

No. 13.

1930.

Geodætisk Institut

Proviantgaarden, Copenhagen, Denmark.

Bulletin of the seismological station

KØBENHAVN

$\varphi = 55^{\circ}41' N.$ $\lambda = 12^{\circ}27' E.$ $h = 13$ m.

Lithologic foundation: chalk.

No. 13. Jan.—March 1930.

Instruments:

Galitzin pendulums with galvanometric registration.

Constants:

| Component | l | T_1 | A_1 | μ^2 | T | k |
|-----------|------|-------|-------|---------|------|-----|
| | cm | sec | cm | | sec | |
| N | 12.5 | 12.63 | 100 | 0.15 | 12.6 | 105 |
| Z | 14.4 | 11.55 | 100 | 0.2 | 8 | 95 |

Wiechert 1000 kg. horizontal seismograph.

Wiechert 1300 kg. vertical seismograph.

Constants:

| Component | T | ν | ρ | V |
|-----------|-----|-------|--------|-----|
| | sec | | mm | |
| N | 9.6 | 4.3 | 0.8 | 225 |
| E | 9.6 | 4.4 | 0.4 | 195 |
| Z | 5.6 | 4.2 | 0.2 | 165 |

Milne-Shaw seismographs, N and E components, with the approximate constants $T = 12^s$ $\nu = 20$ $V = 300$.

Wood-Anderson torsion seismometers, N component, $T = c. 11^s$; E component, $T = c. 4^s$; working intermittingly.

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| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|-----|--------------|------|-------------|--------|-------|-------|-----|------------|----|--|
| | | | P | S | | | | | | |
| | | | m s | m s | h m s | m s | h m | h m | ° | |
| 1* | 1930 Jan. 5* | 1 | 30 49 | 39 49 | | | .9 | | 67 | Sea of Okhotsk. |
| 2 | 5 | 19 | 3 50 | 13.3 | | | .5 | | 72 | Kurile Islands. |
| 3 | 7 | 1 | | | | | .3 | | | |
| 4 | 7 | 17 | | | | | .9 | | | |
| 5 | 10 | 18 | | | | | .9 | | | |
| 6 | 14 | 22 | | | 24.1 | | 1.1 | | | |
| 7 | 16 | 0 | | | 7.3 | | .2 | | | |
| 8 | 17 | 17 | | | | | .7 | | | |
| 9 | 18 | 7 | | | 23.5 | | .9 | | | |
| 10 | 23 | 3 | | | | | | .6 | | |
| 11 | 23 | 11 | | | | | .4 | 7 | | |
| 12 | 25 | 2 | | | | | .3 | | | |
| 13 | 28 | 7 | | | | | | | | |
| 14 | Febr. 1 | 19 | | | | | .7 | | | |
| 15* | 2* | 15 | 7 26 | 16 46* | 11.9 | 21.7 | .5 | | 71 | Aleutian Islands. |
| 16 | 5 | 1 | | | | | .1 | | | |
| 17 | 7 | 7 | | | | | .5 | | | Faint forerunners. |
| 18 | 7 | 9 | | | | | .4 | | | |
| 19 | 7 | 13 | | | | | .5 | | | Faint. |
| 20 | 7 | 16 | | | 58 20 | | 1.3 | | | |
| 21 | 8 | 0 | | | | | | | 53 | Faint. |
| 22 | 8 | 4 | | | | | | .0 | | " |
| 23 | 8 | 5 | | 30 8 | | | 36 | | | Kurdistan. |
| 24 | 8 | 6 | | 43 35 | | | 51 | | | Afghanistan. |
| 25 | 12 | 6 | | | | | 1.7 | | | Faint forerunners disturbed by microseisms. |
| 26* | 14* | 18 | 42 50 | | | | | | | Aegean Sea. |
| 27 | 14 | 21 | | | 0 47 | | 1.1 | | | |
| 28 | 15 | 19 | | | | | .4 | | | |
| 29 | 18 | 2 | | | 14.5 | 24.5 | .8 | | | |
| 30 | 18 | 7 | | | | | .3 | | | |
| 31* | 23* | 18 | 23 18 | 26 50 | | | | 28 | 19 | Aegean Sea. |
| 32 | 24 | 21 | | | 9 | 14 36 | .7 | | | |
| 33 | 26 | 3 | | | | | .2 | | | |
| 34 | 27 | 3 | | | | | .6 | | | |
| 35 | 28 | 1 | | 16 20 | | | .4 | | | Atlantic Ocean. |
| 36 | March 1 | 6 | | | | | .0 | | | |
| 37 | 6 | 0 | | | 0.0 | | | | | Not very distant. |
| 38 | 6 | 3 | | 53 3 | | | | | | L faint. |
| 39 | 6 | 8 | | | | | | 32 | | |
| 40* | 6* | 9 | | 27 21 | 23 45 | 27 51 | 31 | | | Archipelago. |
| 41 | 6 | 15 | | | 55.1 | 70.5 | 1.8 | | | |
| 42 | 7 | 6 | | | | | .9 | | | |
| 43 | 7 | 11 | | | | | .6 | | | |
| 44 | 8 | 3 | | | 58.2 | 68 10 | 1.4 | | | |
| 45 | 9 | 10 | | | | | .4 | | | |

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| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|-----|---------------|------|-------------|-------|-------|-------|-----|------------|----|--------------------------------|
| | | | P | S | | | | | | |
| | | | m s | m s | h m s | m s | h m | h m | ° | |
| 46 | 1930 March 10 | 14 | | | | | .5 | | | |
| 47* | 10* | 16 | 37 31 | 45 41 | 39 39 | 46 28 | | | 60 | Sea of Okhotsk. |
| 48 | 15 | 4 | | | | | .8 | | | |
| 49 | 15 | 7 | | | | | .9 | | | |
| 50 | 15 | 9 | | | 22.7 | | | 27 | | |
| 51 | 16 | 5 | | | | | .8 | | | |
| 52 | 20 | 14 | | | | | .0 | | | |
| 53 | 22 | 9 | | | | | .5 | | | |
| 54 | 23 | 20 | | | | | .0 | | | |
| 55* | 26* | 7 | 26 37 | | | | 1.0 | | | Timor. |
| 56 | 26 | 11 | | | | | | 45 | | Superposed on following shock. |
| 57 | 26 | 12 | | | | | .5 | | | |
| 58 | 30 | 1 | | | | | .2 | | | |
| 59 | 30 | 8 | | | .9 | | 1.2 | | | Disturbed. |
| 60 | 30 | 15 | | | 38.5 | 47.8 | 1.3 | | | |
| 61* | 31* | 12 | 37 56 | 41.3 | | | | 44 | | Aegean Sea. |

