CONSTANT<br>$\mu^2$ . | $\frac{Ak}{\pi^2}$ |
|------------|----------------------------------|-------------------------------------|----------------------------|-------------------------------|--------------------|
| N.         |                                  | sec.                                | sec.                       |                               | sec-l              |
| E.         |                                  |                                     |                            |                               |                    |
| Z.         |                                  |                                     |                            |                               |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT.    | PHASE.       | G.M.T. |    |     | PERIOD. | AMPLITUDE. | $\Delta$ | REMARKS.              |
|-------|-----------|--------------|--------|----|-----|---------|------------|----------|-----------------------|
|       |           |              | h.     | m. | s.  | sec.    | $\mu$      | km.      |                       |
| 1     | ZNE       | e<br>eL<br>F | 12     | 26 | -   |         |            |          |                       |
|       |           |              |        | 44 | -   |         |            |          |                       |
|       |           |              | 13     | 25 | -   |         |            |          |                       |
| 1/2   | ZNE       | eL<br>F      | 23     | 55 | -   |         |            |          |                       |
|       |           |              | 00     | 25 | -   |         |            |          |                       |
| 3     | ZN        | ePKP         | 05     | 38 | 51  |         |            |          |                       |
|       | NE        | e            | 06     | 01 | 41  |         |            |          |                       |
|       | N         | e            |        | 14 | 13  |         |            |          |                       |
|       | N         | e            |        | 19 | 57  |         |            |          |                       |
|       | ZNE       | eL           |        | 25 | -   |         |            |          |                       |
|       | N         | M            |        | 43 | 14  | 24      | (+30)      |          |                       |
|       |           | F            | 07     | 55 | -   |         |            |          |                       |
| 5     |           |              | 10     | 02 | to) |         |            |          | Standardisation of V. |
|       |           |              | 17     | 14 |     |         |            |          |                       |
| 6     | Z         | e<br>F       | 15     | 20 | -   |         |            |          |                       |
|       |           |              | 16     | 15 | -   |         |            |          |                       |
| 8     | E         | e<br>F       | 06     | 50 | -   |         |            |          | Possibly not seismic. |
|       |           |              | 07     | 00 | -   |         |            |          |                       |
| 10    | E         | e<br>F       | 08     | 00 | -   |         |            |          | Possibly not seismic. |
|       |           |              |        | 10 | -   |         |            |          |                       |
| 13    | ZV,<br>ZE | eP           | 04     | 48 | 50  |         |            |          |                       |
|       |           | e            |        | 53 | 56  |         |            |          |                       |
|       | Z         | e            |        | 54 | 19  |         |            |          |                       |
|       | E         | i            |        | 55 | 57  |         |            |          |                       |
|       | ZE        | eL           |        | 57 | 54  |         |            |          |                       |
|       | E         | M            |        | 59 | 39  | 14      | (-30)      |          |                       |
|       |           | F            | 05     | 30 | -   |         |            |          |                       |

