

AIR MINISTRY
METEOROLOGICAL OFFICE

THE
OBSERVATORIES'
YEAR BOOK

1951

Comprising the meteorological and geophysical results
obtained from autographic records and eye observations
at the Lerwick, Eskdalemuir, and Kew Observatories

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PREFACE

The *Observatories' Year Book* was published for the years 1922 to 1937 in continuation of Part III Section II and Part IV of the *British Meteorological and Magnetic Year Book* for the period 1908 to 1921.

Publication of the *Observatories' Year Book* was necessarily suspended during the 1939-45 war. Restriction on supplies and printing since the war resulted in a regrettably long delay in the resumption of publication. In face of the formidable accumulation of arrears, and taking changed requirements into account, it was decided to adopt an abridged form as outlined below.

It was arranged that the General Introduction to the Meteorological Tables and the parts of the Sectional Introduction which deal with site, instruments, procedure and tabulation included in the volume for 1938 should serve as standards of reference for many years; and that only important departures from these standards, together with any requisite additional information should be included in the relevant parts of the volume for the years after 1938. As compared with the volumes before 1938, the space devoted to the discussion of observations is reduced. Monthly tables of individual hourly values of meteorological elements are omitted, but summaries of daily mean values (or totals), monthly means (or totals) of hourly values and some maximum and minimum values are given. The diary of cloud, weather and visibility is also omitted. No major changes have been made in the atmospheric electrical and magnetic tables. The aerological and seismological tables were discontinued after 1939.

The present volume, 1951, presents atmospheric electrical and geomagnetic data for Lerwick Observatory; meteorological, atmospheric electrical and geomagnetic data for Eskdalemuir; meteorological, atmospheric electrical and atmospheric pollution data for Kew. Aberdeen Observatory closed at the end of 1947.

Manuscript tabulations of hourly values of the meteorological elements are available at the observatories. Requests for information from these tabulations should be addressed to the Director-General, Meteorological Office, Air Ministry, Victory House, Kingsway, London, W.C.2.

NOTES ON THE TABLES. — Maximum and minimum values are shown in italics
In this and future volumes the symbol *Z* for Vertical Force is used in place
of *V*. Similarly, *F*, for Total Force is substituted for *T*.

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ERRATA IN PREVIOUS VOLUMES

Observatories' Year Books, Eskdalemuir, Rainfall

1943) Table 88

1945)

1946 Table 101

1947 Table 99

1948)

1950) Table 79

In the heading to the above tables the height of the station above M.S.L. is quoted as "24.1 m." instead of "242.0 m." and the height of the receiving surface above ground as "0.6 m." instead of "0.4 m."

Observatories' Year Books

1944 Page 75, Table 98. Heading. After "7h." add † and after footnote commencing "The minimum "on the grass" etc." to read:- †From January to July the minimum "on the grass" refers to the interval from 18h. on the previous day to 7h. on the day to which it is entered. From August 1944 onwards the period ends at 6h.

1945 Page 77, Table 98, Heading and second footnote. For "7h." read "9h."

1946 Page 85, Table 111, Heading and second footnote. For "7h." read "9h."

1947 Page 73, Table 109, Heading and second footnote. For "7h." read "9h."

1948)

1949) Page 59, Table 89, Heading and second footnote. For "7h." read "9h."

1950)

Observatories' Year Book, 1947

Page 126, Table 193, amend heading to read:- "Minimum Temperature "on the grass" during the interval 21h. to 9h. G.M.T."

Page 126, second line of footnote, after "interval" read:- "from 21h. on the previous day to 9h. on the day to which it is entered."

Observatories' Year Book, 1948

Page 57, Table 84, January, Hours 7-8 and 16-17, for "-" read "..."

Page 112, second line of footnote, after "interval" read:- "from 21h. on the previous day to 9h. on the day to which it is entered."

Observatories' Year Books, 1948, 1949

Kew Observatory Introduction, Notes on the instruments, Rainfall, line 9. For "16h." read "18h."

Kew Observaroty Introduction, Notes on the instruments, Solar radiation, line 1. For "1938" read "1939."

Page 112, Table 173, amend heading to read:- "Minimum Temperature "on the grass" during the interval 21h. to 9h., G.M.T."

LERWICK



LERWICK OBSERVATORY

Latitude 60°08'N.
Longitude 1°11'W.
G.M.T. of Local Mean Noon 12h. 5m.
Height of site above M.S.L. 80 to 90 metres

INTRODUCTION

Full details of the site, instruments procedure and tabulations are given in the *Observatories' Year Book*, 1938. Only important changes and additions are mentioned here.

Atmospheric electricity

No changes were made in 1951

Terrestrial magnetism

Until 1946 the chamber was unheated but in June of that year small, low temperature thermostatically controlled a.c. electric heaters were installed in order to reduce the persistent damp. The diurnal variation of temperature has continued negligibly small.

The average day-to-day change of temperature in the magnetograph house for each of the twelve months of 1951 and for the year as a whole was as follows (in degrees Absolute):

| Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year |
|------|------|------|------|-----|------|------|------|-------|------|------|------|------|
| ·15 | ·21 | ·24 | ·19 | ·21 | ·17 | ·22 | ·17 | ·23 | ·28 | ·29 | ·32 | ·22 |

There were 6 occasions on which the change reached or exceeded 1°A.

Notes on the Results

Beginning with 1947 some changes have been made in the tables accompanying these notes. The month by month commentary on the autographic records has been omitted, and a change has been made in the table formerly headed "Principal magnetic disturbances". It is intended that all the disturbances, which would have been included in the previous type of table, will still be included, with, however, additional disturbances of the form of sudden commencements and those which can be recognised as being solar flare effects. The table is thus divided into three parts:

- (a) Disturbances noteworthy for some reason (usually, but not always, range) and without a sudden commencement.
- (b) Well marked sudden commencements whether followed by a large disturbance or not.
- (c) Disturbances accompanying a solar flare or other known solar flare effect.

The time given of commencement and ending of disturbances in (a) must depend on an arbitrary judgment. The list of sudden commencements under (b) will usually be a little shorter than that given in the I.A.T.M.E. Bulletins because a somewhat stricter meaning has been given to the words "well marked", and also because the sharp beginnings of small polar disturbances have been omitted. The (c) table has been made as complete as possible by a careful scrutiny of the magnetograms at the time of any known solar flare or solar flare effect, but a small "crochet" can easily be masked by other disturbances. The signs

given to the movements of H , D and Z are positive for increasing H , Z and an increase of force towards the east (that is a decreasing westerly declination).

Particulars of the same disturbances are given in both the Lerwick and the Eskdalemuir sections of the *Observatories' Year Book*, even if the disturbance at one of the stations is relatively small.

The factor to change variations of D expressed in minutes of arc to units of force (γ) perpendicular to the magnetic meridian was approximately 4.19. Comparing the mean values for all days of 1951 with those for 1950 it is noted that H increased by 14γ , D (West) decreased by 7.8 and Z increased by 22γ . The ranges between the extreme values recorded in 1951 were H 2512 γ , D 7°2'6 and Z 1231 γ .

The K index is fully described in *Terrestrial magnetism and atmospheric electricity**. Briefly a figure is allotted on a scale 0-9 to each 3-hour interval. The figure is a measure of the range of magnetic force during that period, measured from a curved line which represents the normal quiet day variation. The figures are first allotted from the H magnetogram, and then increased, if necessary, by inspection of the D and Z curves, so that the most disturbed component determines the final figure. The scale of ranges in γ corresponding to the figures 0-9 varies from observatory to observatory. The lower limit of each number for Lerwick is

| | | | | | | | | | | |
|----------|---|----|----|----|----|-----|-----|-----|-----|------|
| K | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| γ | 0 | 10 | 20 | 40 | 80 | 140 | 240 | 400 | 660 | 1000 |

TABLE 1 - ABSOLUTE DAILY RANGE AND MEAN MONTHLY VALUES

| | Mean absolute daily range | | | | | | Mean daily range expressed as percentage of yearly mean | | | | | |
|-----------|---------------------------|----------|----------|--------------|----------|----------|---|-----|-----|--------------|-----|-----|
| | 1951 | | | Mean 1932-42 | | | 1951 | | | Mean 1932-42 | | |
| | H | D | Z | H | D | Z | H | D | Z | H | D | Z |
| | γ | γ | γ | γ | γ | γ | % | % | % | % | % | % |
| January | 93 | 114 | 115 | 94 | 96 | 96 | 39 | 76 | 60 | 65 | 92 | 80 |
| February | 181 | 146 | 178 | 110 | 106 | 114 | 76 | 98 | 92 | 76 | 102 | 95 |
| March | 226 | 134 | 181 | 196 | 138 | 165 | 95 | 90 | 94 | 136 | 133 | 137 |
| April | 300 | 161 | 251 | 206 | 123 | 160 | 126 | 108 | 130 | 143 | 118 | 133 |
| May | 274 | 156 | 179 | 181 | 103 | 129 | 115 | 105 | 93 | 126 | 99 | 107 |
| June | 250 | 127 | 169 | 135 | 88 | 100 | 105 | 85 | 87 | 94 | 84 | 83 |
| July | 278 | 143 | 188 | 153 | 90 | 107 | 117 | 96 | 97 | 106 | 86 | 89 |
| August | 208 | 123 | 190 | 151 | 98 | 108 | 87 | 82 | 98 | 105 | 94 | 90 |
| September | 483 | 253 | 334 | 159 | 114 | 138 | 203 | 169 | 173 | 111 | 110 | 115 |
| October | 266 | 167 | 211 | 160 | 119 | 141 | 112 | 112 | 109 | 111 | 114 | 117 |
| November | 156 | 142 | 173 | 93 | 92 | 99 | 66 | 95 | 90 | 65 | 88 | 82 |
| December | 144 | 126 | 149 | 85 | 87 | 88 | 61 | 85 | 77 | 59 | 84 | 73 |
| Winter | 143 | 132 | 154 | 96 | 95 | 100 | 60 | 89 | 80 | 67 | 91 | 83 |
| Equinox | 319 | 179 | 244 | 180 | 124 | 151 | 134 | 120 | 126 | 125 | 119 | 126 |
| Summer | 252 | 137 | 181 | 155 | 95 | 111 | 106 | 92 | 94 | 108 | 91 | 92 |
| Year | 238 | 149 | 193 | 144 | 104 | 120 | .. | .. | .. | .. | .. | .. |

"Winter" comprises the four months January, February, November, December; "Equinox" the months March, April, September, October; and "Summer" May to August.

*BARTELS, J., HECK, N.H. and JOHNSTON, H.F.: The three-hour-range index measuring geomagnetic activity. *Terr. Magn. atmos. Elect.*, Baltimore, 44, 1939, p.411.

TABLE 2 - FREQUENCY DISTRIBUTION OF ABSOLUTE DAILY RANGE

| Range | Number of cases, 1951 | | | Percentage distribution | | | | | |
|--------------|-----------------------|----|-----|-------------------------|---------|------|---------|------|---------|
| | H | D | Z | H | | D | | Z | |
| | | | | 1951 | 1932-42 | 1951 | 1932-42 | 1951 | 1932-42 |
| γ | | | | % | % | % | % | % | % |
| 0 - 9 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| 10 - 19 | 2 | 1 | 11 | 0.5 | 1.0 | 0.3 | 0.4 | 3.0 | 15.8 |
| 20 - 29 | 9 | 2 | 12 | 2.5 | 4.2 | 0.5 | 2.9 | 3.3 | 22.1 |
| 30 - 39 | 11 | 8 | 16 | 3.0 | 6.6 | 2.2 | 5.7 | 4.4 | 16.8 |
| 40 - 49 | 18 | 11 | 19 | 4.9 | 8.7 | 3.0 | 8.0 | 5.2 | 9.5 |
| 50 - 59 | 15 | 18 | 21 | 4.1 | 11.4 | 4.9 | 13.2 | 5.7 | 6.9 |
| 60 - 69 | 20 | 23 | 17 | 5.5 | 13.2 | 6.3 | 14.0 | 4.6 | 5.1 |
| 70 - 79 | 22 | 32 | 10 | 6.0 | 10.6 | 8.7 | 12.5 | 2.7 | 3.4 |
| 80 - 89 | 23 | 32 | 17 | 6.3 | 9.3 | 8.7 | 10.3 | 4.6 | 2.7 |
| 90 - 99 | 24 | 37 | 12 | 6.6 | 6.9 | 10.1 | 7.8 | 3.3 | 2.3 |
| 100 - 109 | 18 | 24 | 13 | 4.9 | 5.3 | 6.6 | 5.3 | 3.5 | 1.8 |
| 110 - 119 | 16 | 22 | 12 | 4.4 | 4.5 | 6.0 | 3.8 | 3.3 | 1.4 |
| 120 - 129 | 10 | 16 | 12 | 2.7 | 2.9 | 4.4 | 3.3 | 3.3 | 1.4 |
| 130 - 139 | 11 | 9 | 12 | 3.0 | 2.7 | 2.5 | 2.5 | 3.3 | 0.9 |
| 140 - 149 | 16 | 12 | 12 | 4.4 | 1.8 | 3.3 | 1.8 | 3.3 | 0.8 |
| 150 - 159 | 5 | 9 | 8 | 1.4 | 1.9 | 2.5 | 1.6 | 2.2 | 0.4 |
| 160 - 169 | 4 | 17 | 9 | 1.1 | 1.3 | 4.7 | 1.4 | 2.5 | 0.5 |
| 170 - 179 | 8 | 7 | 5 | 2.2 | 1.0 | 1.9 | 0.8 | 1.4 | 0.2 |
| 180 - 189 | 4 | 9 | 5 | 1.1 | 0.8 | 2.5 | 0.8 | 1.4 | 0.5 |
| 190 - 199 | 4 | 5 | 10 | 1.1 | 0.6 | 1.4 | 0.7 | 2.7 | 0.4 |
| 200 + | 125 | 71 | 132 | 34.2 | 5.2 | 19.4 | 3.1 | 36.0 | 4.0 |
| Days omitted | 0 | 0 | 0 | .. | .. | .. | .. | .. | .. |

TABLE 3 - AVERAGE RANGE OF DIURNAL INEQUALITY 1932-42 WITH 1951 AS PERCENTAGE OF THIS

| | | All days | | | International quiet days | | | International disturbed days | | |
|---------|---------|---------------|---------------|--------|--------------------------|---------------|--------|------------------------------|----------------|---------|
| | | Z | H | D | Z | H | D | Z | H | D |
| Year | 1932-42 | γ 47.5 | γ 46.7 | ' 9.04 | γ 9.3 | γ 36.5 | ' 8.30 | γ 118.9 | γ 117.1 | ' 13.55 |
| | 1951(%) | 168 | 141 | 114 | 151 | 108 | 111 | 138 | 161 | 104 |
| Winter | 1932-42 | 38.0 | 23.4 | 7.60 | 7.3 | 14.7 | 4.32 | 110.2 | 79.3 | 12.83 |
| | 1951(%) | 161 | 127 | 125 | 141 | 93 | 121 | 145 | 103 | 122 |
| Equinox | 1932-42 | 60.0 | 54.3 | 10.60 | 11.6 | 41.4 | 9.25 | 150.3 | 167.2 | 18.61 |
| | 1951(%) | 174 | 175 | 115 | 150 | 97 | 105 | 134 | 184 | 91 |
| Summer | 1932-42 | 47.6 | 69.7 | 12.38 | 15.6 | 55.8 | 12.14 | 124.3 | 140.3 | 14.59 |
| | 1951(%) | 158 | 120 | 108 | 164 | 122 | 121 | 122 | 162 | 123 |

"Winter" comprises the four months January, February, November, December; "Equinox" the months March, April, September, October; and "Summer" May to August.

TABLE 4 - RATIO OF RANGE OF INEQUALITY AT LERWICK TO THAT AT ESKDALEMUIR 1951

| Type of day | Element | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-------------|---------|------|------|------|------|------|------|------|------|-------|------|------|------|
| q | D | 1.15 | 1.07 | 1.05 | 1.12 | 1.11 | 1.13 | 1.08 | 1.14 | 1.05 | .94 | 1.22 | 1.11 |
| d | D | 1.29 | 1.48 | 1.22 | 1.18 | 1.36 | 1.36 | 1.89 | 1.37 | 1.17 | 1.32 | 1.26 | 1.17 |
| q | H | .87 | 1.06 | .95 | 1.13 | 1.22 | 1.05 | 1.19 | 1.10 | .96 | .98 | .96 | .94 |
| d | H | 2.55 | 3.80 | 8.43 | 2.53 | 3.23 | 2.39 | 4.07 | 2.60 | 3.69 | 1.70 | 3.75 | 1.78 |
| q | Z | 1.24 | 1.24 | 1.64 | 1.16 | .83 | 1.17 | 1.48 | 1.22 | 2.41 | .70 | 1.30 | 1.97 |
| d | Z | 2.08 | 2.34 | 1.94 | 2.27 | 1.20 | .96 | .92 | 1.96 | 1.07 | 1.32 | 2.42 | 2.04 |

TABLE 5 - NOTEWORTHY MAGNETIC DISTURBANCES AT LERWICK

(a) Disturbances without S.C.'s

| Serial Number | From | | To | | Range (γ) | | | Notes |
|---------------|----------|------|----------|------|--------------------|----------|----------|-----------------|
| | Date | Hour | Date | Hour | H | D | Z | |
| 1a | Feb. 27 | 00 | Feb. 27 | 09 | γ | γ | γ | ? S.C. at 00.28 |
| 2a | Mar. 13 | 13 | Mar. 14 | 08 | 581 | 457 | 372 | |
| 3a | Mar. 14 | 12 | Mar. 15 | 06 | 1110 | 291 | 539 | |
| 4a | Mar. 22 | 14 | Mar. 23 | 05 | 767 | 287 | 488 | |
| 5a | Apr. 20 | 12 | Apr. 23 | 07 | 837 | 249 | 390 | |
| 6a | Apr. 24 | 04 | Apr. 26 | 03 | 825 | 361 | 450 | |
| 7a | May 1 | 00 | May 2 | 03 | 771 | 296 | 456 | |
| 8a | Aug. 21 | 10 | Aug. 22 | 09 | 1170 | 623 | 713 | |
| 9a | Sept. 13 | 11 | Sept. 14 | 06 | 981 | 238 | 586 | |
| 10a | Sept. 19 | 14 | Sept. 23 | 08 | 983 | 202 | 419 | |
| 11a | Sept. 25 | 10 | Sept. 26 | 07 | 1464 | 558 | 582 | |
| | | | | | 2306 | 1771 | 987 | |

(b) Disturbances with a S.C.

| Serial Number | Date | Time of S.C. | End of Disturbance | | With initial reversed stroke | | | Magnitude main stroke of S.C. | | | Range of following disturbance (γ) | | | |
|---------------|---------|--------------|--------------------|------|------------------------------|-----|-----|-------------------------------|----------|----------|---|------|------|-------|
| | | | Date | Hour | H | D | Z | H | D | Z | H | D | Z | |
| 1b | Feb. 28 | 14.17 | | | Yes | Yes | Yes | γ | γ | γ | | | | Small |
| 2b | Mar. 6 | 07.50 | | | No | No | No | +48 | -19 | +12 | | | | Small |
| 3b | Mar. 7 | 12.27 | | | ? | ? | ? | +13 | -8 | +6 | | | | Small |
| 4b | Mar. 16 | 10.04 | | | Yes | Yes | Yes | -36 | +14 | -6 | | | | Small |
| 5b | Apr. 18 | 06.52 | Apr. 19 | 03 | ? | Yes | Yes | -7 | +10 | -5 | 449 | 284 | 382 | |
| 6b | May 25 | 18.40 | May 27 | 06 | Yes | No | No | ? | +23 | -6 | 883 | 342 | 500 | |
| 7b | June 14 | 17.51 | | | No | No | Yes | +88 | -17 | -24 | | | | Small |
| 8b | June 17 | 17.02 | June 18 | 10 | No | No | No | +74 | -19 | -24 | 1449 | 667 | 985 | |
| 9b | June 18 | 23.14 | | | No | No | No | +31 | -4 | -9 | | | | Small |
| 10b | June 25 | 04.28 | June 25 | 24 | No | No | No | +18 | -21 | -4 | 515 | 152 | 396 | |
| 11b | July 1 | 22.28 | July 2 | 12 | No | No | No | +24 | ? | ? | 1760 | 1026 | 1071 | |
| 12b | July 31 | 00.59 | Aug. 1 | 04 | No | No | No | +12 | ? | ? | 658 | 224 | 407 | |
| 13b | Aug. 15 | 20.10 | | | No | No | Yes | +56 | -23 | -24 | | | | Small |
| 14b | Sept. 5 | 20.45 | | | No | No | No | +60 | -16 | -15 | | | | Small |
| 15b | Oct. 28 | 11.54 | Oct. 29 | 02 | | | | Oscillatory | | | 1527 | 806 | 980 | |
| 16b | Dec. 27 | 21.36 | Dec. 29 | 02 | No | No | No | +29 | -12 | -13 | 509 | 352 | 602 | |

(c) Disturbances due to Solar Flare

| Serial Number | Date | Commence-ment | Max. | End | Movement (γ) | | | K | K' | Flare or S.F.E. |
|---------------|--------|---------------|--------------------|-------|-----------------------|----|----|---|----|-----------------|
| | | | | | H | D | Z | | | |
| 1c | May 8 | 15.05 | { 15.20 15.35 } | 16.03 | -33 | -1 | 0 | 2 | 1 | S.F. S.W.F. |
| 2c | May 14 | 11.30 | 11.33 | 11.46 | -4 | -4 | -1 | 2 | 2 | S.W.F. |

S.F. - Solar Flare

S.W.F. - Short wave radio fade out

POTENTIAL GRADIENT (reduced to level surface)
Mean values for periods of sixty minutes between exact hours, G.M.T.