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NOTES

- No. 1. Jan. 5. 1^h. Sea of Okhotsk. Phases not clearly marked; disturbed by microseisms. *L* irregular.
- No. 15. Febr. 2. 15^h. Aleutian Islands. *PP* 10^m12^s; *PPP* 11^m.9, stronger. *S* followed by much movement, but other phases not clearly marked. *M* regular.
- No. 26. Febr. 14. 18^h. Aegean Sea; $\Delta = c. 20^\circ$. Destructive in Crete. Strong microseismic movement. Light too faint on *GN*; *WN* indistinct owing to bad smoking. The beginning of *P* small; on *Z* increase of movement 43^m10^s; large oscillations i_z 43^m23^s; 43^m53^s. On *E* some increase of movement 46^m22^s (*S* or microseisms?); 46^m42^s (*S*); 46^m50^s* very large oscillations on all; on *E*, *i* 47^m22^s, large. *L* irregular, smaller than *S*, the beginning uncertain. Deep focus?
- No. 31. Febr. 23. 18^h. Aegean Sea. This earthquake seems to belong to the same epicentral region as no. 26, but the difference in the seismograms is striking. In this case *P*, *S* and *L* are distinct and clearly separated phases. There are no further phases; *L* is much larger than the forerunners.
- No. 40. March 6. 9^h. Archipelago. Possibly some disturbance due to work at the station. *P* faint; 22^m53^s* on *WZ* not quite certain. 23^m12^s certain on *WZ*, but on *GZ* first discernible movement 23^m17^s. *S* more clearly marked; *L* faint.
- No. 47. March 10. 16^h. *P* very faint, visible on *WZ* only. *PP* clearly marked on *GN* and *Z*. *S* a large oscillation, followed on *N* by clearly marked phase. *L* irregular, the beginning uncertain.
- No. 55. March 26. 7^h. Timor. $\Delta = c. 110^\circ$. Phases clearly marked. *P* 30^m.3; *PP* 31^m17^s; *e* 32^m8^s; *PPP* 33^m24^s; *e* 35^m.5; *S_cP_cS_E* 37^m.4; *S_cP_cP_cS_E* 38^m.2; *S* 38^m56^s; *PS* 40^m.5; *SS* c. 46^m.5; *SSS* c. 50^m.4. *L* earliest on *N*; of long duration.
- No. 61. March 31. 12^h. Aegean Sea; $\Delta = c. 20^\circ$. Recorded on Wiechert and Wood-Anderson instruments only. *S* a distinct phase, but the beginning uncertain. *M* irregular.

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of the seismological station

KØBENHAVN

$\varphi = 55^\circ 41' N$. $\lambda = 12^\circ 27' E$. $h = 13$ m.

Lithologic foundation: chalk.

No. 14. April—June 1930.

Instruments:

Galitzin pendulums with galvanometric registration.

Constants:

| Component | <i>l</i> | <i>T</i> ₁ | <i>A</i> ₁ | | μ^2 | <i>T</i> | <i>k</i> |
|-----------|------------|-----------------------|-----------------------|--|-------------|-------------|-----------|
| <i>N</i> | cm 12.5 | sec 12.63 | cm 100 | | 0.15 | sec 12.6 | 104 |
| <i>E</i> | 12.5 | 12.69 | 100 | $\frac{3}{4} - \frac{17}{6}$ | 0.1 | 12 | 100 |
| <i>Z</i> | 14.4 | 11.55 | 100 | $\frac{24}{5} - \frac{30}{6}$ $\frac{1}{4} - \frac{9}{4}$ | 0.05 0.2 | 12.5 8 | 100 95 |

E was remounted on April 9th.

Z was dismantled on April 9th and remounted on June 19th; in June the constants were undetermined.

Wiechert 1000 kg. horizontal seismograph.

Wiechert 1300 kg. vertical seismograph.

Constants:

| Component | <i>T</i> | ν | ρ | <i>V</i> |
|-----------|------------|-------|-----------|----------|
| <i>N</i> | sec 9.7 | 4.4 | mm 0.8 | 223 |
| <i>E</i> | 9.5 | 4.5 | 0.5 | 195 |
| <i>Z</i> | 5.6 | 4.3 | 0.2 | 160 |

Milne-Shaw seismograph, *E* component, with the approximate constants $T = 12^s$ $\nu = 20$ $V = 300$.

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| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|-----|------------|------|-------------|-------|-------|--------|-----|------------|--------------------------------|---------|
| | | | P | S | | | | | | |
| | | | m s | m s | h m s | m s | h m | h m | ° | |
| 1 | 1930 April | 5 | | | | | .2 | | | |
| 2 | 2 | 20 | | | | | .8 | | | |
| 3 | 4 | 9 | | | 46 | | 1.4 | | | |
| 4 | 5 | 11 | 35.8 | 45 | | | 1.0 | | | |
| 5 | 9 | 5 | 33 5 | 37 16 | | | 43 | 24 | | |
| 6 | 10 | 14 | | | 39.1 | | 45 | | | |
| 7 | 15 | 10 | | | 9 22 | | .3 | | | |
| 8 | 15 | 10 | | | 56.0 | | 1.5 | | | |
| 9 | 16 | 4 | | | | | .7 | | | |
| 10 | 16 | 13 | 50 18 | 54 46 | | | 57 | 26 | Overlapped by following shock. | |
| 11 | 16 | 14 | | | | | 8 | | | |
| 12 | 16 | 14 | | | 51.3 | | 1.1 | | | |
| 13 | 17 | 2 | | | | | .4 | | | |
| 14* | 17* | 20 | 11 4 | 14 41 | | | | 20 | Greece. | |
| 15 | 18 | 13 | | | | | .3 | | | |
| 16 | 20 | 10 | | | 30.3 | | .6 | | | |
| 17 | 20 | 16 | | | 44.9 | | 1.5 | | | |
| 18 | 21 | 10 | | | 41.1 | | .9 | | | |
| 19* | 21* | 12 | | | 11.1 | 16 23 | .7 | | Atlantic Ocean. | |
| 20 | 21 | 19 | | | | | 31 | | | |
| 21 | 21 | 22 | | | | | .6 | | | |
| 22 | 22 | 14 | | | | | .9 | | Faint. | |
| 23 | 23 | 18 | | 47 42 | | | 1.0 | | | |
| 24* | 23* | 22 | 0 26 | 9 57 | 14.8 | 18 | .4 | 72 | | |
| 25 | 24 | 0 | | | 35 8 | | 1.0 | | Forerunner on Z. | |
| 26 | 25 | 11 | | | | | .8 | | | |
| 27 | 25 | 15 | | | | | .7 | | Faint preceding movement. | |
| 28 | 26 | 7 | | | | | .1 | | | |
| 29 | 26 | 11 | | | | | .6 | | Faint. | |
| 30 | 26 | 16 | | | | | .1 | | " | |
| 31* | 26* | 16 | 29 42 | 39 5 | 43.9 | | | 71 | Aleutian Islands. | |
| 32 | 27 | 10 | | | | | .8 | | | |
| 33 | 27 | 14 | | | 43.2 | 50.6 | 1.2 | | | |
| 34 | 27 | 16 | | | | | .7 | | | |
| 35 | 27 | 21 | | | 56 | 65.9 | 1.5 | | | |
| 36 | 28 | 13 | | | 27 | | .5 | | Overlapped by following shock. | |
| 37 | 28 | 14 | | | | | .1 | | | |
| 38* | 28* | 18 | 45 30 | 54 23 | 49 37 | 58 43* | | 66 | China. | |
| 39 | 29 | 9 | | | | | .1 | | | |
| 40 | 30 | 16 | | | 25 19 | | 1.1 | | | |
| 41 | May | 1 | 9 56 | 19 48 | 12 56 | | .6 | 76 | Japan. | |
| 42 | 1 | 5 | | | | | .0 | | | |
| 43 | 1 | 10 | | | .5 | | .8 | | | |
| 44 | 2 | 2 | | | 4 | | .7 | | | |
| 45 | 2 | 6 | | | 21 4 | 24 36 | 1.0 | | | |
| 46 | 3 | 16 | | | | | .6 | | | |
| 47* | 5* | 13 | 57 22 | 66 39 | | | | 70 | Burma. Armenia. | |
| 48 | 6 | 7 | | | 10 | | 18 | | | |