M.O. 502

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

NOVEMBER 19 48

| DATE. | COMPT.                                                                          | PHASE.                                                                    | G.M.T. |    |    | PERIOD. | AMPLI-<br>TUDE. | Δ     | REMARKS.          |
|-------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------|----|----|---------|-----------------|-------|-------------------|
|       |                                                                                 |                                                                           | h.     | m. | s. |         |                 |       |                   |
| 13    | ZV,<br>ZE                                                                       | ePKP<br>eL<br>F                                                           | 07     | 20 | 17 |         | μ               | km.   |                   |
|       |                                                                                 |                                                                           | 08     | 19 | -  |         |                 |       |                   |
|       |                                                                                 |                                                                           | 09     | 30 | -  |         |                 |       |                   |
| 13/14 | NE<br>NE                                                                        | e<br>eL<br>F                                                              | 23     | 48 | -  |         |                 |       |                   |
|       |                                                                                 |                                                                           | 00     | 10 | -  |         |                 |       |                   |
|       |                                                                                 |                                                                           | 01     | 25 | -  |         |                 |       |                   |
| 14    | NE                                                                              | eL<br>F                                                                   | 06     | 57 | -  |         |                 |       |                   |
|       |                                                                                 |                                                                           | 07     | 30 | -  |         |                 |       |                   |
| 19    | ZV,ZE<br>N<br>N<br>ZN                                                           | iP<br>eS<br>e<br>eL<br>F                                                  | 01     | 16 | 18 |         |                 | 8,680 |                   |
|       |                                                                                 |                                                                           |        | 26 | 14 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 26 | 34 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 37 | -  |         |                 |       |                   |
|       |                                                                                 |                                                                           | 02     | 30 | -  |         |                 |       |                   |
| 21    | ZV,Z<br>ZV,Z<br>Z<br>ZN<br>N                                                    | i<br>i<br>e<br>e<br>eL<br>F                                               | 19     | 29 | 40 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 30 | 26 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 40 | 33 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 40 | 51 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 51 | -  |         |                 |       | Poorly developed. |
|       |                                                                                 |                                                                           | 21     | 20 | -  |         |                 |       |                   |
| 22    | ZV,Z<br>ZN                                                                      | e(P)<br>eL<br>F                                                           | 09     | 18 | 56 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 57 | -  |         |                 |       |                   |
|       |                                                                                 |                                                                           | 10     | 40 | -  |         |                 |       |                   |
| 26    | ZV,<br>ZV,<br>ZV,ZE<br>E<br>ZE<br>ZE<br>ZE<br>ZE<br>E<br>E<br>E<br>E<br>ZE<br>E | eP<br>e<br>ePP<br>iS<br>e<br>eSS<br>i<br>i<br>i<br>i<br>e<br>eL<br>M<br>F | 05     | 55 | 35 |         |                 | 7140  | No "N-S" record.  |
|       |                                                                                 |                                                                           |        | 55 | 49 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 57 | 32 |         |                 |       |                   |
|       |                                                                                 |                                                                           | 06     | 04 | 11 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 07 | 20 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 08 | 25 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 09 | 00 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 09 | 46 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 14 | 52 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 20 | 22 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 28 | 22 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 35 | 54 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 37 | -  |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 42 | 00 | 31      |                 |       |                   |
|       |                                                                                 |                                                                           | 09     | 20 | -  |         |                 |       |                   |
| 28    | ZV,<br>ZV,Z<br>NE<br>E<br>ZNE                                                   | i<br>e<br>e<br>e<br>eL<br>F                                               | 21     | 54 | 34 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 54 | 47 |         |                 |       |                   |
|       |                                                                                 |                                                                           | 22     | 01 | 40 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 12 | 40 |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 19 | -  |         |                 |       |                   |
|       |                                                                                 |                                                                           |        | 35 | -  |         |                 |       |                   |

M.O. 502

AIR MINISTRY, METEOROLOGICAL OFFICE, LONDON.

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN FOR DECEMBER 1948

Lat. 51° 28' 6" N, Long. 0° 18' 47" W, Height above M.S.L. 5m.

LITHOLOGIC FOUNDATION: RIVER GRAVEL RESTING ON LONDON CLAY.

INSTRUMENTS: GALITZIN APERIODIC SEISMOGRAPHS, PHOTO-GALVANOMETRIC REGISTRATION, THREE COMPONENTS.

CONSTANTS: FOR NOTATION SEE FÜRST B. GALITZIN "VORLESUNGEN ÜBER SEISMOMETRIE" (LEIPZIG, 1914)  
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| COMPONENT. | DATE FROM WHICH CONSTANTS APPLY. | GALVANOMETER FREE PERIOD<br>T<br>l. | PENDULUM FREE PERIOD<br>T. | DAMPING CONSTANT<br>$\mu^2$ . | $\frac{Ak}{\pi^l}$ |
|------------|----------------------------------|-------------------------------------|----------------------------|-------------------------------|--------------------|
| N.         |                                  | sec.                                | sec.                       |                               | sec-l              |
| E.         |                                  |                                     |                            |                               |                    |
| Z.         |                                  |                                     |                            |                               |                    |

TIME SERVICE: MINUTE TIME-MARKS ARE MADE ELECTROMAGNETICALLY BY CONTACT CLOCK.