6 LERWICK

| | JANUARY, factor 1.36 | | | | FEBRUARY, factor 1.33 | | | | MARCH, factor 1.32 | | | |
|------|------------------------|--------|---------|---------|-----------------------|-------|---------|---------|--------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 108 | - | 150 | 197 | 218 | 168 | - | - | 101 | 281 | - | - |
| 2 | - | - | 143 | 387 | 106 | 134 | 162 | 106 | 265 | 135 | 270 | 340 |
| 3 | 170 | 194 | - | - | -84 | -229 | -632 | - | 165 | 214 | - | 384 |
| 4 | 247 | 217 | 237 | 296 | - | - | 291 | 268 | - | - | 89 | 117 |
| 5 | 175 | 396 | - | - | 95 | 101 | 112 | 117 | 74 | 573 | - | 142 |
| 6 | - | - | - | -203 | - | - | 280 | 341 | - | - | - | 253 |
| 7 | 165 | 88 | 201 | 407 | 17 | 95 | 268 | 73 | 111 | 210 | 397 | 181 |
| 8 | - | 120 | (553) | 209 | 274 | 363 | (280) | 201 | 136 | 154 | 166 | 142 |
| 9 | 121 | 48 | - | 174 | <-1286 | -626 | 112 | 212 | 72 | 337 | 524 | 144 |
| 10 | -144 | 203 | - | 182 | 56 | 101 | 6 | 168 | 159 | 177 | 177 | 165 |
| 11 | 108 | -27 | 146 | 11 | 50 | 45 | 246 | 201 | 242 | 397 | 254 | (298) |
| 12 | 185 | (1088) | - | 544 | 61 | 95 | 106 | 263 | 251 | 302 | 277 | 245 |
| 13 | -549 | 181 | 280 | - | 112 | 151 | 218 | 291 | 191 | 312 | 280 | 248 |
| 14 | 177 | 100 | 199 | 155 | 67 | 106 | 285 | 235 | -142 | 110 | 233 | -58 |
| 15 | 162 | -84 | 173 | 179 | 386 | 257 | 162 | 162 | 49 | 131 | 197 | (170) |
| 16 | - | - | 162 | 112 | 101 | Z± | 436 | -56 | 139 | 153 | 106 | 239 |
| 17 | - | - | - | 112 | 112 | 112 | -39 | 257 | -7 | -175 | - | 67 |
| 18 | 84 | 179 | 112 | 45 | 162 | 56 | 201 | 207 | 75 | 109 | 170 | 136 |
| 19 | - | - | 184 | 117 | 106 | -50 | - | - | 117 | 159 | 90 | 152 |
| 20 | 67 | 106 | 117 | 117 | - | - | - | - | - | - | 111 | 223 |
| 21 | 112 | 67 | - | - | 94 | 218 | - | (359) | 307 | 266 | 133 | 133 |
| 22 | - | - | 157 | 106 | - | - | - | - | 210 | 133 | -1986 | -87 |
| 23 | 106 | 157 | 157 | 157 | - | - | 58 | (162) | -241 | 67 | 159 | 133 |
| 24 | 89 | 179 | (168) | 240 | <-996 | 52 | - | (115) | 313 | 811 | 149 | 144 |
| 25 | 162 | 168 | 207 | 168 | - | - | - | - | 206 | 82 | - | 144 |
| 26 | 196 | - | 56 | 274 | - | - | 148 | 269 | 221 | 134 | -1055 | 247 |
| 27 | 162 | 234 | 341 | 201 | 164 | - | 121 | 153 | 233 | - | 160 | 227 |
| 28 | 101 | 140 | 224 | 173 | 148 | 116 | 101 | 249 | 140 | 93 | 135 | 161 |
| 29 | 157 | 168 | 324 | 330 | - | - | - | - | 120 | 109 | 307 | 187 |
| 30 | 173 | 157 | 190 | 101 | - | - | - | - | 109 | 214 | 203 | 698 |
| 31 | 129 | 112 | <-1960 | 335 | - | - | - | - | 705 | 172 | 324 | 157 |
| (a) | 143 | 205 | 204 | 205 | 129 | 136 | 189 | 210 | 188 | 224 | 214 | 210 |
| (b) | 140 | 127 | 200 | 184 | 127 | 133 | 162 | 195 | 161 | 213 | 69 | 190 |
| Mean | (a) 189 | | (b) 163 | | (a) 166 | | (b) 154 | | (a) 209 | | (b) 158 | |

| | APRIL, factor 1.39 | | | | MAY, factor 1.37 | | | | JUNE, factor 1.37 | | | |
|------|------------------------|-------|---------|---------|------------------|-------|---------|---------|-------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 141 | 209 | 110 | 42 | 98 | 168 | 125 | 108 | 138 | 178 | 242 | 202 |
| 2 | 131 | 158 | - | - | 114 | 114 | 326 | 255 | 133 | 118 | 108 | 103 |
| 3 | - | - | 237 | - | 114 | 114 | 206 | 11 | 79 | 148 | 128 | 138 |
| 4 | - | - | 158 | 248 | 49 | 16 | (98) | 119 | 118 | 108 | 153 | 153 |
| 5 | -138 | -74 | 122 | 212 | 81 | 185 | 163 | 109 | 177 | 98 | 231 | 98 |
| 6 | -53 | 148 | 212 | 254 | 109 | 158 | 163 | (71) | - | 142 | 128 | 128 |
| 7 | 287 | 255 | 224 | 59 | 120 | 109 | 212 | 180 | 49 | 93 | 108 | 137 |
| 8 | 5 | 75 | 213 | 64 | 141 | 245 | 185 | 212 | 88 | (78) | 98 | 98 |
| 9 | 149 | -117 | -96 | 112 | 180 | 174 | 202 | 256 | 97 | -19 | -63 | 142 |
| 10 | 107 | 133 | 144 | 117 | 109 | 104 | 109 | 53 | -205 | 73 | -102 | 68 |
| 11 | 155 | 160 | (160) | - | 153 | 158 | 147 | 322 | 93 | 97 | 127 | 97 |
| 12 | - | - | - | - | 53 | 53 | 16 | 162 | 73 | 97 | 88 | (58) |
| 13 | 107 | 203 | 161 | (267) | 93 | 71 | 98 | 109 | 151 | - | - | 447 |
| 14 | 1029 | 954 | -286 | 493 | 109 | 271 | 114 | 147 | 145 | 417 | 533 | 189 |
| 15 | 166 | 166 | -627 | 231 | 135 | 71 | 262 | 120 | 97 | 111 | 145 | 145 |
| 16 | 371 | -151 | 328 | 209 | 126 | 191 | 71 | -11 | 131 | 145 | 131 | 290 |
| 17 | 134 | 102 | 156 | 204 | 93 | 169 | 344 | 229 | 348 | (561) | 769 | 58 |
| 18 | 596 | 204 | 226 | 150 | 120 | 360 | 371 | 235 | 150 | -246 | 87 | 97 |
| 19 | 97 | - | 199 | - | 322 | 109 | 251 | 164 | 53 | 5 | 101 | 150 |
| 20 | - | - | - | 134 | 213 | 186 | 93 | 273 | 140 | 189 | 808 | 721 |
| 21 | 162 | 216 | 156 | 146 | 104 | 131 | 44 | 98 | 542 | 300 | 489 | 160 |
| 22 | 162 | 173 | 324 | 216 | 71 | -11 | 49 | 33 | 527 | 329 | 358 | 513 |
| 23 | 324 | 151 | 276 | 162 | 44 | 11 | -88 | 11 | 626 | 344 | 291 | 243 |
| 24 | 135 | 135 | 162 | 178 | - | 129 | 193 | 188 | 194 | 155 | - | - |
| 25 | 113 | 119 | 70 | 65 | 154 | 263 | - | 362 | - | - | 330 | 126 |
| 26 | 151 | (162) | 140 | 70 | 188 | 179 | 144 | 80 | - | - | - | 511 |
| 27 | 173 | 124 | 70 | 108 | 124 | 79 | 59 | 124 | 137 | 161 | 132 | 195 |
| 28 | 33 | 146 | 114 | 97 | 144 | 124 | 104 | 188 | 122 | - | 142 | 151 |
| 29 | 488 | 168 | 163 | 119 | 153 | 134 | 114 | 139 | 147 | 142 | 132 | - |
| 30 | 109 | 163 | 163 | 125 | 99 | - | 104 | 99 | - | 103 | 236 | 290 |
| 31 | - | - | - | - | 122 | 212 | 252 | 203 | - | - | - | - |
| (a) | 222 | 197 | 179 | 163 | 125 | 148 | 159 | 155 | 182 | 175 | 244 | 204 |
| (b) | 207 | 159 | 110 | 161 | 124 | 139 | 151 | 143 | 170 | 154 | 226 | 184 |
| Mean | (a) 190 | | (b) 159 | | (a) 147 | | (b) 139 | | (a) 201 | | (b) 183 | |

The potential gradient is reckoned as positive if the potential increases upwards. For indeterminate potential gradient the following notation is used: Z+, indeterminate, positive value; Z-, indeterminate, negative value; Z±, indeterminate, in magnitude and sign.

(a) Mean of all positive readings

(b) Mean from all complete days using both positive and negative readings.

POTENTIAL GRADIENT (reduced to level surface)
 Mean values for periods of sixty minutes between exact hours, G.M.T.

6 LERWICK

| | JULY, factor 1.41 | | | | AUGUST, factor 1.30 | | | | SEPTEMBER, factor 1.18 | | | |
|------|------------------------|-------|---------|---------|---------------------|-------|---------|---------|------------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 341 | -64 | (-198) | 366 | 544 | 287 | 106 | 353 | 300 | 225 | 441 | (600) |
| 2 | 358 | 189 | 169 | 194 | 407 | 376 | 452 | 376 | - | 235 | 66 | 159 |
| 3 | 95 | 115 | 45 | 155 | 351 | 295 | - | - | 52 | 94 | 113 | 338 |
| 4 | 140 | 140 | 115 | 175 | 469 | 449 | - | 379 | 201 | 267 | 285 | 571 |
| 5 | 45 | 146 | 196 | 251 | - | - | - | 373 | 140 | 80 | 61 | 122 |
| 6 | 101 | 157 | 67 | 167 | 114 | 208 | 134 | 54 | 93 | 56 | 89 | 93 |
| 7 | 152 | 177 | 197 | 101 | 79 | 84 | -246 | 340 | 75 | - | 117 | 215 |
| 8 | 1519 | 132 | 122 | 168 | -98 | 416 | 235 | 505 | 61 | 140 | 158 | 121 |
| 9 | 168 | 87 | 148 | 305 | 779 | 127 | 73 | 78 | - | 107 | 140 | 121 |
| 10 | 194 | 107 | -598 | 158 | 121 | 102 | 97 | 121 | 93 | 126 | 139 | 88 |
| 11 | - | 968 | 783 | 630 | 87 | 111 | 111 | 101 | 177 | 451 | 809 | 618 |
| 12 | - | - | - | - | 144 | 149 | 96 | 91 | 186 | - | 195 | 473 |
| 13 | 87 | 82 | 123 | 108 | 86 | (81) | 53 | -244 | 510 | 227 | - | - |
| 14 | 129 | 154 | 180 | 257 | 96 | 124 | 24 | 0 | -106 | 60 | 213 | 134 |
| 15 | 5 | 258 | 433 | 191 | 71 | 153 | 86 | - | 97 | 125 | 97 | 79 |
| 16 | 46 | 212 | 108 | 155 | - | 90 | 105 | 195 | 5 | 79 | 42 | 88 |
| 17 | 155 | 103 | 253 | 196 | 133 | 437 | 237 | 190 | 84 | 98 | 47 | 47 |
| 18 | 139 | 134 | 155 | 175 | 128 | 285 | (470) | - | 75 | 84 | -257 | 112 |
| 19 | 108 | 98 | 515 | 438 | -38 | 393 | 474 | 332 | -14 | 61 | - | - |
| 20 | 113 | 345 | (57) | 149 | 95 | 24 | 293 | 331 | 57 | - | - | 94 |
| 21 | 283 | 437 | 252 | 108 | 95 | -9 | 293 | 331 | 113 | 222 | 94 | 269 |
| 22 | 200 | 360 | 277 | 915 | (137) | 95 | 156 | 189 | 137 | 137 | 313 | 299 |
| 23 | 97 | -31 | 154 | 251 | 175 | (118) | 90 | 198 | 195 | 248 | 252 | 286 |
| 24 | 164 | 195 | 128 | 251 | 113 | - | 90 | - | -5 | 382 | 315 | 488 |
| 25 | 107 | 512 | 369 | 220 | - | (189) | (236) | 326 | 345 | 239 | 144 | 125 |
| 26 | 250 | 613 | 603 | 460 | - | 273 | -42 | 240 | 207 | 505 | 375 | 216 |
| 27 | 301 | 158 | 133 | 199 | -122 | 372 | 203 | 240 | - | - | 512 | 362 |
| 28 | 163 | 132 | 92 | 137 | 197 | 235 | 179 | 522 | 287 | 287 | 238 | 491 |
| 29 | 142 | 122 | 147 | 168 | 357 | 202 | 188 | 188 | 142 | 244 | 523 | 264 |
| 30 | 152 | 131 | 162 | 248 | 155 | 277 | - | - | 241 | 201 | 250 | 284 |
| 31 | 197 | 151 | 550 | 131 | - | 188 | -117 | 197 | - | - | - | - |
| (a) | 205 | 229 | 233 | 248 | 214 | 219 | 187 | 250 | 161 | 192 | 232 | 256 |
| (b) | 205 | 185 | 171 | 234 | 169 | 197 | 162 | 215 | 133 | 198 | 215 | 261 |
| Mean | (a) 229 (b) 199 | | | | (a) 217 (b) 186 | | | | (a) 210 (b) 202 | | | |

| | OCTOBER, factor 1.32 | | | | NOVEMBER, factor 1.55 | | | | DECEMBER, factor 1.44 | | | |
|------|------------------------|-------|---------|---------|-----------------------|-------|---------|---------|-----------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 148 | 198 | 222 | 188 | 135 | 128 | 61 | 88 | 73 | 31 | 166 | 104 |
| 2 | 139 | 198 | 233 | 109 | -35 | 145 | 131 | 352 | 52 | -187 | 125 | 114 |
| 3 | 130 | 155 | 140 | 165 | -42 | 184 | 169 | 275 | 114 | -21 | 10 | 104 |
| 4 | 126 | 91 | - | - | 188 | 159 | 123 | 173 | 104 | 125 | 115 | 157 |
| 5 | - | - | 76 | 218 | 147 | 155 | 133 | 140 | - | - | - | - |
| 6 | 148 | 235 | 219 | 255 | -377 | -753 | 226 | -602 | - | - | - | - |
| 7 | 102 | 138 | 214 | 229 | 177 | 361 | 177 | 131 | - | - | 140 | -194 |
| 8 | 195 | 231 | 251 | 405 | 78 | 157 | 204 | 86 | - | - | - | - |
| 9 | 324 | 221 | 283 | 160 | 144 | 144 | -304 | 104 | - | - | - | - |
| 10 | 155 | 78 | 0 | 83 | 32 | 81 | 97 | (73) | - | - | - | - |
| 11 | 104 | 156 | 280 | 363 | - | - | 74 | 131 | - | - | - | - |
| 12 | 292 | 287 | 355 | 261 | 75 | 109 | 117 | 167 | - | - | 127 | 116 |
| 13 | 246 | 261 | 314 | 361 | 84 | 84 | 84 | 101 | (176) | 129 | 363 | 445 |
| 14 | 347 | 358 | 431 | 326 | 85 | 119 | 94 | 128 | 427 | 463 | 238 | 119 |
| 15 | 385 | 184 | 158 | 116 | 86 | 86 | -370 | 181 | 0 | -481 | 180 | 120 |
| 16 | 137 | 624 | 227 | - | 217 | 244 | 235 | 339 | 97 | 122 | 414 | 365 |
| 17 | - | - | 159 | 159 | 176 | 290 | 150 | 519 | 123 | -37 | 321 | 419 |
| 18 | 69 | -11 | 143 | 261 | 436 | 445 | 205 | -1085 | 125 | 138 | 38 | 125 |
| 19 | 75 | 117 | 117 | 165 | -457 | 305 | 358 | (251) | 127 | 127 | 671 | 291 |
| 20 | 348 | - | - | - | - | - | 145 | 154 | -500 | -141 | 128 | 589 |
| 21 | - | - | 53 | 145 | 91 | 339 | 284 | 91 | 117 | 130 | -377 | 260 |
| 22 | 54 | 188 | 145 | 37 | 102 | -111 | -1282 | 258 | 250 | 460 | 709 | 1052 |
| 23 | - | - | 205 | 161 | 269 | -186 | 130 | 130 | 293 | 133 | 120 | (133) |
| 24 | 286 | - | -43 | -270 | 93 | 103 | 112 | -75 | -135 | 67 | 94 | 418 |
| 25 | 27 | 151 | - | 178 | 192 | 105 | 153 | 393 | 123 | 137 | 942 | 355 |
| 26 | 206 | 342 | 559 | 451 | 107 | 448 | -234 | 19 | 180 | 526 | 567 | 277 |
| 27 | 164 | - | 301 | 273 | 99 | (238) | - | - | 196 | 182 | 126 | 280 |
| 28 | 261 | 271 | 283 | - | 301 | - | 191 | 101 | 141 | 1131 | 141 | 141 |
| 29 | - | 179 | 168 | 375 | 41 | -205 | -21 | 41 | 157 | 286 | 129 | 200 |
| 30 | - | - | - | - | 10 | 62 | 72 | 453 | 419 | -231 | 275 | 14 |
| 31 | 86 | 145 | 112 | 172 | - | - | - | - | 441 | - | - | - |
| (a) | 182 | 219 | 217 | 225 | 140 | 195 | 155 | 188 | 178 | 262 | 267 | 269 |
| (b) | 178 | 193 | 232 | 228 | 79 | 115 | 42 | 105 | 121 | 140 | 250 | 276 |
| Mean | (a) 211 (b) 208 | | | | (a) 169 (b) 85 | | | | (a) 244 (b) 197 | | | |