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| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|-----|----------|------|-------------|-------|-------|-------|-----|------------|------------------------------|---------|
| | | | P | S | | | | | | |
| | | | m s | m s | h m s | m s | h m | h m | ° | |
| 49* | 1930 May | 6* | 22 | 40 14 | 45 0 | | | | 29 | Persia. |
| 50 | 7 | 6 | | | | | .0 | | | |
| 51* | 7* | 9 | | | | | .7 | | | |
| 52 | 7 | 13 | | | | | 63 | | Some preceding movement. | |
| 53 | 7 | 14 | | | 37 1 | | | | | |
| 54 | 8 | 5 | | | 40 5 | | 45 | | Persia. | |
| 55 | 8 | 13 | | | 6 | 11.9 | .7 | | Overlapped by next shock. | |
| 56 | 8 | 13 | | | 59 | | 1.6 | | " " " " | |
| 57 | 8 | 15 | | | | | | 17 | " " " " | |
| 58* | 8* | 15 | 41 16 | 46 0 | 41 59 | 47.5 | | 29 | Armenia. | |
| 59 | 8 | 23 | | | | | .5 | | | |
| 60 | 8 | 23 | | | 43 | | 52 | | | |
| 61 | 9 | 2 | | | | | .0 | | | |
| 62 | 9 | 7 | 12 43* | 17 6 | 18.1 | | 23 | 26 | Mediterranean Sea. | |
| 63 | 9 | 8 | | | | | | .2 | | |
| 64 | 9 | 14 | | | | | .8 | | | |
| 65 | 9 | 21 | | | | | 23 | | | |
| 66 | 10 | 0 | | | | | .8 | | | |
| 67 | 10 | 21 | | | 54.1 | | 59 | | | |
| 68 | 10 | 22 | | | 34 | | .9 | | | |
| 69 | 11 | 0 | | | | | 15 | | | |
| 70 | 11 | 11 | | | | | .9 | | Faint preceding movement. | |
| 71* | 11* | 22 | 43 34 | 49 52 | 45.3 | 50 11 | | 42 | Persia. | |
| 72 | 12 | 0 | 28 59 | 35.1 | | | .7 | 41 | " | |
| 73 | 12 | 13 | | | | | .2 | | | |
| 74 | 12 | 22 | | | | | .9 | | | |
| 75 | 13 | 1 | | | | | .2 | | Faint. | |
| 76 | 13 | 8 | | | 39.4 | | 1.0 | | Disturbed. | |
| 77 | 13 | 18 | | | | | .7 | | | |
| 78 | 13 | 20 | | | | | .7 | | | |
| 79 | 14 | 0 | | | | | | 6 | Italy. | |
| 80 | 14 | 12 | | | | | .6 | | Faint. | |
| 81 | 14 | 19 | | | 52 59 | | 1.1 | | | |
| 82 | 16 | 2 | | | | | .9 | | Overlapped by next shock. | |
| 83 | 16 | 3 | | | | | .3 | | | |
| 84 | 16 | 20 | | | | | .9 | | | |
| 85 | 18 | 0 | | | .6 | | 1.0 | | | |
| 86 | 19 | 3 | | | .6 | | 1.1 | | | |
| 87 | 19 | 15 | 16 7 | 26 12 | 26 57 | | .8 | 79 | | |
| 88 | 20 | 8 | | | 10 | | .6 | | | |
| 89 | 20 | 11 | 26 25 | 35 38 | 40.6 | | .8 | 69 | Aleutian Islands. Disturbed. | |
| 90 | 21 | 12 | | | | | .5 | | | |
| 91 | 21 | 14 | | | | | | .1 | | |
| 92 | 21 | 21 | | | | | .2 | | | |
| 93 | 21 | 22 | 15 20 | 20.4 | | | 24 | 31 | Atlantic Ocean. | |
| 94 | 23 | 0 | | | | | .7 | | | |
| 95 | 23 | 9 | | | 55 | | 64 | | | |
| 96* | 23* | 16 | 50 4 | 59 55 | 60 7 | 65 | .3 | 76 | Japan. | |
| 97 | 24 | 22 | | | | | | 8 | | |
| 98 | 26 | 16 | | | | | .5 | | | |

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| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|------|----------|------|-------------|-------|---------|-------|-----|------------|---------------------------|---------|
| | | | P | S | | | | | | |
| | | | m s | m s | h m s | m s | h m | h m | ° | |
| | 1930 May | | | | 59 | | 1.2 | | | |
| 99 | 26 | 22 | | | | | .2 | | | |
| 100 | 27 | 13 | | | | | | .1 | Faint. | |
| 101 | 27 | 17 | | | | | | .2 | " | |
| 102 | 29 | 3 | | | | | | 25 | Armenia. | |
| 103 | 29 | 17 | | | .7 | | 1.0 | | | |
| 104 | 31 | 10 | | | 25.0 | | .6 | 76 | Japan. | |
| 105 | 31 | 18 | 10 18 | 20 6 | | | | | | |
| | June | | | | | | | | | |
| 106 | 1 | 3 | | | | | .5 | | | |
| 107 | 1 | 13 | | | 28.9 | 37.8 | 1.3 | | Faint preceding movement. | |
| 108 | 1 | 21 | | | | | .9 | | | |
| 109 | 3 | 18 | | | 19.4 | | .6 | | | |
| 110 | 4 | 7 | 33 58 | 38 40 | | | | 28 | Persia. | |
| 111 | 4 | 10 | | | 8.8 | 14 17 | .8 | | Disturbed. | |
| 112 | 5 | 12 | | | 6.0 | | .7 | | | |
| 113 | 5 | 17 | | | | | .1 | | | |
| 114 | 5 | 22 | 3 24 | 7.6 | | | | 11 | Mediterranean Sea. | |
| 115 | 9 | 4 | | | | | 47 | | | |
| 116* | 11* | 1 | | | 10 3 | 19 39 | | | Salomon Islands. | |
| 117 | 11 | 11 | | | | | .3 | | | |
| 118 | 11 | 14 | | | | | .5 | | | |
| 119 | 13 | 1 | 5 27 | 15.0 | | | .5 | 73 | | |
| 120 | 15 | 8 | | | | | .9 | | Disturbed. | |
| 121 | 15 | 21 | | | 27.7 | 50.5 | 1.2 | | | |
| 122 | 17 | 20 | | | | | | 34 | | |
| 123 | 18 | 16 | | | | | .5 | | | |
| 124 | 19 | 13 | | | 31.5 | | 1.0 | | 2 shocks acc. to URSS. | |
| 125 | 21 | 22 | | | | | .0 | | | |
| 126 | 22 | 18 | | | 57.3 | 62.6 | 1.3 | | | |
| 127 | 23 | 19 | | | 54.5 | 64.6 | 1.5 | | | |
| 128 | 25 | 1 | | | | | .3 | | | |
| 129* | 25* | 10 | 31 35 | 43 16 | 42 14 | 44.8 | 1.0 | | Peru. | |
| 130 | 25 | 12 | 17 1 | 25 50 | 26 53 | | .6 | 66 | | |
| 131 | 25 | 13 | | | | | .7 | | | |
| 132* | 25* | 21 | | | i 27 32 | | | | | |
| 133* | 25* | 21 | 35 31 | 47 15 | 46 15 | 48.7 | 1.1 | | Peru. | |
| 134 | 26 | 4 | | | | | .7 | | Faint. | |
| 135 | 28 | 19 | | | | | .9 | | | |
| 136 | 30 | 0 | | | | | .5 | | | |