TIME COMPARISONS ARE MADE DAILY WITH SIGNALS FROM GREENWICH OBSERVATORY.

SEISMOMETRIC READINGS CAN BE DETERMINED TO THE NEAREST SECOND.

| DATE. | COMPT. | PHASE. | G.M.T. |    |    | PERIOD. | AMPLITUDE. | $\Delta$ | REMARKS.                                         |
|-------|--------|--------|--------|----|----|---------|------------|----------|--------------------------------------------------|
|       |        |        | h.     | m. | s. | sec.    | $\mu$      | km.      |                                                  |
| ✓ 4   | E      | iP     | 00     | 35 | 15 |         |            | 9070     | Only E-W record.<br>Disturbed by<br>microseisms. |
|       | E      | ePP    |        | 38 | 24 |         |            |          |                                                  |
|       | E      | eS     |        | 45 | 32 |         |            |          |                                                  |
|       | E      | ePS    |        | 46 | 21 |         |            |          |                                                  |
|       | E      | eSS    |        | 51 | 05 |         |            |          |                                                  |
|       | E      | e      |        | 54 | 39 |         |            |          |                                                  |
|       | E      | eSSS   |        | 57 | 01 |         |            |          |                                                  |
|       | E      | eL     | 01     | 02 | -  |         |            |          |                                                  |
|       | E      | M      |        | 11 | 20 | 18      | (+45)      |          |                                                  |
|       | E      | F      | 03     | 20 | -  |         |            |          |                                                  |
| 5     | ZNE    | eL     | 00     | 23 | -  |         |            |          | Disturbed by microseisms.                        |
|       |        | F      |        | 55 | -  |         |            |          |                                                  |
| 5     | Z      | e      | 07     | 01 | 56 |         |            |          | Doubtful; confused by<br>microseisms             |
|       | ZNE    | e      |        | 02 | 14 |         |            |          |                                                  |
|       | ZNE    | e      |        | 07 | 22 |         |            |          |                                                  |
|       | E      | e      |        | 11 | 57 |         |            |          |                                                  |
|       | E      | e      |        | 13 | 04 |         |            |          |                                                  |
|       | E      | e      |        | 18 | 44 |         |            |          |                                                  |
|       | NE     | e      |        | 22 | 23 |         |            |          |                                                  |
|       | ZNE    | eL     |        | 33 | -  |         |            |          |                                                  |
|       | N      | M      | 08     | 06 | 54 | 19      | (+15)      |          |                                                  |
|       |        | F      | 09     | 45 | -  |         |            |          |                                                  |
| 6     | E      | e      | 14     | 45 | -  |         |            |          | Possibly not seismic.                            |
|       |        | F      | 15     | 15 | -  |         |            |          |                                                  |
| 7/8   | NE     | e      | 23     | 52 | -  |         |            |          |                                                  |
|       |        | F      | 00     | 20 | -  |         |            |          |                                                  |
| 8     | ZNE    | eL     | 17     | 07 | -  |         |            |          |                                                  |
|       |        | F      |        | 46 | -  |         |            |          |                                                  |

22  
M.O. 502.....

KEW OBSERVATORY, RICHMOND, SURREY, ENGLAND.

SEISMOLOGICAL BULLETIN.