The factor used for converting the potential at the collector potential gradient in volts per metre in the open is given for each month.

| | | | | | |
|--------------|-----|-----|-----|-----|-----|
| Annual means | (a) | 172 | 200 | 207 | 215 |
| | (b) | 151 | 163 | 166 | 198 |
| | (a) | 199 | | 169 | |

POTENTIAL GRADIENT (reduced to level surface):DIURNAL INEQUALITIES
The departures from the mean of the day are adjusted for non-cyclic change†

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| | Hour G.M.T. | | | | | | | | | | | | | | | | | | | | | | | | Non-cyclic change† | No. of days used | Mean |
|---------|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------|------------------|-------|
| | 0 to 1 | 1 to 2 | 2 to 3 | 3 to 4 | 4 to 5 | 5 to 6 | 6 to 7 | 7 to 8 | 8 to 9 | 9 to 10 | 10 to 11 | 11 to 12 | 12 to 13 | 13 to 14 | 14 to 15 | 15 to 16 | 16 to 17 | 17 to 18 | 18 to 19 | 19 to 20 | 20 to 21 | 21 to 22 | 22 to 23 | 23 to 24 | | | |
| | volts per metre | | | | | | | | | | | | | | | | | | | | | | | | | | v./m. |
| | 0a days only* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | -40 | -36 | -43 | -40 | -42 | -35 | -36 | -27 | -19 | -27 | -12 | -20 | +11 | +26 | +37 | +23 | +21 | +37 | +51 | +52 | +10 | +41 | +41 | +28 | -9 | 8 | 177 |
| Feb. | -127 | -139 | -154 | -139 | -125 | -111 | -117 | -123 | -88 | -64 | -15 | +23 | +37 | -31 | +63 | +89 | +200 | +185 | +131 | +135 | +101 | +72 | +101 | +95 | -109 | 2 | 201 |
| Mar. | -22 | -41 | -43 | -34 | -55 | -51 | -29 | -43 | -24 | -39 | +11 | +76 | +18 | +20 | +15 | +42 | +47 | +22 | -13 | +35 | +58 | +51 | +3 | -4 | -37 | 4 | 196 |
| Apr. | -7 | -20 | -5 | -1 | -13 | -16 | -21 | -19 | +12 | -41 | -26 | +23 | +19 | +47 | +72 | +63 | -3 | -33 | -9 | +24 | -16 | -39 | -11 | +20 | +61 | 2 | 165 |
| May | -15 | -19 | -21 | -25 | -20 | -9 | -22 | -14 | +5 | -5 | 0 | -7 | -8 | -4 | +21 | +15 | +26 | +6 | +13 | +49 | +12 | +11 | +12 | +1 | -5 | 15 | 168 |
| June | +11 | +8 | +20 | -11 | -30 | -34 | -23 | -32 | -33 | +12 | -16 | -6 | -5 | 0 | +43 | +66 | +42 | +3 | -28 | -4 | +1 | +3 | +11 | +3 | +51 | 9 | 219 |
| July | +19 | -11 | -12 | -1 | +18 | -13 | -6 | +21 | +27 | +2 | -6 | -19 | +2 | -10 | -24 | -24 | -19 | -13 | -26 | +2 | +20 | +34 | +24 | +16 | 0 | 9 | 181 |
| Aug. | +9 | +27 | +10 | +3 | -3 | +46 | +72 | +50 | -34 | -52 | -78 | -76 | -63 | -65 | -51 | -24 | -8 | +2 | +42 | +46 | +44 | +40 | +40 | +25 | -100 | 9 | 206 |
| Sept. | -71 | -76 | -89 | -75 | -34 | -23 | -25 | +12 | -53 | -69 | -55 | -48 | +13 | +33 | +34 | +94 | +57 | +51 | +82 | +108 | +84 | +50 | +22 | -23 | -49 | 7 | 236 |
| Oct. | -17 | -33 | -32 | -36 | -38 | -31 | -11 | 0 | -11 | -8 | -30 | -11 | +13 | +20 | +33 | +53 | +57 | +36 | +38 | +34 | +12 | -3 | -13 | -17 | +34 | 13 | 241 |
| Nov. | -6 | 0 | -23 | -31 | -36 | -49 | -40 | -33 | -6 | -7 | +1 | -2 | +51 | -4 | -18 | -15 | +12 | +71 | +81 | +67 | +27 | +13 | -27 | -25 | +24 | 4 | 148 |
| Dec. | +34 | -20 | +4 | -5 | -40 | -106 | -94 | -103 | -101 | -87 | -73 | -82 | -93 | -102 | +75 | +113 | +56 | 0 | +36 | +110 | +99 | +148 | +114 | +117 | +232 | 1 | 264 |
| Year | -19 | 30 | -33 | -33 | -35 | -36 | -29 | -26 | -27 | -32 | -25 | -12 | 0 | -6 | +25 | +41 | +41 | +31 | +33 | +55 | +38 | +35 | +26 | +20 | +8 | 83 | 200 |
| Winter | -35 | -49 | -54 | -54 | -61 | -75 | -72 | -71 | -53 | -46 | -25 | -20 | +1 | -28 | +39 | +53 | +72 | +73 | +75 | +91 | +59 | +69 | +57 | +54 | +35 | 15 | 197 |
| Equinox | -7 | -43 | -44 | -37 | -35 | -30 | -21 | -13 | -19 | -39 | -25 | +10 | +16 | +30 | +39 | +63 | +39 | +19 | +25 | +50 | +35 | +15 | 0 | -6 | +2 | 26 | 209 |
| Summer | +6 | +1 | -1 | -9 | -9 | -3 | +5 | +6 | -9 | -11 | -25 | -27 | -19 | -20 | -3 | +8 | +10 | -1 | 0 | +23 | +19 | +22 | +22 | +11 | -13 | 42 | 193 |
| | 1a and 2a days only | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | -23 | -33 | -57 | -43 | -39 | -38 | -61 | -46 | -36 | +15 | +10 | +32 | +32 | +25 | +33 | +11 | +5 | +61 | +48 | +65 | +53 | +11 | +3 | -27 | -65 | 2 | 205 |
| Feb. | -37 | -53 | -33 | -43 | -26 | -44 | -37 | -24 | -24 | -51 | -28 | -17 | -8 | +30 | -3 | +17 | +23 | +71 | +42 | +58 | +65 | +134 | +11 | -23 | +21 | 5 | 125 |
| Mar. | -13 | -7 | -148 | -135 | -19 | +9 | +50 | +8 | +5 | -96 | -155 | +9 | +56 | +79 | +91 | +68 | +25 | +67 | +51 | +70 | -49 | -1 | +27 | +10 | -72 | 2 | 117 |
| Apr. | 0 | +4 | +6 | +4 | +10 | -11 | -47 | +16 | +51 | -49 | -43 | +49 | -14 | +57 | +12 | -20 | +52 | +66 | -55 | -80 | -4 | +7 | -2 | -7 | -18 | 3 | 133 |
| May | +12 | +11 | +2 | -13 | +9 | +51 | +35 | -2 | -8 | -11 | -25 | -7 | -15 | -18 | -14 | -20 | -3 | +16 | +2 | -20 | -7 | +7 | -1 | +19 | -12 | 10 | 82 |
| June | -27 | -4 | -31 | -41 | 0 | -19 | +17 | +15 | -23 | +9 | -11 | -5 | 0 | +14 | +22 | +30 | +35 | +18 | -19 | -24 | +34 | +31 | +12 | -35 | -15 | 4 | 119 |
| July | +13 | -4 | -10 | -14 | -9 | -42 | -28 | -28 | -25 | +29 | 0 | -26 | -2 | -1 | -32 | +8 | -24 | -11 | +63 | +49 | +69 | +31 | +10 | -16 | +74 | 11 | 199 |
| Aug. | +12 | +5 | -5 | +17 | +7 | +5 | +14 | +32 | +11 | -14 | -11 | -13 | -4 | +14 | +4 | -7 | +1 | -10 | -11 | +25 | -14 | -53 | -6 | +1 | +31 | 1 | 104 |
| Sept. | +19 | -4 | +9 | +12 | +32 | +15 | +10 | +39 | +46 | +26 | -37 | -49 | -42 | -45 | -15 | -13 | -24 | 0 | +19 | +19 | +5 | -14 | -19 | +10 | +31 | 8 | 145 |
| Oct. | +95 | +55 | +47 | -53 | -43 | +53 | +21 | -19 | -37 | -15 | -69 | -101 | -52 | -25 | -33 | -71 | -43 | -21 | +14 | +45 | +43 | +47 | +77 | +87 | -222 | 2 | 135 |
| Nov. | -31 | -17 | -24 | -4 | -32 | -20 | -25 | -52 | -66 | -88 | -141 | -109 | -5 | +63 | +5 | +25 | +57 | +65 | +89 | +103 | +76 | +112 | +36 | -15 | -157 | 3 | 69 |
| Dec. | +38 | +13 | +6 | -31 | -45 | -61 | -59 | -25 | -13 | -27 | -96 | -29 | -1 | +81 | +85 | -12 | -83 | -151 | +129 | -10 | +39 | +6 | +97 | +148 | +169 | 2 | 162 |
| Year | +5 | -3 | -20 | -29 | -13 | -9 | -9 | -7 | -10 | -23 | -51 | -22 | -5 | +23 | +13 | +1 | +2 | +14 | +31 | +25 | +26 | +27 | +20 | +13 | -20 | 53 | 133 |
| Winter | -13 | -23 | -27 | -30 | -35 | -41 | -45 | -37 | -35 | -38 | -64 | -31 | +5 | +50 | +30 | +10 | +1 | +11 | +77 | +54 | +58 | +66 | +37 | +21 | -8 | 12 | 140 |
| Equinox | +25 | +12 | -21 | -43 | -5 | +17 | +9 | +11 | +16 | -33 | -76 | -23 | -13 | +17 | +14 | -9 | +3 | +28 | +7 | +13 | -1 | +10 | +21 | +25 | -70 | 15 | 133 |
| Summer | +3 | +2 | -11 | -13 | +2 | -1 | +9 | +4 | -11 | +3 | -12 | -13 | -5 | +2 | -5 | +3 | +2 | +3 | +9 | +7 | +21 | +4 | +4 | -7 | +19 | 26 | 126 |

Winter: January, February, November, December
Equinox: March, April, September, October
Summer: May to August

* For explanation of 0a, 1a, 2a days see p. 16, *Observatories' Year Book*, 1938

† See p. 10, *Observatories' Year Book*, 1938

ELECTRICAL CHARACTER OF EACH DAY AND APPROXIMATE DURATION OF NEGATIVE POTENTIAL GRADIENT

8 LERWICK

| | JANUARY | | FEBRUARY | | MARCH | | APRIL | | MAY | | JUNE | |
|------------------|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|
| | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient |
| 1 | (1b) | hr. 1.3 | (1b) | hr. - | (1b) | (0.2) | 2a | hr. 4.3 | (0a) | hr. ... | 1a | hr. 0.3 |
| 2 | (1b) | (0.4) | 1a | 1.0 | 0a | ... | (1a) | 0.1 | 0a | ... | 1a | 0.1 |
| 3 | - | - | (2c) | - | (0a) | ... | (2b) | (3.2) | 1a | 3.0 | 0a | ... |
| 4 | 1a | 0.1 | - | - | (0a) | ... | - | - | (2a) | (6.1) | (0a) | ... |
| 5 | (1b) | 0.9 | (1b) | 0.7 | (1b) | 0.3 | 2b | 4.2 | 0a | ... | (0a) | ... |
| 6 | - | - | - | - | (0a) | ... | 1b | 0.7 | (0a) | ... | (1a) | (0.3) |
| 7 | 1b | 1.6 | (2c) | (4.3) | 1b | 0.9 | 1b | 0.8 | 1c | 2.1 | 1a | 0.6 |
| 8 | (2c) | (5.7) | (1b) | 0.6 | 1a | 0.1 | 2c | 5.8 | (1b) | 0.6 | (0a) | ... |
| 9 | (1b) | 0.5 | 2b | 9.0 | 1b | 0.1 | 2b | 3.5 | 0a | ... | (1b) | 1.9 |
| 10 | (1b) | 2.3 | 1a | 1.9 | 1b | 1.0 | 1b | 0.5 | 1a | 0.1 | 2b | 6.9 |
| 11 | (2c) | (5.6) | 1a | 0.1 | (1b) | (1.1) | - | - | 0a | ... | 0a | ... |
| 12 | (2b) | - | 1a | 0.3 | (1b) | 0.6 | - | - | 1a | 1.0 | (1a) | - |
| 13 | (1b) | - | 0a | ... | 0a | ... | (1c) | 1.7 | 1a | 0.1 | (1a) | 0.1 |
| 14 | 0a | ... | 0a | ... | 2a | 5.3 | (2c) | - | 0a | ... | 1b | 0.7 |
| 15 | 1b | 0.4 | 1b | 0.6 | (1b) | (0.4) | 2b | 3.8 | 0a | ... | 0a | ... |
| 16 | (1b) | - | 2c | 4.4 | 0a | ... | (1b) | (1.5) | 1a | 1.1 | 0a | ... |
| 17 | - | - | 1b | 1.5 | (2b) | - | 1b | 0.6 | (0a) | ... | (2c) | 3.5 |
| 18 | 1b | 0.8 | 1b | 2.9 | 0a | ... | 1c | 2.9 | 0a | ... | 1b | 1.9 |
| 19 | - | - | (2c) | - | (1b) | (1.7) | (1a) | 0.1 | 0a | ... | 1a | 0.9 |
| 20 | (0a) | ... | - | - | (1b) | - | - | - | 0a | ... | 0a | ... |
| 21 | (0a) | ... | (2b) | - | 1b | 1.9 | 1a | 0.1 | 1a | 1.2 | 0a | ... |
| 22 | (1a) | - | - | - | 2b | 12.6 | 0a | ... | 1a | 2.8 | 1b | 0.2 |
| 23 | 0a | ... | (1b) | - | 2b | 7.0 | 1b | 1.1 | 2a | 9.2 | 0a | ... |
| 24 | (0a) | ... | (1b) | 2.3 | 1c | 1.7 | (1a) | 0.2 | (1a) | - | (0a) | ... |
| 25 | 0a | ... | - | - | - | - | 1b | 0.2 | (0a) | ... | (1b) | - |
| 26 | - | - | (1b) | - | 2c | 3.3 | (1b) | 0.9 | 0a | ... | (1a) | - |
| 27 | 0a | ... | (1b) | (1.3) | (1b) | - | (1b) | 0.3 | 1a | 0.3 | 0a | ... |
| 28 | 1a | 0.1 | 1a | 0.8 | 1b | 0.3 | 1b | 0.9 | 0a | ... | (0a) | ... |
| 29 | 0a | ... | - | - | 1b | 0.7 | 1b | 0.7 | (0a) | ... | (0a) | ... |
| 30 | 0a | ... | - | - | 1b | 1.5 | 0a | ... | (0a) | ... | (1a) | 0.1 |
| 31 | 2c | 7.2 | - | - | 1c | 1.2 | - | - | (0a) | ... | - | - |
| Total | 21 | 26.9 | 27 | 31.7 | 28 | 41.9 | 31 | 38.1 | 15 | 27.6 | 18 | 17.5 |
| No. of days used | 26 | 22 | 23 | 17 | 30 | 27 | 26 | 25 | 31 | 30 | 30 | 27 |
| Mean | 0.81 | 1.2 | 1.17 | 1.9 | 0.93 | 1.6 | 1.19 | 1.5 | 0.48 | 0.9 | 0.60 | 0.6 |

| | JULY | | AUGUST | | SEPTEMBER | | OCTOBER | | NOVEMBER | | DECEMBER | |
|------------------|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|
| | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient |
| 1 | (2a) | hr. (6.9) | 0a | hr. ... | 0a | hr. ... | 0a | hr. ... | 1a | hr. 0.6 | 1b | hr. 0.7 |
| 2 | 0a | ... | 1b | 0.2 | (1b) | 0.6 | 0a | ... | (1b) | (1.7) | 1b | 1.1 |
| 3 | 1a | 0.2 | (0a) | ... | 1a | 0.7 | 0a | ... | 2b | 3.4 | 1b | 2.3 |
| 4 | 0a | ... | - | - | 0a | ... | - | - | 1b | 0.2 | 1a | 0.7 |
| 5 | 0a | ... | - | - | 1a | 0.2 | (0a) | ... | 1a | 1.3 | - | - |
| 6 | 2b | 4.3 | 0a | ... | (0a) | ... | 0a | ... | 2b | 15.6 | - | - |
| 7 | 1b | 0.7 | 2c | 3.6 | (0a) | ... | 0a | ... | 1b | 0.9 | - | - |
| 8 | 1b | 0.4 | 1b | 1.2 | 0a | ... | 0a | ... | 1b | 1.7 | - | - |
| 9 | 1a | 0.1 | 0a | ... | (0a) | ... | 0a | ... | 2b | 4.0 | - | - |
| 10 | 2c | 3.1 | (0a) | ... | 1a | 0.5 | 2a | 3.7 | (1a) | - | - | - |
| 11 | (1b) | 0.4 | 1a | 0.3 | 1b | 0.3 | 0a | ... | (0a) | ... | - | - |
| 12 | - | - | 0a | ... | (0a) | ... | 0a | ... | 0a | ... | (0a) | ... |
| 13 | 1a | 0.1 | (2b) | 3.2 | - | - | 0a | ... | 0a | ... | (0a) | ... |
| 14 | 0a | ... | 2b | 3.2 | 1b | 0.9 | 0a | ... | 0a | ... | 1b | 0.3 |
| 15 | 1b | 2.8 | (1a) | 1.0 | 1a | 1.0 | 1a | 0.6 | 2c | 7.8 | 1b | 1.4 |
| 16 | 1a | 0.3 | (0a) | ... | 1b | 1.8 | (2b) | - | 0a | ... | 1a | 0.3 |
| 17 | 1a | 0.1 | 0a | ... | 1a | 2.9 | (0b) | ... | 1b | 1.5 | 1b | 2.4 |
| 18 | 0a | ... | (1b) | (2.9) | (1b) | 1.6 | (1a) | 0.6 | 2c | 7.5 | 1b | 0.1 |
| 19 | 1a | 0.1 | 1b | 1.5 | (1a) | 1.3 | (2b) | - | (2b) | 6.1 | 1b | 1.5 |
| 20 | (0a) | ... | 0a | ... | (0a) | ... | - | - | (1a) | 0.7 | 2b | 8.7 |
| 21 | 0a | ... | 1b | 2.5 | 1a | 0.9 | (1b) | - | 2b | 3.7 | 2b | 5.0 |
| 22 | 1a | 0.1 | (1b) | - | 0a | ... | 1b | 1.1 | 2c | 3.7 | 1c | 2.6 |
| 23 | 1b | 2.9 | (0a) | ... | 1b | 1.5 | - | - | 1b | 1.2 | (1c) | 2.9 |
| 24 | (0a) | ... | - | - | 1b | 1.5 | (2b) | 4.5 | 1b | 0.5 | 1b | 3.0 |
| 25 | 1a | 0.5 | (0a) | ... | 1a | 0.2 | (1a) | 1.8 | 1c | 1.2 | 1c | 1.9 |
| 26 | 1b | 1.1 | (1b) | 2.4 | 1a | 0.1 | 0a | ... | 2b | 8.3 | 1b | 0.7 |
| 27 | 1a | 0.3 | 1b | 2.3 | (1b) | 1.4 | (0a) | ... | (1c) | 2.2 | 1b | 0.9 |
| 28 | 1b | 1.3 | 0a | ... | 0a | ... | (0a) | ... | (1c) | (2.9) | 1b | 2.3 |
| 29 | 1a | 0.1 | (1b) | (1.4) | 0a | ... | (0a) | ... | 2a | 6.7 | 1b | 0.3 |
| 30 | 0a | ... | - | - | 0a | ... | (0a) | ... | 1b | 0.9 | 2c | 6.3 |
| 31 | 1b | 2.4 | - | - | - | - | 0a | ... | - | - | (2c) | - |
| Total | 24 | 28.2 | 17 | 25.7 | 17 | 17.4 | 13 | 12.3 | 35 | 84.3 | 26 | 45.4 |
| No. of days used | 30 | 30 | 26 | 25 | 29 | 29 | 28 | 25 | 30 | 29 | 24 | 23 |
| Mean | 0.80 | 0.9 | 0.65 | 1.0 | 0.59 | 0.6 | 0.46 | 0.5 | 1.17 | 2.9 | 1.08 | 2.0 |