København.

NOTES

- No. 14. April 17. 20^h. Greece. First movement faint; increase 11^m6^s and 11^m8^s S large and clearly marked; L shortly after S 21^m large M.
- No. 19. April 21. 12^h. Atlantic Ocean. $\Delta = c. 110$. PP 11^m1, faint, on GN only. $S_c P_c S$ 16^m23^s; e 17^m7; PS 20^m4; SS 26^m8; SSS 31^m1. L earliest on E; regular.
- No. 24. April 23. 22^h. First movement faint, on Z only; P_N 0^m28^s. On E, the first part of L is a group of long-period, regular waves of relatively large amplitude.
- No. 31. April 26. 16^h. P and S clearly marked. P reflections faint. S followed by much movement, 40^m5^s clearest marked impulse. The first part of L irregular; after 17^h regular M waves.
- No. 38. April 28. 18^h. China. Not strong record, but all phases, including L, have very clearly marked beginnings. L irregular begins 67^m7 on N, on E 71^m6; M group on N about 71^m5.
- No. 47. May 5. 13^h. Burma. Very strong record. Condensation. P reflections not clearly marked: PP_E 60^m0; PPP_E 61^m9. S begins earliest on N; S_E 66^m49^s. After S large oscillations; best defined impulses: 67^m29^s, sharpest on E; e_E 68^m2; e_N 68^m6; e_Z 69^m2; e_N 70^m7; e_E 72^m7; e_N 73^m2. Large irregular oscillations continue into L. On N a group of very large M waves begin 87^m; on E and Z, M waves begin 91^m; several groups of large waves.
- No. 49. May 6. 22^h. Persia. Very strong record. P begins faintly, dilatation, increases i 40^m20^s; 40^m41^s; i 41^m1^s, followed by large oscillations. e_E 42^m2. S largest on E; i_{N, Z} 45^m23^s, followed by very large movement. i_E 46^m6; i_N (L) 47^m6. On N, very large M group begins 50^m0; M_E some minutes later.
- No. 51. May 7. 9^h. Some long-period disturbance which continues until about 21^h makes the reading of this and the following records uncertain.
- No. 58. May 8. 15^h. Armenia. S largest on E; followed by movement of long period. The beginning of L not certain; M earliest on N.
- No. 71. May 11. 22^h. Persia. Small, but phases clearly marked. e_E 53^m6; e_N (L) 54^m7; e_E (L) 55^m5.
- No. 96. May 23. 16^h. Japan. P just visible, on Z only. S and the next phase clearly marked, each by a large oscillation. The following movement small.
- No. 116. June 11. 1^h. Salomon Islands; $\Delta = c. 120^\circ$. PP 10^m3^s, clearly marked; PPP 12^m5; PS 19^m39^s; e 19^m45^s; e 21^m18^s; SS 27^m9^s. About 2 min. after SS series of regular waves begin, of the appearance of L waves. L begins about 1^h7 with less regular waves of longer period; M about 2^h0.
- No. 129. June 25. 10^h. Peru; $\Delta = c. 100^\circ$. Record not strong, but phases clearly marked. The beginning of P not quite certain owing to disturbance of the Z record. PP 35^m6. $S_c P_c S$ on E only, 42^m14^s; S_N, best marked on N, 43^m16^s. PS_E 44^m8 i_Z 45^m33^s; SS 50^m4. L earliest on N; regular, of long duration.
- No. 132. June 25. 21^h27^m32^s, large oscillation on Z followed by very small movement, lasting a few minutes only.
- No. 133. June 25. 21^h. Peru; $\Delta = c. 100^\circ$. Stronger than no. 129; same phases recorded. PP 39^m6; $S_c P_c S_E$ 46^m15^s; S_N 47^m15^s; PS_E 48^m7, e_Z 49^m35^s; SS 54^m3. L earliest on N; regular, of long duration.

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Bulletin
of the seismological station

KØBENHAVN

$\varphi = 55^{\circ}41' N.$ $\lambda = 12^{\circ}27' E.$ $h = 13$ m.

Lithologic foundation: chalk.

No. 15. July—Sept. 1930.

Instruments:

Galitzin pendulums with galvanometric registration.

Constants:

| Component | l | T_1 | A_1 | | μ^2 | T | k |
|-----------|------|-------|-------|--------------------|---------|------|-----|
| | cm | sec | cm | | | sec | |
| N | 12.5 | 12.63 | 100 | | 0.15 | 12.6 | 105 |
| E | 12.5 | 12.69 | 100 | | 0.1 | 12.6 | 100 |
| Z | 14.4 | 11.55 | 100 | from $\frac{3}{9}$ | -0.1 | 10 | 95 |

Z was recording regularly, but the temperature compensation was adjusted and therefore the constants were undetermined until Sept. 5th.

Wiechert 1000 kg. horizontal seismograph.

Wiechert 1300 kg. vertical seismograph.

Constants:

| Component | T | ν | ρ | V |
|-----------|-----|-------|--------|-----|
| | sec | | mm | |
| N | 9.7 | 4.6 | 0.7 | 223 |
| E | 9.6 | 4.6 | 0.6 | 194 |
| Z | 5.7 | 4.2 | 0.2 | 160 |

Milne-Shaw seismographs, N and E components, with the approximate constants $T = 12^s$ $\nu = 20$ $V = 300$

Wood-Anderson torsion seismometers, ($\sqrt{1-\nu^2/s}$), N component, $T = c. 11^s$; E component, $T = c. 4^s$.