DECEMBER.....19 48

| DATE. | COMPT. | PHASE. | G.M.T. |    |      | PERIOD. | AMPLI-<br>TUDE. | Δ      | REMARKS.                                |
|-------|--------|--------|--------|----|------|---------|-----------------|--------|-----------------------------------------|
|       |        |        | h.     | m. | s.   |         |                 |        |                                         |
| 9     | N      | e(P)   | 13     | 32 | (48) |         |                 | (5315) | Very small;<br>confused by microseisms. |
|       | ZE     | e(S)   |        | 39 | 44   |         |                 |        |                                         |
|       | ZNE    | eL     |        | 54 | -    |         |                 |        |                                         |
|       |        | F      | 15     | 05 | -    |         |                 | (8650) | Doubtful; confused by<br>microseisms.   |
|       | Z      | e(P)   | 13     | 29 | (14) |         |                 |        |                                         |
|       | E      | e(S)   |        | 39 | (10) |         |                 |        |                                         |
| 12    | ZNE    | eL     |        | 56 | -    |         |                 |        |                                         |
|       |        | F      | 14     | 25 | -    |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |
| 14    | ZNE    | eL     | 16     | 55 | -    |         |                 |        |                                         |
|       |        | F      | 17     | 20 | -    |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |
| 15    | ZV,E   | e      | 19     | 29 | (33) |         |                 |        | Very small;<br>confused by microseisms  |
|       | E      | e      |        | 40 | 21   |         |                 |        |                                         |
|       | ZNE    | eL     |        | 56 | -    |         |                 |        |                                         |
|       |        | F      | 20     | 35 | -    |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |
| 16    | ZV,E   | e      | 07     | 38 | 12   |         |                 |        |                                         |
|       | ZNE    | eL     | 08     | 18 | -    |         |                 |        |                                         |
|       |        | F      | 09     | 57 | -    |         |                 |        |                                         |
| 20/21 | NE     | e      | 23     | 25 | -    | 24      | (-12)           |        |                                         |
|       | NE     | eL     |        | 50 | -    |         |                 |        |                                         |
|       | E      | M      |        | 56 | 31   |         |                 |        |                                         |
|       | Z      | eL     | 00     | 01 | -    |         |                 |        |                                         |
|       |        | F      |        | 25 | -    |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |
| 21    | NE     | e      | 20     | 14 | -    |         |                 |        |                                         |
|       | ZNE    | eL     |        | 41 | -    |         |                 |        |                                         |
|       |        | F      | 21     | 25 | -    |         |                 |        |                                         |
| 23    | Z      | 1P     | 08     | 52 | 43   |         |                 | 7980   |                                         |
|       | Z      | e      |        | 53 | 54   |         |                 |        |                                         |
|       | Z      | ePP    |        | 55 | 30   |         |                 |        |                                         |
|       | ZNE    | eS     | 09     | 02 | 04   |         |                 |        |                                         |
|       | NE     | eSS    |        | 06 | 56   |         |                 |        |                                         |
|       | NE     | e(SSS) |        | 11 | 04   |         |                 |        |                                         |
|       | ZNE    | eL     |        | 14 | -    |         |                 |        |                                         |
|       | N      | eL(2)  | 11     | 04 | -    |         |                 |        |                                         |
|       |        | F      | 12     | 00 | -    |         |                 |        |                                         |
| 25    | ZNE    | e      | 15     | 31 | -    |         |                 |        | Small.                                  |
|       |        | F      | 16     | 20 | -    |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |
| 26    | ZNE    | e      | 07     | 41 | -    |         |                 |        |                                         |
|       | ZNE    | eL     |        | 52 | -    |         |                 |        |                                         |
|       |        | F      | 08     | 35 | -    |         |                 |        |                                         |
| 29    | NE     | e      | 07     | 00 | -    |         |                 |        | Confused by<br>microseisms.             |
|       |        | F      |        | 40 | -    |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |
| 31    | E      | e      | 00     | 02 | -    | 17      | -20             |        | Confused by<br>microseisms.             |
|       | ZNE    | eL     |        | 23 | -    |         |                 |        |                                         |
|       | Z      | M      |        | 32 | 17   |         |                 |        |                                         |
|       |        | F      | 01     | 45 | -    |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |
|       |        |        |        |    |      |         |                 |        |                                         |