Annual values: Character frequency 0 1 2
No. of days used 111 172 50

Mean character figure 0.82 (333 days)

Duration: Total 397.0 hr.
No. of days 309
Mean 1.28 hr.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 26 columns (Hour G.M.T. 0-1 to 23-24, Mean) and 31 rows (1 to 31). Title: 17 LERWICK (H) 14,000y (0.14 C.G.S. unit) + MARCH 1951

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 26 columns (Hour G.M.T. 0-1 to 23-24, Mean) and 31 rows (1 to 31). Title: 18 LERWICK (D) 10° + MARCH 1951

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 24 columns (Hour G.M.T. 0-1 to 23-24) and 25 rows (1 q to Mean). Title: 21 LERWICK (H) 14,000γ (0.14 C.G.S. unit) + APRIL 1951

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 24 columns (Hour G.M.T. 0-1 to 23-24) and 25 rows (1 q to Mean). Title: 22 LERWICK (D) 10° + APRIL 1951

Table for station 23 LERWICK (Z) showing magnetic force values for April 1951. The table is organized into a grid with columns for time of day (Hour G.M.T. 0-1 to 23-24) and a 'Mean' column. Values are given in units of 46,000γ (0.46 C.G.S. unit). The data is presented in two main sections, with the second section starting at hour 21. Each entry consists of a letter (q for quiet, d for disturbed) and a series of numbers representing the magnetic force at each hour.

DAILY EXTREMES OF TERRESTRIAL MAGNETIC ELEMENTS, MAGNETIC CHARACTER FIGURES AND TEMPERATURE IN MAGNET HOUSE

Table for station 24 LERWICK showing daily extremes of magnetic elements, magnetic character figures, and temperature in magnet house for April 1951. The table is organized into columns for Horizontal force (Maximum, Minimum, Range), Declination (Maximum, Minimum, Range), Vertical force (Maximum, Minimum, Range), 3-hr. range indices K, Sum of K indices, Magnetic character of day (0-2), and Temperature in magnet house (200+). Each row represents a day, with entries for 'q' (quiet) and 'd' (disturbed) days. Values are given in units of 14,000γ+ and 46,000γ+.

q denotes an international quiet day and d an international disturbed day.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 rows (LERWICK (H)) and 25 columns (Hour G.M.T.). Values range from 356 to 449. Includes a 'Mean' row at the bottom.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 rows (LERWICK (D)) and 25 columns (Hour G.M.T.). Values range from 27.2 to 44.4. Includes a 'Mean' row at the bottom.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns: 29 LERWICK (H), Hour G.M.T., 0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, Mean. Rows 1-30 and Mean row.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns: 30 LERWICK (D), Hour G.M.T., 0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, Mean. Rows 1-30 and Mean row.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table for 41 LERWICK (H) showing magnetic force data for 14,000γ (0.14 C.G.S. unit) + in September 1951. Columns include Hour G.M.T. (0-1 to 23-24) and Mean. Rows are labeled 1 q through 30 q.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table for 42 LERWICK (D) showing magnetic declination data for 10° + in September 1951. Columns include Hour G.M.T. (0-1 to 23-24) and Mean. Rows are labeled 1 q through 30 q.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table for 45 LERWICK (H) showing magnetic force data for October 1951. Columns include Hour G.M.T. (0-1 to 23-24) and Mean. Values are in units of 14,000γ (0.14 C.G.S. unit) +.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table for 46 LERWICK (D) showing magnetic declination data for October 1951. Columns include Hour G.M.T. (0-1 to 23-24) and Mean. Values are in units of 10° +.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 26 rows (1 to Mean). Includes sub-headers for '53 LERWICK (H)' and '14,000γ (0.14 C.G.S. unit) +'. Data values range from 355 to 422.

405 at 0-1h. January 1, 1952.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 32 rows (1 to Mean). Includes sub-headers for '54 LERWICK (D)' and '10° +'. Data values range from 26.7 to 38.9.

38.9 at 0-1h. January 1, 1952.

INTERNATIONAL QUIET DAYS

Departures from the mean of the 24 hourly values (uncorrected for non-cyclic change)

58 LERWICK

Table with columns for Hour G.M.T. (0-1 to 23-24) and rows for months (Jan to Dec), seasons (Year, Winter, Equinox, Summer), and magnetic force types (Horizontal Force, Declination, Vertical Force). Each cell contains numerical values representing magnetic deviations.

DIURNAL INEQUALITIES OF THE TERRESTRIAL MAGNETIC ELEMENTS

INTERNATIONAL DISTURBED DAYS

Departures from the mean of the 24 hourly values (uncorrected for non-cyclic change)

59 LERWICK

| | Hour G.M.T. | | | | | | | | | | | | HORIZONTAL FORCE | | | | | | | | | | | | DECLINATION | | | | | | | | | | | | VERTICAL FORCE | | | | | | | | | | | |
|---------|------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|------------------|-------|--------|--------|--------|--------|--------|-------|-------|--------|--------|--------|-------------|--------|--------|--------|--------|-------|-------|-------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|-------|-------|--------|--------|--------|
| | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 |
| | HORIZONTAL FORCE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DECLINATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | VERTICAL FORCE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | -5.8 | -18.7 | -4.4 | +3.5 | -0.3 | -5.4 | -21.7 | -19.3 | -12.2 | -19.9 | -19.4 | -2.7 | +3.8 | +12.3 | +15.2 | +21.1 | +36.1 | +18.8 | +18.1 | +26.1 | +1.0 | -0.9 | -16.0 | -9.3 | +5.37 | +6.01 | +5.66 | +3.17 | +3.87 | +0.43 | +0.99 | -1.37 | -7.18 | -13.13 | -7.09 | -4.37 | +7.1 | +19.0 | +39.1 | +51.5 | +69.1 | +75.6 | +76.1 | +59.1 | +42.7 | +5.4 | -18.7 | -24.3 |
| Feb. | -29.2 | -65.4 | -103.8 | -38.2 | -37.6 | -1.9 | +5.2 | +1.4 | -1.2 | -4.2 | -5.6 | -4.8 | +5.6 | +22.4 | +47.4 | +46.2 | +42.8 | +34.7 | +31.0 | +34.8 | +14.4 | +15.0 | +0.8 | -9.8 | +5.32 | +6.87 | +8.76 | +4.10 | +3.90 | -3.23 | -1.48 | -3.46 | -4.90 | -0.41 | -4.16 | -1.72 | +37.5 | +56.1 | +67.7 | +80.9 | +84.3 | +91.6 | +62.1 | +35.7 | -2.7 | -14.5 | -27.7 | -52.1 |
| Mar. | -38.9 | -3.6 | -0.6 | -15.9 | -26.2 | -2.0 | +11.3 | +5.2 | +9.0 | +6.3 | -3.0 | -12.0 | +0.9 | +21.6 | +45.0 | +64.5 | +92.8 | +147.6 | +80.1 | -10.8 | -62.2 | -101.5 | -52.4 | -155.2 | +8.83 | +9.97 | +11.73 | +11.15 | +7.75 | +7.17 | -1.37 | -2.41 | -5.01 | -8.35 | -11.11 | -9.67 | +23.8 | +42.8 | +60.6 | +81.0 | +120.4 | +135.0 | +117.2 | +55.8 | -54.2 | -68.0 | -85.4 | -90.6 |
| Apr. | -56.2 | -50.0 | -27.7 | -16.4 | -22.8 | -4.2 | -3.6 | -3.4 | -3.3 | -16.4 | -16.2 | -15.8 | -29.2 | +14.8 | +26.7 | +57.2 | +100.2 | +76.8 | +47.0 | +30.4 | +5.3 | +2.0 | -10.6 | -84.6 | +43.4 | +61.9 | +70.2 | +68.2 | +107.4 | +98.5 | +70.6 | +53.4 | -5.0 | -26.9 | -49.0 | -108.0 | +0.8 | +6.4 | +32.4 | +40.6 | +64.8 | +76.1 | +57.6 | +50.4 | +33.0 | -2.8 | -75.2 | -46.2 |
| May | -96.2 | -28.1 | +17.7 | +19.8 | +19.5 | +9.5 | -18.0 | -11.1 | -23.5 | -24.6 | -8.9 | -2.5 | -2.2 | +36.5 | +46.7 | +75.6 | +102.1 | +125.5 | +105.4 | +68.9 | +43.5 | -71.6 | -158.7 | -225.3 | +6.6 | +13.1 | +24.8 | +58.9 | +61.0 | +54.7 | +48.2 | +43.1 | +31.2 | +0.9 | -28.4 | -30.3 | +19.8 | +36.2 | +54.8 | +81.6 | +86.4 | +76.2 | +75.8 | +65.6 | +40.8 | +14.2 | -8.0 | -53.6 |
| June | -97.0 | -87.5 | -70.2 | -68.5 | -34.3 | -6.0 | -25.3 | -27.5 | -20.2 | -16.5 | -17.4 | -11.7 | -8.8 | +8.9 | +46.8 | +84.7 | +100.1 | +79.4 | +87.9 | +71.7 | +58.8 | +37.3 | +0.4 | -85.1 | +6.6 | +13.1 | +24.8 | +58.9 | +61.0 | +54.7 | +48.2 | +43.1 | +31.2 | +0.9 | -28.4 | -30.3 | +31.4 | +45.3 | +99.8 | +109.8 | +139.3 | +139.7 | +28.5 | -23.1 | -58.6 | -24.5 | -29.1 | -76.3 |
| July | -211.2 | -176.9 | -125.6 | -154.7 | -111.2 | -86.7 | -49.4 | -7.5 | +18.8 | -6.3 | -15.2 | -2.7 | +13.2 | +51.7 | +82.8 | +162.1 | +158.0 | +141.3 | +108.2 | +86.9 | +61.0 | +33.9 | +19.2 | +10.3 | +8.14 | +7.33 | +7.62 | +7.87 | +6.30 | +9.09 | +6.68 | +3.31 | +1.82 | -0.05 | -0.38 | -0.71 | +42.0 | +93.9 | +220.8 | +301.5 | +204.2 | +147.1 | +71.8 | -11.3 | -3.8 | -130.7 | -164.0 | -305.7 |
| Aug. | -19.2 | -94.0 | -38.9 | -16.6 | -52.2 | -17.2 | -25.4 | -19.2 | -35.5 | -39.8 | -40.6 | -34.0 | -21.6 | -2.8 | +36.9 | +84.6 | +126.4 | +121.4 | +94.0 | +69.2 | +17.9 | -29.8 | -11.0 | -52.6 | +7.92 | +8.29 | +6.73 | +5.82 | +7.67 | +2.33 | +2.00 | -1.23 | -2.57 | -0.12 | -3.87 | +0.25 | +42.0 | +93.9 | +220.8 | +301.5 | +204.2 | +147.1 | +71.8 | -11.3 | -3.8 | -130.7 | -164.0 | -305.7 |
| Sept. | -139.4 | -80.7 | -26.8 | -16.5 | -58.2 | -62.7 | -5.6 | +2.5 | -26.0 | -45.7 | -19.2 | +12.5 | +42.0 | +93.9 | +220.8 | +301.5 | +204.2 | +147.1 | +71.8 | -11.3 | -3.8 | -130.7 | -164.0 | -305.7 | +2.25 | +1.25 | -0.16 | +5.51 | +0.81 | +5.75 | -3.03 | -4.31 | +0.08 | -3.17 | -0.01 | -9.89 | +90.2 | +11.85 | +10.15 | +11.74 | +7.19 | +3.21 | +3.98 | -2.15 | -6.21 | -6.50 | -9.15 | -5.99 |
| Oct. | -81.5 | -86.7 | -55.0 | -58.5 | -31.5 | -16.9 | -6.9 | -12.3 | -35.6 | -24.5 | -2.7 | -1.5 | +6.7 | +25.1 | +103.8 | +182.1 | +139.3 | +139.7 | +28.5 | -23.1 | -58.6 | -24.5 | -29.1 | -76.3 | +9.21 | +10.96 | +9.41 | +9.88 | +10.86 | +6.83 | +9.04 | +6.24 | +2.57 | -6.64 | -10.63 | -15.06 | +5.56 | +7.23 | +6.21 | +4.72 | +6.63 | +6.65 | +10.16 | -0.07 | -7.33 | -7.22 | -4.85 | -9.03 |
| Nov. | -56.9 | -49.4 | -9.6 | +17.1 | +26.2 | +23.8 | +28.3 | +21.8 | +16.6 | -5.9 | -1.4 | +7.2 | +7.9 | +6.2 | +11.4 | +37.3 | +66.2 | +69.0 | +49.1 | +4.4 | -37.2 | -77.1 | -81.2 | -73.8 | +6.88 | +7.05 | +6.62 | +7.10 | +4.30 | +0.41 | +1.94 | -1.76 | -11.04 | -9.23 | -9.28 | -7.92 | +60.8 | +65.3 | +99.8 | +111.5 | +38.3 | +30.6 | +10.9 | +39.3 | +22.0 | -22.7 | -33.6 | -90.9 |
| Dec. | +3.8 | -15.1 | -9.7 | -6.6 | -30.9 | -15.3 | -29.4 | -6.1 | -10.9 | -10.0 | -18.9 | -0.3 | +4.8 | +27.7 | +30.7 | +20.8 | +12.1 | +56.9 | +27.2 | +29.7 | -0.5 | -16.0 | -23.5 | -20.5 | +4.78 | +8.17 | +5.86 | +6.62 | +2.18 | +0.57 | -7.96 | -5.48 | -11.46 | -9.05 | -5.14 | -2.30 | +25.7 | +42.8 | +57.7 | +70.1 | +87.3 | +74.8 | +56.1 | +43.7 | +3.1 | -51.2 | -52.1 | -118.5 |
| Year | -69.0 | -63.0 | -37.9 | -29.3 | -30.0 | -15.4 | -11.7 | -6.3 | -10.3 | -17.3 | -14.0 | -5.7 | +1.9 | +26.5 | +59.5 | +94.8 | +98.4 | +96.5 | +62.4 | +31.4 | +3.3 | -30.3 | -43.8 | -90.7 | +6.67 | +7.76 | +7.27 | +7.11 | +5.59 | +3.55 | +2.04 | -0.78 | -4.14 | -5.25 | -5.37 | -5.39 | +32.3 | +47.0 | +65.1 | +76.8 | +85.5 | +82.4 | +65.7 | +45.5 | +13.2 | -25.5 | -45.9 | -75.0 |
| Winter | -22.0 | -37.1 | -31.9 | -6.1 | -10.7 | +0.3 | -4.4 | -0.5 | -1.9 | -10.0 | -11.3 | -0.1 | +5.5 | +17.1 | +26.2 | +31.3 | +39.3 | +44.9 | +31.3 | +23.7 | -5.6 | -19.7 | -30.0 | -28.3 | +5.59 | +7.03 | +6.73 | +5.25 | +3.56 | -0.45 | -1.63 | -3.02 | -8.65 | -7.95 | -6.42 | -4.08 | +31.4 | +45.3 | +99.8 | +101.7 | +134.1 | +127.8 | +56.9 | -3.7 | -29.8 | -63.7 | -64.0 | -155.5 |
| Equinox | -79.0 | -55.3 | -27.5 | -26.8 | -34.7 | -21.5 | -1.2 | -2.0 | -14.0 | -20.1 | -10.3 | -4.2 | +5.1 | +38.9 | +99.1 | +151.3 | +134.1 | +127.8 | +56.9 | -3.7 | -29.8 | -63.7 | -64.0 | -155.5 | +6.41 | +7.57 | +6.98 | +8.28 | +5.59 | +5.69 | +2.43 | -2.23 | -4.62 | -6.31 | -6.28 | -8.65 | +4.9 | +23.6 | +53.3 | +101.7 | +121.7 | +116.9 | +98.9 | +74.2 | +45.3 | -7.5 | -37.5 | -88.2 |
| Summer | -105.9 | -96.6 | -54.3 | -55.0 | -44.5 | -25.1 | -29.5 | -16.3 | -15.1 | -21.8 | -20.5 | -12.7 | -4.9 | +23.6 | +53.3 | +101.7 | +121.7 | +116.9 | +98.9 | +74.2 | +45.3 | -7.5 | -37.5 | -88.2 | +7.99 | +8.68 | +8.10 | +7.79 | +7.61 | +5.41 | +5.31 | +2.91 | +0.84 | -1.54 | -3.41 | -3.46 | | | | | | | | | | | | |

The ranges are derived from the diurnal inequalities printed in Tables 57 to 59

Arithmetical averages of diurnal inequalities in Tables 57 to 59 taken regardless of sign