København.

| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|-----|-----------|------|-------------|-------|-------|-------|-----|------------|----|----------------------------|
| | | | P | S | | | | | | |
| | 1930 July | | m s | m s | h m s | m s | h m | h m | ° | |
| 1 | 1 | 1 | 20 17 | 29.5 | 22.9 | 33.7 | .7 | | 73 | |
| 2 | 1 | 20 | | | | | | .2 | | Seismic? |
| 3* | 2* | 21 | 14 4 | 22.4 | 16 38 | 26.3 | | | 61 | Tibet. |
| 4 | 3 | 0 | 29 32 | 37 45 | | | 52 | | | " P uncertain. |
| 5 | 4 | 5 | | | | | .3 | | | |
| 6 | 4 | 21 | | | | | | .2 | | |
| 7 | 4 | 22 | | | | | .2 | | | Faint. |
| 8 | 5 | 18 | | | 16 55 | | .9 | | | |
| 9 | 5 | 23 | | | 20.6 | | 24 | | | Faint preceding movement. |
| 10 | 7 | 13 | | | 56.3 | | 1.2 | | | |
| 11 | 7 | 20 | | | | | .6 | | | |
| 12 | 8 | 10 | | | | | .3 | | | |
| 13 | 8 | 17 | | | | | .6 | | | |
| 14 | 9 | 4 | | | | | | .8 | | |
| 15 | 10 | 13 | | | | | .1 | | | Faint. |
| 16 | 10 | 20 | | | | | | 15 | | |
| 17 | 11 | 7 | | | 25 46 | 30.1 | | | | |
| 18 | 13 | 1 | | | 34 50 | | 1.2 | | | |
| 19 | 13 | 14 | | | | | .1 | | | |
| 20 | 13 | 14 | | | 19.2 | | .6 | | | |
| 21* | 13* | 19 | 37 8 | 45 8 | 40.3 | 48.9 | .9 | | 58 | China. |
| 22 | 14 | 20 | | | 55.6 | | 1.1 | | | |
| 23* | 14* | 22 | 53 14* | | 63 44 | 68.0 | | | | Central America. |
| 24 | 16 | 3 | | | | | .7 | | | |
| 25 | 17 | 14 | 46 41 | 56 39 | | | .3 | | 77 | Disturbed. |
| 26 | 17 | 18 | | | | | .9 | | | Faint. |
| 27 | 19 | 15 | | | | | | .7 | | " |
| 28 | 19 | 23 | | | 49.9 | | 1.0 | | | |
| 29 | 20 | 11 | | | | | .2 | | | |
| 30 | 20 | 15 | | | | | .4 | | | |
| 31 | 21 | 14 | | | 28 33 | | | | | |
| 32 | 22 | 12 | | | | | .0 | | | |
| 33* | 22* | 19 | 37 10 | 46 25 | 42.1 | | 1.0 | | 70 | Kurile Islands. |
| 34* | 23* | 0 | 12 6 | 15 3 | | | | | 15 | Italy. |
| 35 | 23 | 5 | | | | | | 38 | | " |
| 36 | 23 | 14 | | | | | 1 | | | " |
| 37 | 23 | 18 | | | | | | 10 | | Faint. |
| 38 | 23 | 19 | | | | | .4 | | | |
| 39 | 24 | 8 | | | | | | .5 | | Faint. |
| 40 | 24 | 12 | | | | | | 12 | | |
| 41 | 24 | 15 | | | | | .2 | | | Faint. |
| 42 | 24 | 21 | | | | | .0 | | | |
| 43 | 25 | 19 | 52.0 | 56.5 | | | 61 | | | |
| 44 | 25 | 22 | | | | | .2 | | | |
| 45 | 27 | 15 | | | 24.4 | | .8 | | | |
| 46 | 27 | 19 | 11 24 | | 14.7 | 21 57 | .7 | | | |
| 47 | 28 | 17 | | | | | | .2 | | Faint. |
| 48 | 28 | 18 | | | .4 | 28.5 | | | | |
| 49 | 29 | 6 | 36.9 | | 39.9 | 46.8 | 1.0 | | | P faint, time not certain. |
| 50 | 31 | 0 | | | | | | 29 | | |

København.

| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|-----|-----------|------|-------------|-------|--------|------|-----|------------|----|--------------------------------|
| | | | P | S | | | | | | |
| | 1930 July | | m s | m s | h m s | m s | h m | h m | ° | |
| 51 | 31 | 5 | | | | | | 32 | | |
| | Aug. | | | | | | | | | |
| 52 | 1 | 0 | | | | | .9 | | | |
| 53 | 2 | 3 | | | 17 8 | | | | | |
| 54* | 2* | 16 | | | 26.2 | | 1.3 | | | Faint. |
| 55 | 2 | 23 | | | | | .4 | | | |
| 56 | 3 | 2 | | | | | .5 | | | |
| 57 | 3 | 22 | | | 11 41 | | .5 | | | " |
| 58* | 4* | 5 | 16 47 | | | | | | | |
| 59 | 4 | 12 | | | | | .5 | | | |
| 60 | 4 | 16 | | | | | .7 | | | |
| 61 | 5 | 0 | | | 31.1 | 32.9 | .9 | | | |
| 62 | 5 | 23 | | | 32 15 | | 36 | | | Aegean Sea. |
| 63 | 6 | 8 | | | | | .1 | | | |
| 64 | 8 | 0 | | | | | .5 | | | |
| 65 | 9 | 18 | | | 14 47* | 19.2 | 23 | | | |
| 66 | 9 | 20 | | | | | .6 | | | |
| 67 | 9 | 22 | | | | | .1 | | | |
| 68 | 9 | 22 | | | 58.3 | | 64 | | | |
| 69 | 10 | 1 | | | | | .1 | | | |
| 70 | 13 | 5 | | | | | .9 | | | |
| 71 | 13 | 6 | | | | | .8 | | | |
| 72 | 13 | 21 | | | 46.9 | | 1.1 | | | |
| 73 | 17 | 9 | | | 50 28 | | 1.2 | | | |
| 74 | 17 | 12 | 37 12 | 43 28 | 39 1 | 46.8 | | | 42 | Persia. |
| 75* | 18* | 10 | 8 40* | | 13 22 | 19 8 | 41 | | | Atlantic Ocean. |
| 76 | 19 | 5 | | | | | .9 | | | |
| 77 | 19 | 18 | | | | | .4 | | | |
| 78* | 20* | 21 | 6.3 | 16 21 | | | 31 | | 78 | Formosa. |
| 79 | 21 | 7 | | | 7.0 | | 11 | | | |
| 80 | 21 | 11 | | | | | .4 | | | |
| 81 | 21 | 15 | | | | | .8 | | | Faint. |
| 82 | 22 | 0 | | | 53 58 | | 59 | | | |
| 83 | 22 | 10 | | | | | | 8 | | |
| 84* | 23* | 11 | 1 2 | 7 16 | 2 47 | 10.6 | | | 42 | Persia. |
| 85 | 23 | 15 | | | | | .5 | | | Faint. |
| 86 | 24 | 10 | | | | | .2 | | | Forerunners disturbed. |
| 87 | 24 | 11 | | | | | .4 | | | Superposed on preceding shock. |
| 88 | 27 | 15 | | | .2 | | .9 | | | |
| 89 | 29 | 7 | | | | | .8 | | | |
| 90 | 29 | 9 | | | | | .1 | | | Preceding movement disturbed. |
| 91 | 29 | 20 | | | 23 | | .6 | | | |
| 92 | 31 | 4 | | | | | .3 | | | Faint. |
| | Sept. | | | | | | | | | |
| 93 | 1 | 5 | | | 37.8 | | .9 | | | |
| 94 | 1 | 17 | 52 10 | 59 22 | 54.1 | 63 | | 69 | 51 | Himalaya. |
| 95 | 2 | 16 | | | | | .6 | | | |
| 96 | 2 | 19 | 6 7 | 11 54 | | | 20 | | 38 | Persia. |