60 LERWICK

| | All days | | | Quiet days | | | Disturbed days | | |
|---------|----------|-------|----------|------------|-------|----------|----------------|-------|----------|
| | H | D | Z | H | D | Z | H | D | Z |
| | γ | | γ | γ | | γ | γ | | γ |
| Jan. | 22.4 | 9.42 | 50.2 | 12.3 | 5.35 | 9.2 | 57.8 | 19.14 | 133.2 |
| Feb. | 48.7 | 9.63 | 77.3 | 14.7 | 4.47 | 8.4 | 151.2 | 17.00 | 212.5 |
| Mar. | 68.9 | 12.72 | 86.4 | 33.6 | 7.26 | 24.6 | 302.8 | 22.84 | 225.6 |
| Apr. | 108.7 | 14.61 | 133.4 | 52.0 | 11.88 | 30.2 | 184.8 | 21.00 | 215.4 |
| May | 93.4 | 14.80 | 74.8 | 73.7 | 17.20 | 35.7 | 350.6 | 26.02 | 151.3 |
| June | 77.8 | 13.72 | 55.4 | 68.5 | 16.31 | 28.6 | 197.1 | 17.96 | 126.4 |
| July | 99.6 | 13.00 | 76.7 | 68.9 | 12.82 | 38.7 | 373.3 | 24.00 | 171.2 |
| Aug. | 85.9 | 12.36 | 95.8 | 61.2 | 13.60 | 26.8 | 220.4 | 19.32 | 217.4 |
| Sept. | 168.7 | 13.89 | 134.0 | 49.8 | 13.79 | 34.2 | 607.2 | 18.60 | 279.6 |
| Oct. | 67.4 | 12.11 | 81.3 | 35.5 | 6.89 | 8.0 | 268.8 | 19.19 | 235.4 |
| Nov. | 42.2 | 11.05 | 69.6 | 17.9 | 7.22 | 13.3 | 150.2 | 18.14 | 205.8 |
| Dec. | 25.6 | 10.58 | 59.7 | 12.6 | 4.90 | 15.2 | 87.8 | 19.63 | 204.0 |
| Year | 65.7 | 10.33 | 79.6 | 39.6 | 9.24 | 14.1 | 189.1 | 14.10 | 164.6 |
| Winter | 29.7 | 9.52 | 61.0 | 13.7 | 5.23 | 10.3 | 82.0 | 15.68 | 159.6 |
| Equinox | 95.1 | 12.16 | 104.3 | 40.2 | 9.75 | 17.4 | 306.8 | 16.93 | 201.2 |
| Summer | 84.0 | 13.34 | 75.3 | 68.0 | 14.73 | 25.6 | 227.6 | 17.97 | 151.2 |

61 LERWICK

| | All days | | | Quiet days | | | Disturbed days | | |
|---------|----------|------|----------|------------|------|----------|----------------|------|----------|
| | H | D | Z | H | D | Z | H | D | Z |
| | γ | | γ | γ | | γ | γ | | γ |
| Jan. | 4.8 | 2.26 | 13.8 | 3.3 | 1.07 | 2.4 | 13.0 | 4.12 | 37.1 |
| Feb. | 9.3 | 2.51 | 21.0 | 3.6 | 1.27 | 1.9 | 25.1 | 3.53 | 46.0 |
| Mar. | 12.8 | 3.29 | 21.9 | 5.9 | 1.76 | 4.5 | 40.4 | 5.38 | 54.8 |
| Apr. | 24.7 | 4.35 | 34.2 | 13.1 | 2.87 | 6.4 | 30.0 | 5.21 | 51.5 |
| May | 22.7 | 4.38 | 17.2 | 16.7 | 3.99 | 8.6 | 55.9 | 7.17 | 30.1 |
| June | 23.1 | 4.00 | 13.6 | 16.5 | 4.26 | 5.2 | 48.0 | 4.64 | 30.7 |
| July | 29.0 | 4.06 | 19.8 | 15.3 | 3.72 | 7.0 | 78.9 | 5.55 | 48.7 |
| Aug. | 22.1 | 3.29 | 23.9 | 15.3 | 3.61 | 5.8 | 45.9 | 3.29 | 57.1 |
| Sept. | 36.0 | 3.47 | 37.6 | 12.8 | 3.39 | 5.6 | 91.4 | 3.32 | 79.1 |
| Oct. | 15.4 | 3.09 | 22.2 | 8.2 | 1.98 | 1.7 | 52.1 | 4.91 | 55.7 |
| Nov. | 8.9 | 3.11 | 18.2 | 5.0 | 1.65 | 2.7 | 32.7 | 4.47 | 43.1 |
| Dec. | 6.0 | 2.38 | 17.5 | 3.4 | 1.06 | 2.5 | 17.8 | 4.03 | 49.6 |
| Year | 16.6 | 3.15 | 21.0 | 9.2 | 2.43 | 3.4 | 39.6 | 3.94 | 46.8 |
| Winter | 6.8 | 2.47 | 17.3 | 3.6 | 1.25 | 2.1 | 18.3 | 3.89 | 42.9 |
| Equinox | 21.6 | 3.53 | 29.8 | 9.6 | 2.43 | 3.9 | 51.1 | 4.37 | 58.8 |
| Summer | 23.8 | 3.89 | 18.3 | 15.8 | 3.83 | 6.3 | 53.0 | 5.15 | 40.2 |

NON-CYCLIC CHANGE

62 LERWICK

| | All days | | | Quiet days | | | Disturbed days | | |
|---------|----------|-------|----------|------------|-------|----------|----------------|-------|----------|
| | H | D | Z | H | D | Z | H | D | Z |
| | γ | | γ | γ | | γ | γ | | γ |
| Jan. | -1.2 | -0.22 | -0.6 | +1.3 | +0.26 | -0.7 | -10.4 | -2.09 | -13.6 |
| Feb. | +1.3 | +0.15 | -0.7 | +7.0 | +0.96 | +2.1 | -1.8 | -0.17 | -2.1 |
| Mar. | +0.5 | +0.09 | +1.0 | +8.6 | -0.41 | -14.2 | -33.6 | -2.75 | -4.3 |
| Apr. | +0.5 | 0.00 | -0.1 | -3.3 | -2.05 | -10.7 | -61.6 | +3.77 | -64.6 |
| May | +0.1 | -0.03 | +0.5 | +6.6 | -0.17 | +3.2 | -94.1 | +0.08 | -28.8 |
| June | -0.9 | -0.09 | -0.3 | -2.9 | -0.60 | -4.7 | -5.2 | -0.70 | -2.3 |
| July | -1.1 | -0.17 | -3.2 | +1.3 | -0.19 | +4.7 | +164.3 | +4.00 | -2.1 |
| Aug. | +1.5 | +0.11 | +2.6 | +6.2 | -0.94 | +8.4 | -66.3 | +2.17 | -50.5 |
| Sept. | +0.3 | -0.02 | +1.3 | +13.0 | +0.94 | +16.3 | -204.2 | -9.96 | -53.3 |
| Oct. | -0.3 | +0.14 | +0.2 | +8.7 | +0.87 | -3.3 | -30.8 | -2.15 | -28.6 |
| Nov. | -0.1 | -1.13 | +0.3 | +2.8 | -0.52 | -0.2 | -24.3 | -5.04 | -34.7 |
| Dec. | -0.4 | +0.5 | -1.1 | +4.1 | +0.32 | -0.3 | -19.1 | +2.22 | -13.0 |
| Year | 0.0 | -0.09 | 0.0 | +4.5 | +0.13 | +0.1 | -32.3 | -0.89 | -24.8 |
| Winter | -0.1 | -0.29 | -0.5 | +3.8 | +0.25 | +0.2 | +13.9 | -1.27 | -15.9 |
| Equinox | +0.3 | +0.05 | +0.6 | +6.7 | -0.16 | -3.0 | -82.5 | -2.77 | -37.7 |
| Summer | -0.1 | -0.05 | -0.1 | +2.8 | -0.47 | +2.9 | -0.3 | +1.39 | -20.9 |

"Winter" comprises the four months January, February, November, December; "Equinox" the months March, April, September, October; and "Summer" May to August.

MEAN MONTHLY AND ANNUAL VALUES OF TERRESTRIAL MAGNETIC ELEMENTS
For all, a, quiet, q, and disturbed, d, days for H, D and Z and for all days for N, W, I and F

63 LERWICK

| | Horizontal force | | | Declination (west) | | | Vertical force | | | North component all days | West component all days | Inclination (north) all days | Total force all days |
|-------|-------------------|----------|----------|--------------------|------|------|-------------------|----------|----------|--------------------------|-------------------------|------------------------------|----------------------|
| | a | q | d | a | q | d | a | q | d | | | | |
| | 14,000 γ + | | | 10 $^{\circ}$ + | | | 46,000 γ + | | | | | | |
| | γ | γ | γ | | | | γ | γ | γ | γ | | γ | |
| Jan. | 397 | 401 | 389 | 41.4 | 42.0 | 40.6 | 1048 | 1044 | 1046 | 14147 | 2670 | 72 59.2 | 49202 |
| Feb. | 391 | 398 | 383 | 40.1 | 41.1 | 39.5 | 1045 | 1051 | 1030 | 14142 | 2664 | 72 59.5 | 49197 |
| Mar. | 393 | 401 | 385 | 40.0 | 40.9 | 35.5 | 1046 | 1049 | 1038 | 14144 | 2664 | 72 59.4 | 49197 |
| Apr. | 390 | 402 | 387 | 39.1 | 39.4 | 39.5 | 1045 | 1054 | 1040 | 14142 | 2660 | 72 59.6 | 49196 |
| May | 396 | 405 | 385 | 38.2 | 38.8 | 38.2 | 1059 | 1061 | 1069 | 14149 | 2657 | 72 59.4 | 49211 |
| June | 407 | 412 | 389 | 38.4 | 38.5 | 38.0 | 1061 | 1066 | 1064 | 14160 | 2660 | 72 58.7 | 49217 |
| July | 403 | 408 | 377 | 37.2 | 37.2 | 35.9 | 1062 | 1063 | 1057 | 14157 | 2654 | 72 58.8 | 49217 |
| Aug. | 404 | 407 | 404 | 37.0 | 37.0 | 36.9 | 1064 | 1067 | 1053 | 14158 | 2654 | 72 59.0 | 49219 |
| Sept. | 385 | 402 | 359 | 35.5 | 36.4 | 36.1 | 1065 | 1068 | 1054 | 14140 | 2644 | 73 0.3 | 49214 |
| Oct. | 395 | 406 | 389 | 35.2 | 35.5 | 35.6 | 1075 | 1081 | 1057 | 14150 | 2645 | 72 59.8 | 49227 |
| Nov. | 401 | 407 | 381 | 34.1 | 34.5 | 32.5 | 1080 | 1083 | 1070 | 14157 | 2641 | 72 59.5 | 49233 |
| Dec. | 406 | 411 | 399 | 33.7 | 34.3 | 32.8 | 1084 | 1083 | 1087 | 14162 | 2641 | 72 59.3 | 49239 |
| Year | 397 | 405 | 386 | 37.5 | 38.0 | 36.8 | 1061 | 1064 | 1055 | 14151 | 2655 | 72 59.4 | 49214 |

64 LERWICK (contd.)

| Night commencing | | Night commencing | | Night commencing | |
|------------------|--|------------------|---|------------------|--|
| | NOVEMBER (contd.) | | DECEMBER (contd.) | | DECEMBER (contd.) |
| 20 b | Φ Fair. Moonlight. Faint glow 20h.45m. to 22h.30m. Moderate rayed band 22h. | 2 ca | Φ Fair. Faint glow 20h.30m. Moderate rayed arc at 01h. and 02h. | 22 c | Φ Fair becoming cloudy. Moderate rayed band 20h.45m., very active. No longer visible 21h.30m. but aurora again observed 02h. |
| 21 c | .. Cloudy | 3 ca | .. Cloudy | | |
| 22 b | Φ Fine. Moonlight. Diffuse surface first seen 18h.20m. and persisted to 22h. Mostly obscured by cloud. | 5 cb | Φ Cloudy. Moonlight. Faint glow 21h.20m. mostly obscured by cloud. | 24 a | .. Fine |
| 23 a | Φ Fair. Moderate pulsating surface 20h.30m. Moderate diffuse surface with faint rays 22h.45m. | 7 c | .. Cloudy | 25 a | .. Fair |
| 24 a | .. Fine to fair | 9 cb | .. Cloudy moonlight | 26 a | .. Fine |
| 27 c | .. Cloudy | 10 b | .. Fair. Moonlight | 27 c | .. Fine becoming cloudy |
| 30 ca | .. Fair | 13 a | .. Fine | 28 c-ca | Φ Overcast to 23h. Faint rays 24h. |
| | | 15 cb | Φ Cloudy. Moonlight. Moderate rayed arc 19h.33m. and moderate rayed band 21h.15m. | 29 ca | .. Variable cloud |
| | | 18 a | Φ Fine. Moderate homogeneous arc 21h.45m. fading to faint glow 22h.15m. | 31 a | Φ Fair. Faint homogeneous arc 18h.20m. changing to rayed arc by 18h.40m. and reverting to homogeneous arc by 19h. Brilliant rayed arc 20h.15m. fading to moderate rayed band 20h.25m. and deteriorating to faint glow 20h.45m. |
| | DECEMBER | 19 ca | .. Fair becoming cloudy | | |
| 1 ca | .. Fair to cloudy | 20 ca | .. Fair | | |

In the interests of brevity there have been omitted from Table 64 all dates on which the sky throughout the evening remained completely overcast and on which, therefore, no opportunity arose of determining whether or not aurora occurred. The nights on which aurora was actually seen are indicated by the symbol Φ. The nights on which aurora was not seen, despite at least an occasional interval of more or less clear sky, are indicated by the symbol ..; in the latter case also, remarks on the weather are added to assist the reader in judging how far the fact of no observation of aurora may be taken as indicating that there was not actual aurora.

The letters a, b, c, have the following significance:-

- a = Conditions favourable for seeing aurora
 - b = Unfavourable for faint aurora (moonlight, mist, Cs, etc.) but not such as to mask bright aurora
 - c = Cloudy, but aurora not seen in clear intervals
 - ca, cb = Have been used for "Cloudy, with conditions a or b in the intervals"
- Changing conditions have been indicated by a hyphen, e.g., a-c

65 OTHER SCOTTISH STATIONS

| Night com-mencing | | Night com-mencing | | Night com-mencing | |
|-------------------|--|-------------------|---|-------------------|--|
| | JANUARY | | APRIL (contd.) | | SEPTEMBER (contd.) |
| 2 | Tiree, faint glow to north | 12 | Wick, 24h. | 28 | Wick |
| 5 | Fortrose, Tiree, to north, Wick, 23h. | 13 | Duntulm | 29 | Kinloss |
| 11 | Wick | 17 | Fortrose | | |
| 12 | Grimsetter, faint to north | 21 | Benbecula, faint to north-west, Stornoway | | OCTOBER |
| 14 | Grimsetter, faint to north, Tiree | 24 | Benbecula, 03h., faint, Stornoway, 03h. | | |
| 15 | Stornoway | 25 | Benbecula, faint to north, Grimsetter, Stornoway, West Freugh, 24h. | | |
| 26 | Benbecula, 23h., to north-west, Buddon Ness, Duntulm, Edinburgh, Fortrose, Grimsetter, 22h.-23h., moderate to north, Leuchars, 21h., faint to north, Nairn, Wick, 18h.-23h. | 26 | Benbecula, to north-west, Grimsetter, Stornoway | 5 | Tiree |
| 27 | Grimsetter, moderate to north, Wick, 21h.-22h. | | | 7 | Forres, Fortrose, Grimsetter, 21h., bright, Kinloss, 22h.-23h., Nairn, Turnhouse, faint to north north-west |
| 28 | Dyce, 21h., to north-west, Glenlivet, 20h., Fortrose, Gordon Castle, Grimsetter, to north, Lossiemouth, 20h.45m., Stornoway, Sule Skerry, 21h., Tiree, streamers, Wick, 21h., to north | | MAY | 8 | Benbecula, Grimsetter, Kinloss, 24h., Wick, 24h. |
| 31 | Nairn, 20h., Tiree | 1 | Benbecula, 24h.-01h., north to north-east, Leuchars, 24h., strong to north, Wick | 10 | Benbecula, Grimsetter, Tiree |
| | FEBRUARY | 2 | Benbecula, Grimsetter, brilliant, Wick | 11 | Benbecula, Grimsetter |
| 1 | Benbecula, Fortrose, Grimsetter, faint, Dundee, Wick, Tiree | 4 | Tiree | 19 | Benbecula, Nairn |
| 6 | Benbecula, slight, Tiree, Wick, to north | 6 | Benbecula, Kinloss | 20 | Benbecula, Wick |
| 8 | Benbecula, Duntulm, Stornoway, Tiree | 8 | Benbecula | 22 | Wick |
| 9 | Benbecula, to north-west, Buddon Ness, Duntulm, Fortrose, 20h.-22h., Glenlivet, Tiree | 9 | Benbecula, Buddon Ness, Grimsetter, 23h., slight, Leuchars, 23h., Tiree, West Freugh, 23h., intense | 26 | Ardkinglas, 21h.30m., Fortrose, Grimsetter, Kinloss |
| 10 | Benbecula, Tiree | 10 | Benbecula, Grimsetter, all directions, Prestwick, West Freugh | 27 | Nairn, Wick |
| 11 | Benbecula, Dyce | 11 | Benbecula | 28 | Ardkinglas, Benbecula, Edinburgh, Fortrose, Kinloss, Oban, Prestwick, brilliant, Nairn, Tiree, 20h.-23h., Turnhouse, West Freugh, bright to north-east |
| 12 | Grimsetter | 25 | Tiree | 29 | Benbecula, 24h., to north, Rothesay, 19h.30m.-20h.30m., Tiree, 24h., to north |
| 13 | Benbecula | | | | |
| 23 | Duntulm, Fortrose, Kinloss, Stornoway, Tiree | | JUNE | | NOVEMBER |
| 24 | Tiree | | Nil | 2 | Tiree, Wick, 19h.-23h., to north-west |
| 25 | Eskdalemuir, Lauder, Grimsetter | | | 3 | Buddon Ness, Edinburgh, 21h., Wick, Tiree |
| 26 | Cape Wrath | | JULY | 4 | Benbecula, Kinloss, 03h.-04h., to north, Tiree, Wick 03h., to north-east and north-west |
| 27 | Benbecula, Kinloss, Stornoway, West Freugh Wick | 30 | Tiree, to north | 6 | Tiree, Wick, 18h., to north-west |
| | | | | 7 | Kinloss, Tiree, West Freugh, Wick |
| | MARCH | | AUGUST | 8 | Benbecula |
| 9 | Benbecula, bright before 23h.30m., Tiree | 19 | Grimsetter, 24h., to north | 13 | Benbecula, Duntulm |
| 10 | Tiree | 21 | Wick, active ray north-west to north | 14 | Wick |
| 11 | Tiree | 30 | Benbecula, 20h.-24h., faint, Tiree | 17 | West Freugh |
| 13 | Benbecula | 31 | Benbecula, Tiree, Wick, 24h., to north | 21 | Wick |
| 14 | Tiree | | | 22 | Nairn |
| 15 | Benbecula, faint glow | | SEPTEMBER | 23 | Dyce |
| 26 | Tiree | 2 | Wick | 25 | Benbecula, Buddon Ness, slight, 23h., Duntulm, Kinloss |
| 27 | Grimsetter, 23h.-03h., to north | 3 | Tiree | | DECEMBER |
| 29 | Ardrishaig, Buddon Ness, 23h., Dyce, 23h.-03h., Tiree, Wick | 5 | Benbecula, Tiree | 2 | Wick |
| 30 | Grimsetter, Tiree, Wick | 6 | Grimsetter, Tiree, Wick | 4 | Wick, Benbecula |
| | | 7 | Grimsetter, Tiree | 5 | Wick, Benbecula |
| | APRIL | 10 | Wick | 6 | Wick, 18h., to north-west |
| 2 | Grimsetter, Stornoway, Tiree, Wick | 11 | Benbecula, Wick | 8 | Benbecula, Fortrose, Huntly, 20h., Kinloss, 20h., to north, Nairn, Wick, 19h.-22h., bright |
| 3 | Benbecula, slight in north-west, Grimsetter | 12 | Benbecula, Grimsetter, Wick | 12 | Wick, 23h., to west and north-west |
| 4 | Duntulm, Nairn | 13 | Wick, Stornoway | 13 | Wick, 24h., to west and north-west |
| 5 | Benbecula, glow to north-west, Nairn, Tiree 01h., to north | 19 | Fortrose | 18 | Wick, 22h., north-east to north-west |
| 6 | Tiree, faint to north | 23 | Duntulm | 19 | Wick, 24h., to west |
| 7 | Benbecula, glow to north, Stornoway, Tiree | 25 | Aberlady, Benbecula, Carnoustie, Dalcross, Dundee, Eskdalemuir, Duntulm, Fortrose, Glenlivet, Leuchars, Nairn, Perth, Swinton, Turnhouse, West Freugh, Wick | 22 | Dyce, 18h., Gordon Castle, Kinloss, 21h.-23h., Stornoway, Tiree, Wick |
| 8 | Buddon Ness, Prestwick, Tiree, faint to north | 26 | Benbecula, Cape Wrath, Dyce, 24h.-02h., to north, Fortrose, Grimsetter, Kinloss, 03h., Leuchars, 24h.-02h., brilliant, Prestwick, 24h., to north West Freugh, 24h., to north, Wick, 24h.-04h. | 23 | Wick |
| 10 | Benbecula, Grimsetter | 27 | Benbecula, Dyce, Fortrose, Tiree | 28 | Benbecula, Grimsetter, Fortrose, Tiree, Wick |
| 11 | Benbecula, faint to north-west | 28 | Benbecula, Fortrose, Grimsetter, Stornoway, | 30 | Tiree |
| 12 | Tiree, arc north-west to north-east | | | 31 | Benbecula, 24h., to north-west, Dyce, 01h., to north-west, Kinloss, Nairn, Stornoway, 01h., to north-west, Tiree, 01h.-02h., to north |

ESKDALEMUIR

ESKDALEMUIR OBSERVATORY

Latitude 55°19' N.
Longitude 3°12' W.
G.M.T. of Local Mean Noon 12h.13m.
Height of site above M.S.L. 235 to 250 metres

INTRODUCTION

Reference should be made to the 1938 volume for details of site and meteorological instruments. The only important change since that date was the replacement of the Beckley rain-gauge by the Dines tilting syphon recorder in September 1940.

Notes on the meteorological summaries

The extreme temperatures during the year were 296·7°A (74·7°F) on June 5 and 263·6°A (15·1°F) on March 12 and December 11. December 11, with a mean temperature of 267·1°A (21·4°F), was the coldest day of the year and July 20, with 289·9°A (62·4°F), was the hottest. There was one "ice day", i.e. a day with maximum temperature below 273°A.

The total rainfall for the year, 1694·1 mm (66·70in.), was greater than average. Snow fell on 73 days.

The total duration of bright sunshine, 1206·4 hr, was greater than average.

The highest gust of wind during the year, 38·0 m/sec (74 knots) occurred on December 30. The highest hourly speed, 17·4 m/sec (34 knots) occurred on December 4.

The results of the harmonic analysis of the diurnal inequalities of pressure are set out in the accompanying table. For purposes of comparison the corresponding data are also given derived from the mean inequalities for the period 1911-1920 by Dr. A. Crichton Mitchell*

*MITCHELL, A.C.; On the diurnal variation of atmospheric pressure at Eskdalemuir and Castle O'er, Dumfries-shire. *Quart. J.R. met. Soc.*, London, 50, 1924, p.127.

TABLE 66 - HARMONIC COEFFICIENTS OF THE DIURNAL INEQUALITY OF ATMOSPHERIC PRESSURE

Values of c_n , α_n in the series $\sum c_n \sin(15nt + \alpha_n)$, t being local mean time reckoned in hours from midnight

| | c_1 | | α_1 | | c_2 | | α_2 | | c_3 | | α_3 | | c_4 | | α_4 | |
|-----------------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|
| | 1951 | 1911-1920 | 1951 | 1911-1920 | 1951 | 1911-1920 | 1951 | 1911-1920 | 1951 | 1911-1920 | 1951 | 1911-1920 | 1951 | 1911-1920 | 1951 | 1911-1920 |
| | mb. | mb. | ° | ° | mb. | mb. | ° | ° | mb. | mb. | ° | ° | mb. | mb. | ° | ° |
| January | 0.40 | 0.09 | 179 | 346 | 0.33 | 0.23 | 161 | 152 | 0.13 | 0.13 | 345 | 345 | 0.05 | 0.05 | 235 | 214 |
| February | 0.12 | 0.12 | 123 | 215 | 0.36 | 0.27 | 152 | 138 | 0.06 | 0.08 | 9 | 341 | 0.06 | 0.04 | 48 | 68 |
| March | 0.03 | 0.13 | 354 | 185 | 0.32 | 0.30 | 146 | 145 | 0.06 | 0.05 | 320 | 335 | 0.04 | 0.05 | 33 | 25 |
| April | 0.05 | 0.21 | 126 | 92 | 0.30 | 0.30 | 146 | 155 | 0.04 | 0.02 | 355 | 156 | 0.07 | 0.05 | 199 | 356 |
| May | 0.48 | 0.23 | 65 | 53 | 0.33 | 0.27 | 155 | 147 | 0.08 | 0.07 | 146 | 160 | 0.02 | 0.03 | 1 | 330 |
| June | 0.24 | 0.15 | 38 | 54 | 0.26 | 0.23 | 140 | 146 | 0.07 | 0.08 | 174 | 161 | 0.01 | 0.02 | 281 | 326 |
| July | 0.11 | 0.17 | 277 | 69 | 0.25 | 0.21 | 153 | 141 | 0.07 | 0.08 | 141 | 156 | 0.03 | 0.02 | 268 | 300 |
| August | 0.26 | 0.11 | 197 | 115 | 0.19 | 0.24 | 152 | 148 | 0.05 | 0.06 | 148 | 157 | 0.04 | 0.05 | 300 | 331 |
| September | 0.08 | 0.12 | 136 | 88 | 0.30 | 0.31 | 332 | 152 | 0.02 | 0.01 | 127 | 111 | 0.06 | 0.05 | 340 | 345 |
| October | 0.02 | 0.11 | 138 | 76 | 0.35 | 0.31 | 156 | 159 | 0.08 | 0.06 | 8 | 8 | 0.02 | 0.04 | 53 | 33 |
| November | 0.39 | 0.13 | 139 | 183 | 0.21 | 0.24 | 144 | 168 | 0.08 | 0.10 | 3 | 9 | 0.02 | 0.01 | 359 | 146 |
| December | 0.24 | 0.14 | 321 | 97 | 0.34 | 0.21 | 151 | 147 | 0.14 | 0.12 | 195 | 4 | 0.05 | 0.07 | 180 | 213 |
| Arithmetic mean | 0.20 | 0.14 | | | 0.29 | 0.26 | | | 0.07 | 0.07 | | | 0.04 | 0.04 | | |
| Year | 0.09 | 0.09 | 141 | 91 | 0.29 | 0.26 | 151 | 150 | 0.02 | 0.02 | 20 | 42 | 0.02 | 0.02 | 335 | 342 |
| Winter | 0.24 | 0.04 | 169 | 165 | 0.31 | 0.24 | 152 | 151 | 0.10 | 0.11 | 201 | 355 | 0.01 | 0.02 | 1 | 189 |
| Equinox | 0.30 | 0.11 | 123 | 104 | 0.32 | 0.31 | 150 | 153 | 0.02 | 0.02 | 343 | 4 | 0.04 | 0.04 | 7 | 9 |
| Summer | 0.11 | 0.15 | 70 | 67 | 0.26 | 0.24 | 149 | 146 | 0.07 | 0.07 | 152 | 159 | 0.02 | 0.03 | 300 | 324 |

"Winter" comprises the four months January, February, November, December; "Equinox" the months March, April, September, October; and "Summer" May to August.

Terrestrial Magnetism

Reference should be made to the 1938 volume for notes on the instruments and tables.

Notes on the results

Comparing mean values on all days of 1951 with those for 1950, it is noted that H increased by 17γ , D (West) decreased by 7.7 and Z increased by 13γ . The changes in the deduced quantities N, W, I , and F are $+25\gamma$, -34γ , -0.9 and $+18\gamma$. If these changes are compared with those for previous years the discontinuities introduced on January 1, 1934, in H and Z and the components derived from them must be kept in mind.

The ranges between the extreme values recorded during 1951 were H 1536γ D $4^{\circ}10'8$ and Z 1467γ . The range of $4^{\circ}10'8$ in declination is equivalent to a range of about 1210γ in the component of force perpendicular to the magnetic meridian.

The K index is fully described in *Terrestrial Magnetism and Atmospheric Electricity**. Briefly, a figure is allotted on a scale 0-9 to each 3-hour interval. The figure is a measure of the range of magnetic force during that period, measured from a curved line which represents the normal quiet day variation. The figures are first allotted from the H magnetograms and then increased, if necessary, by inspection of the D and Z curves so that the most disturbed component determines the final figure. The scale of ranges in γ corresponding to the figures 0-9 varies from observatory to observatory. The lower limit of each number for Eskdalemuir is :

| | | | | | | | | | | |
|----------|---|---|----|----|----|-----|-----|-----|-----|-----|
| K | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| γ | 0 | 8 | 15 | 30 | 60 | 105 | 180 | 300 | 500 | 750 |

Beginning with 1947 some changes have been made in the tables accompanying these notes. The month by month commentary on the autographic records has been omitted, and a change has been made in the table formerly headed "Principal magnetic disturbances". It is intended that all the disturbances, which would have been included in the previous

*BARTELS, J., HECK, N.H., AND JOHNSTON, H.F.: The three-hour-range index measuring geomagnetic activity. *Terr. Magn. atmos. Elect.*, Baltimore. *Ma.* 44, 1939, p.411.

type of table, will still be included, with, however, additional disturbances of the form of sudden commencements and those which can be recognised as being solar flare effects. The table is thus divided into three parts:

- (a) Disturbances noteworthy for some reason (usually, but not always, range) and without a sudden commencement.
- (b) Well marked sudden commencements whether followed by a large disturbance or not.
- (c) Disturbances accompanying a solar flare or other known solar flare effect.

The time given of commencement and ending of disturbances in (a) must depend on an arbitrary judgment. The list of sudden commencements under (b) will usually be a little shorter than that given in the I.A.T.M.E. Bulletins because a somewhat stricter meaning has been given to the words "well marked", and also because the sharp beginnings of small polar disturbances have been omitted. The (c) table has been made as complete as possible by a careful scrutiny of the magnetograms at the time of any known solar flare or solar flare effect, but a small "crochet" can easily be masked by other disturbance. The signs given to the movements of *H*, *D* and *Z* are positive for increasing *H* or *Z* and an increase of force towards the east (that is a decreasing westerly declination).

Particulars of the same disturbances are given in both the Lerwick and the Eskdalemuir sections of the *Observatories' Year Book*, even if the disturbance at one of the stations is relatively small.

In Table 66 the values of mean absolute daily range for the months and seasons are brought together. For convenience of comparison the ranges of declination in angle have been converted to units of force of the component perpendicular to the magnetic meridian. Table 67 gives the frequency distribution of absolute daily ranges and compares the percentage distribution for 1951 with that for the 11-year period 1932-1942. Table 68 gives the average values of the diurnal inequality ranges for the year and seasons for the period 1932-1942 (not the values of the range of the representative mean diurnal inequalities for this period) along with the 1951 values expressed as a percentage of the average values. The units employed are 1γ for force and 1' for declination.

Irregular changes in declination. - In connection with the supply of declination data to mine surveyors, it has been the practice to classify the hourly periods between the exact hours G.M.T. into four groups according to the range in declination within each period. The range limits which were adopted in consultation with representative mine surveyors are: less than 5', between 5' and 15', between 15' and 30', and greater than 30'. The range is less than 5' in about 85 per cent of the hourly periods. The actual frequencies of occurrence in the last three of the four divisions mentioned are set out below.

Number of cases per month, 1951

| Range interval | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year |
|----------------|------|------|------|------|-----|------|------|------|-------|------|------|------|------|
| 5-15' | 130 | 144 | 167 | 200 | 127 | 79 | 126 | 147 | 213 | 140 | 125 | 165 | 1763 |
| 15-30' | 19 | 34 | 23 | 30 | 14 | 9 | 12 | 20 | 44 | 30 | 12 | 23 | 270 |
| >30' | 2 | 2 | 1 | 0 | 5 | 1 | 2 | 0 | 19 | 9 | 4 | 3 | 48 |

Hourly distribution, 1951

| Range interval | Hour (G.M.T.) ending at | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|-------------------------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 5-15' | 101 | 104 | 96 | 74 | 81 | 62 | 53 | 56 | 54 | 51 | 62 | 58 | 44 | 42 | 51 | 71 | 63 | 83 | 75 | 85 | 86 | 105 | 109 | 97 |
| 15-30' | 16 | 19 | 10 | 8 | 4 | 3 | 7 | 5 | 2 | 2 | 1 | 1 | 1 | 3 | 5 | 7 | 14 | 15 | 16 | 33 | 32 | 22 | 20 | 24 |
| >30' | 5 | 2 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 3 | 3 | 6 | 6 | 4 | 5 | 2 | 2 |

TABLE 67 - ABSOLUTE DAILY RANGE AND MEAN MONTHLY VALUES

| | Mean absolute daily range | | | | | | Mean daily range expressed as percentage of yearly mean | | | | | |
|-----------|---------------------------|----------|----------|--------------|----------|----------|---|-----|-----|--------------|-----|-----|
| | 1951 | | | Mean 1932-42 | | | 1951 | | | Mean 1932-42 | | |
| | H | D | Z | H | D | Z | H | D | Z | H | D | Z |
| | γ | γ | γ | γ | γ | γ | % | % | % | % | % | % |
| January | 69 | 91 | 47 | 78 | 79 | 44 | 54 | 81 | 51 | 81 | 91 | 77 |
| February | 117 | 107 | 67 | 76 | 86 | 50 | 91 | 96 | 73 | 79 | 99 | 88 |
| March | 112 | 103 | 81 | 122 | 113 | 82 | 87 | 92 | 88 | 127 | 130 | 144 |
| April | 127 | 119 | 109 | 125 | 103 | 79 | 99 | 106 | 118 | 130 | 118 | 139 |
| May | 138 | 115 | 94 | 111 | 86 | 66 | 108 | 103 | 102 | 116 | 99 | 116 |
| June | 153 | 95 | 101 | 100 | 81 | 50 | 119 | 85 | 110 | 104 | 93 | 88 |
| July | 144 | 97 | 100 | 106 | 82 | 53 | 112 | 87 | 109 | 110 | 94 | 93 |
| August | 129 | 102 | 84 | 102 | 85 | 57 | 101 | 91 | 91 | 106 | 98 | 100 |
| September | 209 | 184 | 179 | 102 | 95 | 64 | 163 | 164 | 195 | 106 | 109 | 112 |
| October | 164 | 124 | 106 | 97 | 94 | 65 | 128 | 111 | 115 | 101 | 108 | 114 |
| November | 91 | 105 | 68 | 67 | 75 | 41 | 71 | 94 | 74 | 70 | 86 | 72 |
| December | 88 | 104 | 64 | 61 | 69 | 40 | 69 | 93 | 70 | 64 | 79 | 70 |
| Winter | 91 | 102 | 61 | 70 | 77 | 44 | 71 | 91 | 66 | 73 | 89 | 77 |
| Equinox | 153 | 133 | 119 | 111 | 101 | 72 | 119 | 119 | 129 | 116 | 116 | 126 |
| Summer | 141 | 102 | 95 | 105 | 84 | 57 | 110 | 91 | 103 | 109 | 97 | 100 |
| Year | 128 | 112 | 92 | 96 | 87 | 57 | .. | .. | .. | .. | .. | .. |

"Winter" comprises the four months January, February, November, December; "Equinox" the months March, April, September, October; and "Summer" May to August

TABLE 68 - FREQUENCY DISTRIBUTION OF ABSOLUTE DAILY RANGE

| Range | Number of cases, 1951 | | | Percentage distribution | | | | | |
|--------------|-----------------------|----|----|-------------------------|---------|------|---------|------|---------|
| | H | D | Z | H | | D | | Z | |
| | | | | 1951 | 1932-42 | 1951 | 1932-42 | 1951 | 1932-42 |
| γ | | | | % | % | % | % | % | % |
| 0 - 9 | 0 | 0 | 4 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 3.0 |
| 10 - 19 | 1 | 1 | 26 | 0.3 | 1.0 | 0.3 | 0.4 | 7.1 | 15.8 |
| 20 - 29 | 11 | 3 | 51 | 3.0 | 4.2 | 0.8 | 2.9 | 14.0 | 22.1 |
| 30 - 39 | 11 | 8 | 36 | 3.0 | 6.6 | 2.2 | 5.7 | 9.8 | 16.8 |
| 40 - 49 | 11 | 19 | 44 | 3.0 | 8.7 | 5.2 | 8.1 | 12.0 | 9.5 |
| 50 - 59 | 28 | 20 | 31 | 7.7 | 11.4 | 5.5 | 13.2 | 8.5 | 6.9 |
| 60 - 69 | 21 | 31 | 20 | 5.7 | 13.2 | 8.5 | 14.0 | 5.5 | 5.1 |
| 70 - 79 | 38 | 37 | 15 | 10.4 | 10.6 | 10.1 | 12.5 | 4.1 | 3.4 |
| 80 - 89 | 35 | 50 | 22 | 9.6 | 9.3 | 13.7 | 10.3 | 6.0 | 2.7 |
| 90 - 99 | 31 | 42 | 10 | 8.5 | 6.9 | 11.5 | 7.8 | 2.7 | 2.3 |
| 100 - 109 | 31 | 26 | 7 | 8.5 | 5.3 | 7.1 | 5.3 | 1.9 | 1.8 |
| 110 - 119 | 18 | 22 | 13 | 4.9 | 4.5 | 6.0 | 3.8 | 3.6 | 1.4 |
| 120 - 129 | 15 | 14 | 10 | 4.1 | 2.9 | 3.8 | 3.3 | 2.7 | 1.4 |
| 130 - 139 | 12 | 17 | 13 | 3.3 | 2.7 | 4.7 | 2.5 | 3.6 | 0.9 |
| 140 - 149 | 16 | 15 | 5 | 4.4 | 1.8 | 4.1 | 1.8 | 1.4 | 0.8 |
| 150 - 159 | 11 | 5 | 4 | 3.0 | 1.9 | 1.4 | 1.7 | 1.1 | 0.5 |
| 160 - 169 | 7 | 10 | 10 | 1.9 | 1.3 | 2.7 | 1.4 | 2.7 | 0.5 |
| 170 - 179 | 9 | 10 | 2 | 2.5 | 1.0 | 2.7 | 0.8 | 0.5 | 0.2 |
| 180 - 189 | 10 | 5 | 8 | 2.7 | 0.8 | 1.4 | 0.8 | 2.2 | 0.5 |
| 190 - 199 | 8 | 1 | 2 | 2.2 | 0.7 | 0.3 | 0.7 | 0.5 | 0.4 |
| 200 + | 41 | 29 | 32 | 11.2 | 5.2 | 7.9 | 3.1 | 8.7 | 4.0 |
| Days omitted | 0 | 0 | 0 | .. | .. | .. | .. | .. | .. |