København.

| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks | | | | |
|------|-------|------|-------------|----|----|------|------|------------|------|---------|-----|----|----|-----------------------|
| | | | P | | S | | | | | | | | | |
| | | | m | s | h | m | s | m | s | h | m | h | m | ° |
| | 1930 | | | | | | | | | | | | | |
| | Sept. | | | | | | | | | | | | | |
| 97 | 5 | 16 | | | | | 34.9 | | | | 42 | | | Persia. |
| 98 | 7 | 11 | | | | | | | | | 8 | | | |
| 99 | 9 | 11 | | | | | | | | | .5 | | | Faint. |
| 100 | 10 | 15 | | | | | | | | | | .1 | | |
| 101 | 10 | 23 | | | | | | | | | .2 | | | " |
| 102 | 11 | 3 | | | | | | | | | .6 | | | " |
| 103 | 11 | 4 | | | | | | | | | .5 | | | |
| 104* | 11* | 12 | 41 | 41 | 45 | 49 | 41 | 48 | | | 49 | | 24 | Asia Minor. |
| 105 | 11 | 17 | | | | | 30.0 | 37.7 | | | | | | Hindu Kush. |
| 106 | 12 | 8 | 22.9 | | | | | | | | 30 | | | Archipelago. |
| 107 | 12 | 9 | | | | 30.6 | | | | | 33 | | | " |
| 108 | 12 | 13 | | | | | | | | | | 42 | | |
| 109 | 13 | 18 | | | | | | | | | .6 | | | |
| 110 | 13 | 20 | 10 | 13 | 13 | 49 | | | | | 16 | | 20 | Mediterranean Sea. |
| 111 | 13 | 23 | | | | | 37 | | | | 1.4 | | | |
| 112 | 14 | 3 | | | | | 21.1 | | | | 1.3 | | | |
| 113 | 14 | 17 | | | | | 32 | 11 | 35 | 30 | 1.3 | | | |
| 114 | 16 | 0 | | | | | | | | | | .2 | | |
| 115 | 17 | 3 | | | | | | | | | .9 | | | |
| 116 | 17 | 17 | | | | | 17.2 | | | | .4 | | | |
| 117 | 20 | 13 | | | | | | | | | .5 | | | |
| 118* | 21* | 23 | 15 | 7 | 23 | 58 | 19 | 13* | 28.3 | | .6 | | 66 | China. |
| 119* | 22* | 1 | | | | | 51 | 15* | | | 1.9 | | | |
| 120 | 22 | 5 | | | | | 14 | 38 | | | .5 | | | China. |
| 121* | 22* | 14 | 29 | 50 | 38 | 27 | 38 | 55 | 42.7 | | .9 | | 64 | Assam. |
| 122 | 22 | 16 | | | | | 40 | 37 | 36.0 | 43.7 | | | | Turkestan. Disturbed. |
| 123 | 22 | 21 | | | | | | | | | .8 | | | |
| 124 | 23 | 6 | | | | | | | | | .9 | | | |
| 125 | 23 | 10 | | | | | 25 | | | | .6 | | | |
| 126 | 23 | 12 | | | | | | | | | .7 | | | |
| 127 | 24 | 0 | | | | | 1.7 | | | | .5 | | | |
| 128 | 24 | 3 | | | | | | | | | .9 | | | |
| 129 | 24 | 8 | | | | | | | | | .5 | | | |
| 130 | 24 | 12 | | | | | 31.0 | | | | .9 | | | |
| 131 | 24 | 16 | | | | | | | | | .7 | | | |
| 132 | 25 | 12 | | | | | | | | | .7 | | | |
| 133 | 25 | 17 | | | | | | | | | .5 | | | |
| 134* | 25* | 18 | | | | | 26.5 | 30 | 29 | | | | | |
| 135 | 25 | 19 | | | | | | | | | .2 | | | Burma. |
| 136 | 29 | 13 | | | | | 44 | 32 | | | .9 | | | |
| 137 | 30 | 21 | | | | | 41.9 | | | | 1.3 | | | |

København.

NOTES

- No. 3. July 2. 21^h. Tibet. Strong record. The beginning of *P* not large, condensation; on *E* and *Z* sharp impulse 14^m15^s, and again 14^m19^s, followed by large oscillations. On *N* increase of movement 14^m35^s. *S* not sharp on *E*, about 22^m4, followed by increasing oscillations; on *N* a definite beginning 22^m31^s and an impulse 22^m55^s, followed by larger movement. *L* begins earliest on *N*, 33^m, with waves of very long period (movement of shorter period superposed); *M* c. 40^m. On *E*, *L* begins about 36^m; c. 46^m a small group of large oscillations on *E* and *Z*.
- No. 21. July 13. 19^h. China. *P*, condensation, and *S* well-defined phases. *M* earliest on *N*, irregular.
- No. 23. July 14. 22^h. Central America. *P* small, in minute-break. *PP* about 56^m3. *S_cP_cS*(?) begins 63^m44^s on *N*, less clearly on *E*, about 63^m7; on *E* well marked impulse 63^m55^s, *S_n*(?); simultaneous increase of movement on *N*. *L* c. 75^m, regular, of long duration.
- No. 33. July 22. 19^h. *eP*, 37^m10^s, not quite certain; *iP*, 37^m11^s, large oscillation; condensation; followed by irregular movement, possibly other phases. *S* and following phases: 47^m6^s, 48^m0, best marked on *E*.
- No. 34. July 23. 0^h. Italy. *P* read from *W-A E*, on other records in minute-break. *S* earliest on *E*; 15^m15^s *S'* begins on *N* and increases on *E*. Very large *M*, on *E* shortly after *S*, on *N* about 1¹/₂ min. later.
- No. 54. Aug. 2. 16^h. Small, but following phases clearly marked: *e_Z* 26^m2; *e_{E,Z}* 30^m5; *e_{E,Z}* 30^m9; *e_E* 37^m24^s; *e_E* 40^m9.
- No. 58. Aug. 4. 5^h. Very clearly marked forerunners and no main phase. It does not seem possible to identify the phases by means of the ordinary time-curves and it is presumably a deep focus shock. *P_Z* 16^m47^s; (*pP*)_{*E,Z*} 19^m3^s, stronger; *e_{E,Z}* 23^m44^s. (*S*) 26^m18^s and (*SP*) 27^m0^s, both very clearly marked on *N* and *E*, the latter phase the stronger and recorded on *Z* also. *e_{E,Z}* 28^m3; (*sS*)_{*E*} 30^m7; *e_{N,E}* 31^m1; *e_N* 33^m43^s; *e_N* 35^m6; *e_E* 37^m2; *e_N* 39^m4.
- No. 75. Aug. 18. 10^h. Atlantic Ocean; △ = c. 115°. No *GE* record. *P* and *P'*, 12^m6, small; *PP* 13^m22^s sharp and large. *e_E* 18^m20^s. *S_cP_cS* 19^m8^s, *S_cP_cP_cS* 20^m25^s, both clearly marked on *N* and *E*; *S_E* 21^m6; *PS* 23^m10^s clearly marked. *SS* 28^m9; *SSS* 33^m2. *M* regular, largest on *N*.
- No. 78. Aug. 20. 21^h. Formosa. Forerunners small. *L* begins very clearly with waves of long period. A large *M* group on *N*.
- No. 84. Aug. 23. 11^h. Persia. Stronger than no. 74 from the same epicentral region. *S* clearly marked. *L* irregular, the beginning uncertain; no pronounced *M* groups.
- No. 104. Sept. 11. 12^h. Dilatation. Phase division very clear. *L* late, *M* almost at beginning.
- No. 118. Sept. 21. 23^h. First forerunners small; *PP_Z* 17^m40^s; *PPP* 19^m13^s. *S* well marked, but the beginning not sharp. *e_N* 25^m2; *SS* 28^m3, large on *E*; *SSS* 31^m4. *L* irregular; a large *M* group on *N*.
- No. 119. Sept. 22. 1^h. *P'_Z* 51^m15^s, in minute-break; later forerunners distinct, but phases not clearly marked. *L* regular, of long duration.
- No. 121. Sept. 22. 14^h. Assam. Wiechert records only. *P* clearly marked on *Z*, condensation; followed by impulse 30^m7^s. *S* and following phases clearly marked on *N*, hardly visible on *E*.
- No. 134. Sept. 25. 18^h. Forerunners read on *Z*; seem to belong to a distant shock, the regular *L* waves of which are seen after the less regular, but larger *L* waves of the next shock.

Geodætisk Institut
Proviantgaarden, Copenhagen, Denmark.

Bulletin
of the seismological station

KØBENHAVN

$\varphi = 55^{\circ}41' N.$ $\lambda = 12^{\circ}27' E.$ $h = 13$ m.

Lithologic foundation: chalk.

No. 16. Oct.—Dec. 1930.

Instruments:

Galitzin pendulums with galvanometric registration.

Constants:

| Component | l | T_1 | A_1 | μ^2 | T | k |
|-----------|------|-------|-------|---------|------|-----|
| | cm | sec | cm | | sec | |
| <i>N</i> | 12.5 | 12.63 | 100 | 0.15 | 12.6 | 105 |
| <i>E</i> | 12.5 | 12.69 | 100 | 0.1 | 12.6 | 100 |
| <i>Z</i> | 14.4 | 11.55 | 100 | -0.1 | 10 | 95 |

Wiechert 1000 kg. horizontal seismograph.

Wiechert 1300 kg. vertical seismograph.

Constants:

| Component | T | ν | ρ | V |
|-----------|-----|-------|--------|-----|
| | sec | | mm | |
| <i>N</i> | 9.7 | 4.6 | 0.7 | 223 |
| <i>E</i> | 9.6 | 4.6 | 0.5 | 194 |
| <i>Z</i> | 5.7 | 4.2 | 0.2 | 160 |

Milne-Shaw seismographs, *N* and *E* components, with the approximate constants $T = 12^s$ $\nu = 20$ $V = 300$

Wood-Anderson torsion seismometer, *E* component, $T = c. 4^s$, recording intermittingly.

København.

| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|-----|--------|------|-------------|------------|--------------|------------|------------|------------|----|---------------------------|
| | | | P | S | | | | | | |
| | 1930 | | <i>m s</i> | <i>m s</i> | <i>h m s</i> | <i>m s</i> | <i>h m</i> | <i>h m</i> | ° | |
| 1 | Oct. 1 | 3 | | | | | .6 | | | |
| 2 | 1 | 14 | | | | | .7 | | | |
| 3 | 2 | 1 | | | .0 | 6.0 | .5 | | | |
| 4 | 2 | 10 | | | 22.7 | | .7 | | | |
| 5 | 2 | 15 | | 45 13 | | | .9 | | | Persia. |
| 6 | 3 | 19 | | | | | .1 | | | |
| 7 | 4 | 0 | | | | | .0 | | | |
| 8 | 5 | 19 | | | | | .7 | | | |
| 9 | 7 | 21 | | 5.0 | | | | 12 | | Persia. |
| 10 | 7 | 23 | | | | | | | 31 | The Alps. |
| 11* | 8* | 10 | | | 38.6 | 41.4 | 1.3 | | | |
| 12 | 9 | 22 | | | | | .0 | | | |
| 13 | 10 | 0 | | 56 57* | | | 1.2 | | | Burma. |
| 14* | 11* | 3 | i 10 49 | 14 28 | 14 46 | | | 15 | 20 | Greenland Sea. |
| 15 | 12 | 15 | | | | | | 29 | | |
| 16 | 13 | 20 | | | | | .2 | | | |
| 17 | 15 | 10 | | | | | .1 | | | |
| 18 | 15 | 22 | | | | | .0 | | | Faint. |
| 19 | 16 | 22 | | | | | .3 | | | |
| 20 | 17 | 9 | | | 6.0 | 13.0 | .6 | | | Disturbed. |
| 21 | 19 | 11 | | | | | .9 | | | Faint. |
| 22 | 21 | 19 | | | 17 10 | | .4 | | | |
| 23 | 22 | 19 | | | | | .2 | | | |
| 24 | 23 | 9 | | | 35 | | 1.1 | | | Disturbed. |
| 25 | 24 | 0 | | | | | | | 59 | Faint. |
| 26 | 24 | 11 | | 3.6 | 7.3 | | .2 | | | Gulf of Aden. |
| 27* | 24* | 20 | 28 37 | 39 51 | 32 34 | 39 12 | 1.0 | | 97 | Marianne Islands. |
| 28 | 25 | 12 | 13 37 | | | | .6 | | | Alaska. |
| 29 | 25 | 16 | | | 45.1 | | .9 | | | |
| 30 | 25 | 17 | | | 58.1 | | .2 | | | |
| 31 | 25 | 23 | | | | | .8 | | | |
| 32 | 26 | 7 | | | | | | 21 | | Not very distant. |
| 33 | 26 | 7 | | | | | | 38 | | " " " |
| 34 | 26 | 22 | | | | | .9 | | | |
| 35 | 27 | 23 | | | 44.8 | | .9 | | | |
| 36* | 28* | 21 | 24.0 | | 27 48 | 34 23 | .9 | | | Marianne Islands. |
| 37* | 30* | 7 | | 18 35 | 18 45 | | | | | Italy. |
| 38 | 31 | 11 | | | .0 | | .4 | | | Strong microseisms. |
| 39* | 31* | 23 | i 16 48 | i 16 55 | | | | | | |
| | Nov. | | | | | | | | | |
| 40 | 3 | 19 | | | | | .7 | | | Faint preceding movement. |
| 41 | 4 | 5 | | | | | .3 | | | |
| 42 | 4 | 15 | 48.9 | 57 52 | | | 1.2 | | 67 | Burma. |
| 43 | 7 | 6 | 1 53 | 6.0 | | | | 9 | 24 | Caucasus. |
| 44 | 8 | 3 | | i 44 46 | 39 20 | | | | | |
| 45* | 9* | 19 | | | 27.3 | | .9 | | | |
| 46 | 10 | 14 | | | .2 | | .7 | | | Disturbed. |
| 47 | 12 | 19 | | | | | .9 | | | |
| 48 | 17 | 12 | | | 45 | | 1.0 | | | |