TABLE 69 - AVERAGE RANGE OF DIURNAL INEQUALITY 1932-42
WITH 1951 AS PERCENTAGE OF THIS

| | | All days | | | International quiet days | | | International disturbed days | | |
|---------|---------|----------|------|-------|--------------------------|------|-------|------------------------------|------|-------|
| | | Z | H | D | Z | H | D | Z | H | D |
| Year | 1932-42 | 25.4 | 36.9 | 8.54 | 12.8 | 33.6 | 8.17 | 71.7 | 52.1 | 11.47 |
| | 1951(%) | 109 | 105 | 104 | 122 | 106 | 104 | 149 | 107 | 108 |
| Winter | 1932-42 | 19.5 | 18.5 | 6.70 | 5.6 | 15.7 | 4.23 | 61.0 | 28.8 | 10.86 |
| | 1951(%) | 143 | 90 | 119 | 129 | 93 | 107 | 120 | 112 | 121 |
| Equinox | 1932-42 | 32.1 | 42.6 | 10.02 | 13.9 | 38.8 | 9.56 | 94.5 | 72.8 | 14.56 |
| | 1951(%) | 188 | 102 | 104 | 108 | 99 | 96 | 151 | 108 | 99 |
| Summer | 1932-42 | 29.8 | 58.0 | 11.66 | 20.8 | 49.2 | 11.37 | 71.6 | 82.2 | 12.51 |
| | 1951(%) | 152 | 113 | 104 | 135 | 120 | 114 | 175 | 98 | 104 |

TABLE 70 - NOTEWORTHY MAGNETIC DISTURBANCES AT ESKDALEMUIR

(a) Disturbances without S.C's

| Serial Number | From | | To | | Range (γ) | | | Notes |
|---------------|----------|------|----------|------|--------------------|------|-----|-----------------|
| | Date | Hour | Date | Hour | H | D | Z | |
| 1a | Feb. 27 | 00 | Feb. 27 | 09 | 270 | 232 | 142 | ? S.C. at 00.28 |
| 2a | Mar. 13 | 13 | Mar. 14 | 08 | 307 | 218 | 364 | |
| 3a | Mar. 14 | 12 | Mar. 15 | 06 | 201 | 179 | 175 | |
| 4a | Mar. 22 | 14 | Mar. 23 | 05 | 203 | 146 | 230 | |
| 5a | Apr. 20 | 12 | Apr. 23 | 07 | 254 | 236 | 234 | |
| 6a | Apr. 24 | 04 | Apr. 26 | 03 | 233 | 176 | 239 | |
| 7a | May 1 | 00 | May 2 | 03 | 439 | 295 | 355 | |
| 8a | Aug. 21 | 10 | Aug. 22 | 09 | 283 | 161 | 283 | |
| 9a | Sept. 13 | 11 | Sept. 14 | 06 | 226 | 155 | 245 | |
| 10a | Sept. 19 | 14 | Sept. 23 | 08 | 541 | 369 | 588 | |
| 11a | Sept. 25 | 10 | Sept. 26 | 07 | 1364 | 1215 | 909 | |

(b) Disturbances with a S.C.

| Serial Number | Date | Time of S.C. | End of Disturbance | | With initial reversed stroke | | | Magnitude main stroke of S.C. | | | Range of following disturbance (γ) | | | |
|---------------|---------|--------------|--------------------|------|------------------------------|-----|-------------|-------------------------------|-----|-----|---|-----|-----|-------|
| | | | Date | Hour | H | D | Z | H | D | Z | H | D | Z | |
| 1b | Feb. 28 | 14.17 | | | Yes | Yes | No | +60 | -26 | -5 | | | | Small |
| 2b | Mar. 6 | 07.50 | | | No | No | No | +24 | -9 | ? | | | | Small |
| 3b | Mar. 7 | 12.27 | | | ? | ? | ? | -44 | +24 | +3 | | | | Small |
| 4b | Mar. 16 | 10.04 | | | Yes | Yes | ? | -9 | +10 | 0 | | | | Small |
| 5b | Apr. 18 | 06.52 | Apr. 19 | 03 | ? | Yes | Yes | ? | +35 | 0 | 326 | 233 | 142 | |
| 6b | May 25 | 18.48 | May 27 | 06 | Yes | No | No | +42 | -10 | -5 | 215 | 232 | 236 | |
| 7b | June 14 | 17.51 | | | No | No | No | +92 | -25 | -6 | | | | Small |
| 8b | June 17 | 17.02 | June 18 | 10 | No | No | No | +96 | -25 | -10 | 827 | 258 | 767 | |
| 9b | June 18 | 23.14 | | | No | No | No | +48 | -4 | -5 | | | | Small |
| 10b | June 25 | 04.28 | June 25 | 24 | No | Yes | No | +24 | -22 | -3 | 172 | 149 | 131 | |
| 11b | July 1 | 22.28 | July 2 | 12 | No | No | No | +68 | -13 | ? | 600 | 345 | 628 | |
| 12b | July 31 | 00.59 | Aug. 1 | 04 | No | No | No | +28 | ? | ? | 234 | 133 | 207 | |
| 13b | Aug. 15 | 20.10 | | | No | No | No | +88 | -30 | -24 | | | | Small |
| 14b | Sept. 5 | 20.45 | | | No | No | No | +64 | -17 | -7 | | | | Small |
| 15b | Oct. 28 | 11.54 | Oct. 29 | 02 | | | Oscillatory | | | | 1536 | 711 | 727 | |
| 16b | Dec. 27 | 21.36 | Dec. 29 | 02 | Yes | No | No | +52 | -13 | -6 | 240 | 250 | 296 | |

(c) Disturbances due to Solar Flare

| Serial Number | Date | Commence- ment | Max. | End | Movement (γ) | | | K | K' | Flare or S.F.E. |
|------------------|--------|-------------------|-------|-------|-----------------------|----|---|---|----|-----------------|
| | | | | | H | D | Z | | | |
| 1c | May 8 | 15.03 | 15.20 | 16.00 | -28 | -1 | 0 | 2 | 1 | S.F. S.W.F. |
| 2c | May 14 | 11.30 | 11.33 | 11.47 | -4 | -1 | 0 | 2 | 2 | S.W.F. |

S.F. - Solar Flare

S.W.F. - Short wave radio fade out

PRESSURE AT STATION LEVEL

Monthly and annual means of hourly values in millibars at exact hours, G.M.T.

72 ESKDALEMUIR: $h_b = 237.3$ m.

Table with 25 columns (Hour G.M.T. 0-24) and 13 rows (Jan-Dec, Annual). Data represents pressure in millibars at station level.

The initial 9 or 10 of the value is omitted, i.e. 1001.42 is printed 01.42

PRESSURE REDUCED TO MEAN SEA LEVEL

Monthly and annual means of hourly values in millibars at exact hours, G.M.T.

73 ESKDALEMUIR: $h_b = 237.3$ m.

Table with 25 columns (Hour G.M.T. 0-24) and 13 rows (Jan-Dec, Annual). Data represents pressure reduced to mean sea level.

The initial 9 or 10 of the value is omitted, i.e. 1001.42 is printed 01.42

The monthly and annual values of pressure reduced to mean sea level are computed from the corresponding monthly and annual means of pressure at station level and of temperature. See General Introduction to the Meteorological Tables, 1938.

TEMPERATURE

Monthly and annual means of readings in degrees Absolute at exact hours, G.M.T.

74 ESKDALEMUIR: Louvered hut: $h_t = 0.9$ m.

Table with 25 columns (Hour G.M.T. 0-24) and 13 rows (Jan-Dec, Annual). Data represents temperature in degrees Absolute.

The initial 2 or 3 of the readings is omitted, i.e. 275.00 degrees Absolute is printed 75.00

Add 0.16° to obtain temperature in degrees Kelvin where $T(^{\circ}K.) = t(^{\circ}C.) + 273.16$.

MEAN RELATIVE HUMIDITY AND VAPOUR PRESSURE FOR EACH DAY

Mean percentage from readings at exact hours 0h. to 24h., G.M.T.; vapour pressure from daily mean temperature and relative humidity

76 ESKDALEMUIR: Louvered hut: h_t = 0.9 m.

Table with 12 columns for months (JANUARY to DECEMBER) and 2 rows for relative humidity and vapour pressure. Each cell contains two values (e.g., % and mb.). Includes a 'Mean*' row at the bottom.

* Mean of the column

RELATIVE HUMIDITY

Monthly and annual means of values at exact hours, G.M.T.

77 ESKDALEMUIR: h_t = 0.9 m.

Table with 25 columns for hours of the day (0 to 24) and 12 rows for months (Jan. to Dec.) plus an Annual row. Values are in percent.

VAPOUR PRESSURE

Monthly and annual means of values at exact hours, G.M.T., computed from corresponding mean values of temperature and relative humidity

78 ESKDALEMUIR: h_t = 0.9 m.

Table with 25 columns for hours of the day (0 to 24) and 12 rows for months (Jan. to Dec.) plus an Annual row. Values are in millibars.

* Mean of values, 1, 2, ..., 23, 1/2(0 + 24).

RAINFALL

Amount in millimetres, duration in hours and maximum rate of fall for each day 0h. to 24h., G.M.T.

79 ESKDALEMUIR: h_r (height of receiving surface above M.S.L.) = height of station above M.S.L. + height of receiving surface above ground = 242.0 m. + 0.4 m.

| | JANUARY | | | FEBRUARY | | | MARCH | | | APRIL | | | MAY | | | JUNE | | |
|-------|---------|----------|-----------|----------|----------|-----------|--------|----------|-----------|--------|----------|-----------|--------|----------|-----------|--------|----------|-----------|
| | Amount | Duration | Max. rate | Amount | Duration | Max. rate | Amount | Duration | Max. rate | Amount | Duration | Max. rate | Amount | Duration | Max. rate | Amount | Duration | Max. rate |
| | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. |
| 1 | 7.6 | 14.6 | 2 | 7.3 | 2.5 | 4 | 3.1 | 8.0 | 2 | 10.0 | 4.4 | 3 | 21.5 | 13.2 | 3 | ... | ... | ... |
| 2 | 0.2 | 0.9 | ... | 14.2 | 14.1 | 3 | 0.3 | 0.8 | ... | ... | ... | ... | 6.2 | 4.4 | 13 | ... | ... | ... |
| 3 | ... | ... | ... | 6.7 | 3.5 | 6 | 0.8 | 4.3 | ... | 18.5 | 8.3 | 5 | ... | ... | ... | ... | ... | ... |
| 4 | 7.8 | 5.4 | 2 | 10.0 | 12.8 | 2 | ... | ... | ... | 10.4 | 5.4 | 10 | 1.1 | 1.9 | 1 | ... | ... | ... |
| 5 | 1.9 | 4.5 | ... | 9.6 | 12.4 | 4 | 5.1 | 9.4 | 3 | 0.2 | 0.4 | ... | ... | ... | ... | ... | ... | ... |
| 6 | 7.4 | 12.9 | 2 | 8.8 | 6.3 | 2 | 0.4 | 0.6 | ... | 5.0 | 3.3 | 14 | ... | ... | ... | 0.1 | 0.2 | ... |
| 7 | 3.3 | 4.4 | 4 | 4.0 | 3.3 | 1 | 6.0 | 8.3 | 2 | 9.9 | 11.6 | 3 | ... | ... | ... | 1.5 | 0.8 | 4 |
| 8 | 1.9 | 1.0 | 7 | 8.0 | 8.5 | 2 | ... | ... | ... | 0.2 | 0.3 | ... | 2.5 | 4.3 | 6 | ... | ... | ... |
| 9 | 0.6 | 1.4 | ... | ... | ... | ... | 0.1 | ... | ... | 1.8 | 1.0 | 11 | ... | ... | ... | ... | ... | ... |
| 10 | 15.8 | 11.8 | 9 | ... | ... | ... | 2.0 | 2.0 | 1 | 0.1 | 0.1 | ... | ... | ... | ... | 0.5 | 1.7 | 1 |
| 11 | 28.8 | 13.7 | 11 | 0.3 | 0.4 | ... | 0.1 | 0.8 | ... | 6.4 | 6.7 | 2 | ... | ... | ... | 5.9 | 9.1 | 5 |
| 12 | 29.0 | 15.1 | 20 | 6.0 | 10.4 | 1 | ... | ... | ... | 26.8 | 9.3 | 11 | ... | ... | ... | 3.0 | 10.5 | 3 |
| 13 | 1.2 | 1.0 | ... | 2.1 | 3.2 | 1 | 4.2 | 4.3 | 2 | 3.0 | 1.6 | 1 | ... | ... | ... | 5.7 | 9.0 | 7 |
| 14 | 2.9 | 2.9 | 2 | ... | ... | ... | 7.9 | 5.6 | 5 | 2.4 | 2.5 | 2 | ... | ... | ... | 1.6 | 2.3 | 3 |
| 15 | ... | ... | ... | 0.3 | 3.0 | ... | ... | ... | ... | 29.9 | 11.7 | 18 | 0.2 | 0.5 | ... | 0.1 | 0.1 | ... |
| 16 | 15.5 | 9.6 | 7 | 6.8 | 7.3 | 7 | 0.9 | 3.4 | ... | 3.2 | 2.9 | 5 | ... | ... | ... | 0.1 | 0.1 | 3 |
| 17 | 34.8 | 15.5 | 7 | 13.2 | 9.4 | 4 | 4.7 | 4.9 | 2 | ... | ... | ... | ... | ... | ... | 27.9 | 7.4 | 40 |
| 18 | 3.2 | 1.2 | 8 | 2.0 | 5.0 | 1 | 7.8 | 19.4 | 1 | 0.7 | 1.5 | ... | ... | ... | ... | 2.2 | 2.4 | 8 |
| 19 | 1.6 | 2.9 | ... | 7.4 | 7.2 | 2 | 2.4 | 5.7 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 20 | 1.1 | 3.1 | ... | 3.9 | 6.6 | 1 | ... | ... | ... | ... | ... | ... | 10.9 | 8.1 | (4) | 5.0 | 6.1 | 28 |
| 21 | 3.1 | 4.3 | ... | 0.6 | 0.6 | ... | 14.1 | 11.6 | 3 | ... | ... | ... | 1.6 | 8.5 | ... | 3.8 | 4.7 | 5 |
| 22 | 2.6 | 3.1 | 2 | 1.0 | 1.6 | ... | 29.9 | 23.8 | 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 23 | ... | ... | ... | 1.0 | 0.6 | 3 | 0.6 | 0.6 | ... | 0.2 | 0.2 | ... | ... | ... | ... | ... | ... | ... |
| 24 | ... | ... | ... | 0.2 | 0.4 | ... | 0.6 | 0.5 | ... | ... | ... | ... | 7.0 | 3.1 | 15 | ... | ... | ... |
| 25 | 0.5 | 1.0 | ... | 0.1 | 0.3 | ... | 8.4 | 6.1 | 3 | 1.6 | 0.9 | 4 | ... | ... | ... | 4.2 | 2.6 | 9 |
| 26 | 2.1 | 4.3 | 1 | 3.6 | 3.6 | 3 | 5.1 | 8.9 | 1 | 4.9 | 2.5 | 4 | 0.2 | 0.3 | ... | ... | ... | ... |
| 27 | 0.5 | 1.8 | ... | ... | ... | ... | 0.2 | 0.3 | ... | 0.1 | 0.1 | ... | 6.1 | 10.1 | 2 | ... | ... | ... |
| 28 | 0.1 | 0.2 | ... | ... | ... | ... | 0.4 | 0.9 | ... | ... | ... | ... | 0.9 | 7.0 | ... | ... | ... | ... |
| 29 | ... | ... | ... | ... | ... | ... | 1.9 | 1.4 | 2 | 1.0 | 0.5 | 7 | ... | ... | ... | 0.3 | 0.4 | ... |
| 30 | 12.3 | 17.6 | (1) | ... | ... | ... | 1.6 | 1.3 | 1 | 1.3 | 1.7 | 3 | ... | ... | ... | ... | ... | ... |
| 31 | 14.3 | 12.8 | (1) | ... | ... | ... | 22.9 | 13.8 | 8 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total | 200.1 | 167.0 | - | 117.2 | 123.0 | - | 131.5 | 146.7 | - | 137.6 | 76.9 | - | 58.2 | 61.4 | - | 61.9 | 57.4 | - |