København.

| No. | Date | Hour | Forerunners | | | | L | Un-defined | △ | Remarks |
|-----|----------|------|-------------|------------|--------------|------------|------------|------------|---|---------------------------|
| | | | P | S | | | | | | |
| | 1930 | | <i>m s</i> | <i>m s</i> | <i>h m s</i> | <i>m s</i> | <i>h m</i> | <i>h m</i> | ° | |
| 49* | Nov. 21* | 2 | 4 11 | 7 26 | | | 9 | | | 17 Adriatic Sea. |
| 50 | 22 | 15 | | | .0 | | .4 | | | |
| 51 | 24 | 4 | | | | | .2 | | | Faint preceding movement. |
| 52 | 24 | 6 | | | | | | 31 | | |
| 53* | 25* | 19 | 14.9 | 24 52 | 18 1 | 30.0 | .7 | | | 78 Japan. |
| 54 | 26 | 16 | | | | | .2 | | | |
| 55 | 28 | 7 | | | 48.9 | 56 30 | 1.3 | | | |
| 56 | 30 | 1 | | | | | .0 | | | |
| 57 | 30 | 22 | | | .0 | | .2 | | | |
| | Dec. | | | | | | | | | |
| 58* | 2* | 7 | | | | | .6 | | | 70 Burma. |
| 59* | 3* | 19 | 3 12 | 12 30 | 5 52 | | | | | " |
| 60 | 6 | 7 | | | 24.3 | | .6 | | | |
| 61 | 8 | 7 | | | | | .0 | | | |
| 62 | 8 | 8 | 13.2 | 23 19 | | | .7 | | | P small. |
| 63 | 8 | 17 | | | 41.5 | 65.0 | 1.7 | | | |
| 64 | 9 | 20 | | | | | .1 | | | |
| 65* | 10* | 10 | 36.7 | 40 58 | | | | | | Armenia. |
| 66 | 11 | 9 | | | | | .7 | | | |
| 67 | 12 | 3 | | | | | .5 | | | |
| 68 | 13 | 15 | | | | | .0 | | | |
| 69 | 15 | 16 | | | | | | 43 | | |
| 70 | 16 | 19 | | | | | | 36 | | |
| 71 | 20 | 14 | | | | | .7 | | | |
| 72 | 21 | 12 | | | | | .9 | | | |
| 73* | 21* | 15 | 3 36 | 13 44 | 6.9 | 15.0 | | | | 79 Formosa. |
| 74 | 22 | 0 | | | | | .6 | | | Superposed on next shock. |
| 75 | 22 | 0 | | | | | .8 | | | |
| 76 | 22 | 5 | | | | | | 3 | | |
| 77 | 23 | 6 | | | | | .1 | | | |
| 78 | 23 | 22 | | | | | .5 | | | Small preceding movement. |
| 79 | 24 | 0 | | | | | .6 | | | |
| 80 | 24 | 6 | | | .6 | | .8 | | | |
| 81 | 25 | 12 | | | | | | 45 | | |
| 82 | 25 | 13 | | | 20 | | .9 | | | |
| 83 | 30 | 19 | | | | | .2 | | | |

København.

NOTES

- No. 11. Oct. 8. 10^h. New Hebrides region; $\Delta = c. 135^\circ$. Distinct forerunners, but phases not clearly marked. Much microseismic movement. The first *L* waves have periods of more than 1 min.
- No. 14. Oct. 11. 3^h. Greenland Sea NW. of Jan Mayen. The record is of an unusual appearance. *P* (condensation) and the following oscillations (period *c.* 6^s) are relatively very large, on the records, in all components, larger than *S*. On *E*, *S* is clearly marked by a somewhat irregular movement beginning 14^m28^s. On *N* the second forerunner begins 14^m46^s with a few regular oscillations. *L* waves of long period shortly after *S*; in *M* the period about 18^s.
- No. 27. Oct. 24. 20^h. Marianne Islands; $\Delta = 96^\circ.5$. *P* small, readable on *Z* only. e_z 31^m.8; *PP*, 32^m34^s, large and sharp; e_z 33^m.5; e_z 34^m54^s. $\overline{S_c P_c S}$ 39^m12^s, *PS* 41^m15^s, *SS* 46^m20^s, all large and sharp.
- No. 36. Oct. 28. 21^h. Marianne Islands. *P* small, the reading uncertain; *PP* 27^m48^s well marked. $\overline{(S_c P_c S)}$ 34^m23^s, small; *PS*, 37^m.0, larger; *SS*, 41^m.7, well marked.
- No. 37. Oct. 30. 7^h. Italy. $\Delta = c. 12^\circ$. *P* very faint, perhaps 16^m.2; *L* large, earliest on *E*.
- No. 39. Oct. 31. 23^h. 55°17' N. 12°46' E. Felt in Denmark and Sweden.
- No. 45. Nov. 9. 19^h. N. of New Guinea; $\Delta = c. 110^\circ$. Phases not clearly marked; disturbed by strong microseisms. First discernible movement about 27^m.3. Clearest marked impulses: e_E 34^m46^s; e_N 34^m53^s; e_E 36^m54^s; e 42^m.4. *L* begins earliest on *N* with waves of long period.
- No. 49. Nov. 21. 2^h. *P* and *S* small; masked by microseisms; the readings not quite certain.
- No. 53. Nov. 25. 19^h. Japan. *P* begins very faintly about 14^m.9, larger movement 14^m59^s. *PP* *c.* 17^m.9, large impulse 18^m1^s. *S* followed by much movement. *M* large.
- No. 58. Dec. 2. 7^h. Burma. Forerunners masked by strong microseismic movement: *P* *c.* 12^m.4; *S* *c.* 21^m.3.
- No. 59. Dec. 3. 19^h. Burma. Very strong record. Seconds in readings hardly reliable owing to strong microseismic movement. *PP* 5^m52^s; *PPP* 7^m50^s, stronger. *S* large and followed by large oscillations. *SS* *c.* 16^m.4. On *E* movement of longer period begins about 18^m and increases into very large oscillations about 21^m; then follows smaller movement; large *L* waves of period of more than 1 min. begin about 26^m. On *N*, *L* waves of long period begin about 20^m; very large *M* between *c.* 30^m and 38^m; on *E* largest *M* later and considerably smaller.
- No. 65. Dec. 10. 10^h. Armenia. The beginning of *P* not sharp. *S* large. The beginning of *L* uncertain, *c.* 45^m.
- No. 73. Dec. 21. 15^h. Formosa. The beginning of *P* faint, the reading not quite certain; *iP* 3^m39^s, a large oscillation. *L* irregular, small, the beginning uncertain.