| | JULY | | | AUGUST | | | SEPTEMBER | | | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|-------|--------|----------|-----------|--------|----------|-----------|-----------|----------|-----------|---------|----------|-----------|----------|----------|-----------|----------|----------|-----------|
| | Amount | Duration | Max. rate | Amount | Duration | Max. rate | Amount | Duration | Max. rate | Amount | Duration | Max. rate | Amount | Duration | Max. rate | Amount | Duration | Max. rate |
| | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. | mm. | hr. | mm./hr. |
| 1 | ... | ... | ... | ... | ... | ... | 1.1 | 0.4 | 7 | ... | ... | ... | 2.3 | 1.9 | 4 | 3.3 | 3.2 | 13 |
| 2 | 3.4 | 5.2 | 11 | 19.2 | 9.8 | 15 | 2.3 | 0.7 | 3 | ... | ... | ... | 0.3 | 0.2 | 3 | 1.3 | 0.7 | 2 |
| 3 | 2.9 | 4.7 | 2 | 14.7 | 7.7 | 8 | 4.4 | 5.8 | 1 | ... | ... | ... | 5.1 | 3.6 | 16 | 8.0 | 14.4 | 1 |
| 4 | 0.2 | 0.7 | ... | ... | ... | ... | 20.7 | 11.8 | 4 | 0.4 | 1.4 | ... | 10.7 | 12.3 | 2 | 5.8 | 9.6 | 1 |
| 5 | 8.0 | 6.5 | 2 | 1.1 | 0.7 | 2 | 2.2 | 2.5 | 1 | ... | ... | ... | 25.9 | 17.1 | 7 | 7.5 | 5.2 | 5 |
| 6 | 2.9 | 7.6 | 1 | 3.0 | 3.5 | 7 | 0.2 | 0.7 | ... | ... | ... | ... | 17.9 | 12.1 | 12 | 0.3 | 0.9 | ... |
| 7 | 8.5 | 4.6 | 38 | 9.3 | 12.6 | 21 | ... | ... | ... | ... | ... | ... | 0.1 | 0.1 | ... | 5.8 | 6.3 | 16 |
| 8 | 6.3 | 2.7 | 58 | 9.0 | 8.7 | 9 | ... | ... | ... | ... | ... | ... | 2.2 | 3.0 | 1 | 25.1 | 12.5 | 46 |
| 9 | 9.4 | 5.0 | 6 | 4.5 | 2.6 | 25 | ... | ... | ... | ... | ... | ... | 2.0 | 5.9 | 1 | 3.3 | 4.2 | 1 |
| 10 | 18.5 | 10.5 | 48 | 0.3 | 0.2 | 1 | ... | ... | ... | 1.3 | 2.1 | ... | 13.3 | 10.3 | 7 | ... | ... | ... |
| 11 | 9.6 | 9.5 | 14 | 2.8 | 1.3 | 7 | 1.3 | 2.6 | 1 | ... | ... | ... | 6.8 | 10.2 | 2 | ... | ... | ... |
| 12 | 8.0 | 5.0 | 8 | 3.9 | 5.6 | 7 | 11.7 | 12.0 | 2 | ... | ... | ... | 1.1 | 1.0 | 4 | 0.7 | 1.1 | ... |
| 13 | 7.1 | 9.5 | 3 | 0.3 | 1.0 | ... | 13.2 | 7.2 | 19 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 14 | ... | ... | ... | ... | ... | ... | 9.0 | 4.0 | 16 | ... | ... | ... | 0.3 | 0.7 | ... | 12.8 | 15.1 | (1) |
| 15 | ... | ... | ... | 0.2 | 0.5 | ... | 14.9 | 5.6 | 18 | 0.6 | 4.5 | ... | 10.7 | 9.2 | ... | 8.7 | 13.1 | (1) |
| 16 | ... | ... | ... | 0.9 | 0.8 | 8 | 0.5 | 0.3 | ... | 5.0 | 18.3 | 8 | 30.5 | 10.5 | 27 | 4.0 | 7.5 | ... |
| 17 | 0.3 | 1.5 | ... | 11.2 | 10.3 | 6 | ... | ... | ... | ... | ... | ... | 27.7 | 10.1 | 41 | 1.9 | 2.9 | ... |
| 18 | ... | ... | ... | 12.5 | 8.2 | 7 | 0.2 | 1.8 | ... | ... | ... | ... | 6.7 | 6.4 | 2 | 17.5 | 7.0 | 7 |
| 19 | ... | ... | ... | 7.3 | 4.8 | 32 | ... | ... | ... | ... | ... | ... | 15.7 | 8.4 | 7 | 28.2 | 16.9 | 4 |
| 20 | ... | ... | ... | 1.6 | 0.7 | 7 | ... | ... | ... | 1.7 | 0.5 | 26 | 23.8 | 13.5 | 17 | 3.1 | 3.1 | ... |
| 21 | ... | ... | ... | 24.6 | 8.2 | 36 | ... | ... | ... | 0.2 | 0.3 | ... | 0.3 | 1.0 | ... | 4.4 | 4.0 | (2) |
| 22 | 9.8 | 6.5 | 5 | 1.7 | 0.8 | 28 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5.7 | 5.0 | (2) |
| 23 | 3.8 | 8.9 | 2 | 3.3 | 3.4 | 1 | 4.6 | 5.1 | 3 | 0.2 | ... | ... | 6.6 | 4.1 | 7 | 6.1 | 5.6 | (2) |
| 24 | ... | ... | ... | 1.6 | 3.0 | 1 | 39.5 | 15.9 | 34 | ... | ... | ... | 14.3 | 10.6 | 17 | 25.6 | 16.0 | ... |
| 25 | ... | ... | ... | 9.9 | 4.4 | 8 | 33.3 | 12.6 | 66 | ... | ... | ... | 1.2 | 3.5 | ... | 0.4 | 0.6 | ... |
| 26 | 8.9 | 11.2 | 7 | 11.5 | 5.9 | 35 | 6.5 | 4.9 | 15 | ... | ... | ... | 0.5 | 1.8 | ... | ... | ... | ... |
| 27 | 11.3 | 15.3 | 6 | 2.6 | 2.0 | 6 | 9.0 | 5.3 | 23 | ... | ... | ... | 8.9 | 9.2 | 11 | 30.8 | 15.8 | (4) |
| 28 | ... | ... | ... | 11.8 | 9.0 | 25 | 0.6 | 1.0 | 4 | ... | ... | ... | 13.0 | 6.7 | 26 | 10.6 | 5.3 | (3) |
| 29 | ... | ... | ... | 7.4 | 4.9 | 47 | ... | ... | ... | ... | ... | ... | 8.3 | 8.3 | 2 | 0.1 | 0.1 | ... |
| 30 | ... | ... | ... | 1.5 | 1.3 | 3 | ... | ... | ... | 0.3 | 1.3 | ... | 3.4 | 2.8 | 12 | 13.9 | 9.7 | (4) |
| 31 | ... | ... | ... | 3.8 | 0.6 | 16 | ... | ... | ... | 2.0 | 2.1 | ... | ... | ... | ... | 5.8 | 8.0 | (1) |
| Total | 118.9 | 114.9 | - | 181.5 | 122.5 | - | 175.2 | 100.2 | - | 11.7 | 30.5 | - | 259.6 | 184.5 | - | 240.7 | 193.8 | - |

RAINFALL

Monthly and annual totals of amounts in sixty-minute periods between exact hours, G.M.T.

80 ESKDALEMUIR: $h_r = 242.0$ m. + 0.4 m.

| | Hour G.M.T. | | | | | | | | | | | | | | | | | | | | | | | | 0-24 |
|--------|-------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | |
| | millimetres | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | 12.2 | 11.1 | 9.4 | 12.6 | 11.0 | 11.7 | 5.4 | 6.3 | 9.7 | 6.9 | 6.3 | 9.0 | 6.5 | 5.9 | 4.7 | 5.3 | 7.9 | 6.2 | 6.2 | 10.1 | 7.6 | 6.2 | 8.8 | 13.1 | 200.1 |
| Feb. | 7.1 | 7.7 | 9.3 | 8.0 | 6.5 | 3.3 | 3.0 | 2.6 | 2.2 | 3.2 | 5.4 | 7.2 | 5.5 | 5.1 | 4.5 | 3.5 | 6.1 | 3.8 | 6.8 | 4.3 | 2.1 | 1.6 | 3.6 | 4.8 | 117.2 |
| Mar. | 3.7 | 5.3 | 5.0 | 2.7 | 4.1 | 3.9 | 4.5 | 5.6 | 6.6 | 8.5 | 6.4 | 8.9 | 6.4 | 6.0 | 9.3 | 6.9 | 6.3 | 3.9 | 4.0 | 5.0 | 4.2 | 3.5 | 5.3 | 5.5 | 131.5 |
| Apr. | 6.2 | 7.2 | 4.0 | 4.0 | 4.7 | 4.3 | 6.1 | 2.7 | 3.1 | 1.8 | 5.3 | 7.8 | 7.0 | 4.3 | 3.6 | 4.6 | 3.2 | 6.4 | 13.7 | 10.6 | 6.3 | 6.7 | 6.1 | 7.9 | 137.6 |
| May | 0.3 | 0.8 | 1.2 | 1.4 | 1.1 | 1.7 | 2.9 | 2.4 | 4.4 | 2.9 | 4.7 | 6.6 | 9.9 | 6.4 | 2.0 | 2.1 | 1.9 | 2.7 | 0.7 | 0.2 | 0.1 | 0.5 | 0.8 | 0.5 | 58.2 |
| June | 2.6 | 3.9 | 5.8 | 9.4 | 1.2 | 1.9 | 0.6 | 0.5 | 0.6 | 1.1 | 0.2 | 1.2 | 1.2 | 3.4 | 3.8 | 10.1 | 3.7 | 1.1 | 0.5 | 2.3 | 1.3 | 1.1 | 3.0 | 1.4 | 61.9 |
| July | 9.9 | 5.5 | 4.2 | 5.9 | 8.6 | 4.9 | 1.7 | 2.4 | 1.9 | 0.9 | 3.3 | 2.7 | 1.1 | 1.9 | 9.0 | 4.9 | 6.0 | 2.3 | 5.4 | 6.0 | 7.7 | 10.0 | 7.0 | 5.7 | 118.9 |
| Aug. | 12.3 | 5.8 | 6.4 | 8.9 | 7.3 | 8.3 | 4.5 | 6.0 | 2.7 | 2.9 | 3.8 | 6.7 | 2.1 | 4.3 | 6.3 | 9.9 | 8.7 | 13.4 | 16.5 | 5.7 | 13.0 | 7.6 | 8.7 | 9.7 | 181.5 |
| Sept. | 16.0 | 7.5 | 6.7 | 9.5 | 7.4 | 12.2 | 6.9 | 5.7 | 3.4 | 1.9 | 2.1 | 2.5 | 8.6 | 8.6 | 7.2 | 4.2 | 2.1 | 3.1 | 11.6 | 4.8 | 8.9 | 5.9 | 11.7 | 16.7 | 175.2 |
| Oct. | 0.1 | 0.5 | 0.4 | 0.1 | 0.4 | 1.5 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.4 | 0.4 | 0.1 | 0.4 | 1.3 | 0.6 | 0.5 | 1.5 | 0.8 | 0.6 | 0.9 | 0.1 | 11.7 |
| Nov. | 13.5 | 6.1 | 10.0 | 9.4 | 14.2 | 15.8 | 24.1 | 15.6 | 16.4 | 9.8 | 8.3 | 8.3 | 14.9 | 9.1 | 4.9 | 3.7 | 10.6 | 9.6 | 13.1 | 9.5 | 8.9 | 9.6 | 3.6 | 10.6 | 259.6 |
| Dec. | 11.3 | 13.8 | 13.8 | 17.3 | 9.6 | 10.9 | 18.1 | 12.2 | 7.9 | 8.2 | 9.6 | 5.9 | 7.0 | 8.2 | 9.0 | 8.6 | 7.0 | 7.1 | 5.9 | 9.4 | 9.2 | 10.6 | 9.4 | 10.7 | 240.7 |
| Annual | 95.2 | 75.2 | 76.2 | 89.2 | 76.1 | 80.4 | 77.9 | 62.2 | 59.1 | 48.3 | 55.6 | 67.0 | 70.6 | 63.6 | 64.4 | 64.2 | 64.8 | 60.2 | 84.9 | 69.4 | 70.1 | 63.9 | 68.9 | 86.7 | 1694.1 |

RAINFALL

Monthly and annual totals of durations in sixty-minute periods between exact hours, G.M.T.

81 ESKDALEMUIR: $h_r = 242.0$ m. + 0.4 m.

| | Hour G.M.T. | | | | | | | | | | | | | | | | | | | | | | | | 0-24 |
|--------|-------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | |
| | hours | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | 9.0 | 7.5 | 7.7 | 5.9 | 6.6 | 8.0 | 6.3 | 5.5 | 7.9 | 6.1 | 4.5 | 6.9 | 8.4 | 6.2 | 5.3 | 6.4 | 7.6 | 6.2 | 6.6 | 7.6 | 8.1 | 6.0 | 7.2 | 9.5 | 167.0 |
| Feb. | 4.7 | 8.2 | 8.1 | 6.9 | 7.4 | 5.2 | 5.1 | 3.9 | 5.0 | 4.2 | 4.9 | 6.7 | 6.4 | 5.2 | 5.4 | 3.9 | 5.3 | 5.2 | 5.5 | 4.6 | 2.6 | 2.1 | 3.0 | 3.5 | 123.0 |
| Mar. | 5.7 | 6.0 | 7.3 | 6.2 | 6.4 | 6.4 | 5.1 | 7.2 | 6.1 | 5.3 | 3.8 | 5.2 | 6.6 | 5.6 | 6.5 | 7.7 | 7.9 | 5.7 | 5.3 | 5.7 | 6.1 | 6.5 | 6.8 | 5.6 | 146.7 |
| Apr. | 3.6 | 2.7 | 2.2 | 1.3 | 1.3 | 1.6 | 2.7 | 2.8 | 2.4 | 2.6 | 3.4 | 3.8 | 3.9 | 3.1 | 3.3 | 4.1 | 4.6 | 4.4 | 6.6 | 4.3 | 3.4 | 2.8 | 3.3 | 2.7 | 76.9 |
| May | 2.0 | 2.5 | 3.0 | 3.3 | 3.3 | 5.1 | 4.0 | 3.6 | 2.6 | 2.0 | 3.0 | 5.0 | 4.3 | 3.2 | 1.1 | 1.5 | 1.6 | 2.6 | 1.9 | 0.5 | 0.1 | 1.2 | 1.3 | 2.7 | 61.4 |
| June | 2.3 | 3.7 | 4.3 | 3.1 | 4.0 | 4.1 | 2.0 | 1.5 | 1.3 | 0.3 | 0.1 | 1.3 | 0.8 | 2.7 | 1.4 | 3.2 | 2.4 | 1.4 | 1.1 | 3.5 | 3.2 | 3.5 | 4.0 | 2.2 | 57.4 |
| July | 7.9 | 7.9 | 6.3 | 7.1 | 6.8 | 5.8 | 4.6 | 4.0 | 4.5 | 2.0 | 2.2 | 2.8 | 1.4 | 1.8 | 3.9 | 4.0 | 2.7 | 4.3 | 3.7 | 5.1 | 6.5 | 7.4 | 6.7 | 5.5 | 114.9 |
| Aug. | 6.3 | 7.3 | 4.1 | 5.2 | 4.8 | 5.8 | 3.6 | 4.3 | 4.0 | 3.6 | 4.2 | 5.2 | 3.0 | 2.6 | 4.6 | 4.4 | 6.2 | 7.2 | 5.0 | 4.1 | 5.1 | 5.9 | 8.0 | 8.0 | 122.5 |
| Sept. | 6.4 | 7.6 | 6.2 | 5.4 | 4.6 | 3.5 | 3.4 | 3.5 | 3.1 | 2.6 | 3.9 | 3.3 | 3.0 | 2.8 | 3.5 | 2.4 | 3.0 | 2.5 | 4.7 | 2.8 | 4.4 | 4.1 | 6.5 | 7.0 | 100.2 |
| Oct. | 1.0 | 1.3 | 1.5 | 1.0 | 1.6 | 1.9 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 0.6 | 1.0 | 0.9 | ... | 1.5 | 1.8 | 1.1 | 1.3 | 1.6 | 2.5 | 2.0 | 2.0 | 1.0 | 30.5 |
| Nov. | 6.8 | 6.8 | 9.0 | 8.3 | 11.4 | 12.1 | 13.7 | 11.4 | 12.1 | 8.7 | 6.8 | 6.1 | 7.0 | 5.3 | 3.6 | 4.1 | 4.8 | 7.4 | 8.0 | 5.7 | 6.7 | 7.7 | 5.4 | 5.6 | 184.5 |
| Dec. | 8.1 | 9.6 | 9.1 | 12.4 | 9.6 | 7.9 | 10.0 | 8.2 | 6.7 | 5.5 | 7.6 | 5.9 | 5.8 | 5.6 | 6.6 | 7.0 | 7.2 | 7.0 | 5.6 | 9.9 | 9.4 | 8.7 | 10.1 | 10.3 | 193.8 |
| Annual | 63.8 | 71.1 | 68.8 | 66.1 | 67.8 | 67.4 | 61.5 | 56.9 | 56.7 | 43.9 | 45.3 | 52.8 | 51.6 | 45.0 | 45.2 | 50.2 | 55.1 | 55.0 | 55.3 | 55.4 | 58.1 | 57.9 | 64.3 | 63.6 | 1378.8 |

NOTES ON RAINFALL

82 ESKDALEMUIR

Dry Periods

The following definitions are adopted by the British Rainfall Organization

- An "absolute drought" is a period of at least 15 consecutive days to none of which is credited 0.2 mm. of rain or more
- A "partial drought" is a period of at least 29 consecutive days, the mean daily rainfall of which does not exceed 0.2 mm.
- A "dry spell" is a period of at least 15 consecutive days to none of which is credited 1.0 mm. of rain or more
- "Absolute drought" No occasions
- "Partial drought" No occasions
- "Dry spell" No occasions

Wet Periods

The following definitions are adopted by the British Rainfall Organization

- A "rain spell" is a period of at least 15 consecutive days to each of which is credited 0.2 mm. of rain or more
- A "wet spell" is a period of at least 15 consecutive days to each of which is credited 1.0 mm. of rain or more
- "Rain spell" August 15 - September 6 and November 23 - December 9
- "Wet spell" August 17 - September 5

Rainfall Duration

There were 116 days on which no duration of rainfall was registered. The day with the greatest duration was March 22, when the duration was 23.8 hr., the amount falling being 29.9 mm. The longest continuous fall, 35.4 hr., occurred on March 21-22, 44.0 mm. being recorded.

| Hours | 0.1-1.0 | 1.1-2.0 | 2.1-6.0 | 6.1-12.0 | >12.0 |
|----------------|---------|---------|---------|----------|-------|
| Number of days | 57 | 22 | 76 | 64 | 30 |

Notable Falls of the Year

The greatest amount in a 60-minute period was 10.2 mm. which was recorded between 18h. and 19h. on August 21. Falls of 5 mm. in 1 hr. or less occurred on 8 days.

Details of the greatest continuous falls are as follows

| | January 16-17 | March 21-22 |
|----------------------------|---------------|-------------|
| Amount (mm.) | 30.6 | 44.0 |
| Duration of rainfall (hr.) | 11.0 | 35.4 |

Rate of Rainfall (Jardi Recorder)

The highest instantaneous rate of rainfall was 66 mm./hr. at 18h.40m. on September 25. The maximum rate exceeded 50 mm./hr. on July 8.

WIND

Mean speed and highest instantaneous speed recorded each day (0h. to 24h., G.M.T.) by the pressure-tube anemograph

85 ESKDALEMUIR: h_a (height of anemograph above M.S.L.) = height of ground above M.S.L. + height of anemograph above ground = 235 m. + 15 m.

Table with 12 columns for months (JANUARY to DECEMBER) and 2 rows for Mean and Max. gust. Each month's data is organized in pairs of columns (Mean, Max. gust) and includes a 'metres per second' label at the top of the data rows.

WIND

Monthly and annual means of mean wind speed between exact hours, G.M.T.

86 ESKDALEMUIR: $h_a = 235$ m. + 15 m.

Table showing hourly and annual means of wind speed. Columns include hour G.M.T. (0-1 to 24) and a final 'Mean' column. The data is presented in 'metres per second'.

DISTRIBUTION OF WIND SPEED, EXTREME VELOCITIES AS RECORDED BY PRESSURE-TUBE ANEMOGRAPH

87 ESKDALEMUIR: $h_a = 235$ m. + 15 m.

Table detailing wind speed distribution and extreme velocities. It is divided into 'DISTRIBUTION OF WIND SPEED' and 'EXTREME VELOCITIES' with sub-headers for 'Highest hourly wind' and 'Highest gust'. Includes columns for dates, durations, and speeds.

POTENTIAL GRADIENT (reduced to level surface)
Mean values for periods of sixty minutes between exact hours, G.M.T.

90 ESKDALEMUIR

| | JANUARY, factor 5.54 | | | | FEBRUARY, factor 5.52 | | | | MARCH, factor 5.56 | | | |
|------|------------------------|-------|---------|---------|-----------------------|-------|---------|---------|--------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 235 | Z+ | Z+ | Z+ | 285 | 430 | 130 | 245 | - | - | - | - |
| 2 | 475 | 370 | 435 | Z± | Z- | 135 | 50 | 195 | - | - | - | - |
| 3 | Z+ | 210 | 350 | 500 | Z- | 225 | 235 | 460 | - | - | - | - |
| 4 | Z± | Z- | Z- | - | Z+ | Z- | 140 | 360 | - | - | - | - |
| 5 | 295 | Z- | Z- | 420 | 80 | Z- | -30 | Z- | - | - | 180 | 310 |
| 6 | 290 | 515 | Z+ | - | Z+ | 210 | Z- | 315 | 145 | 160 | 135 | 385 |
| 7 | -65 | 305 | 320 | Z- | 285 | 200 | 255 | Z+ | 15 | 445 | Z+ | 215 |
| 8 | 245 | 370 | 285 | Z+ | 335 | Z- | 565 | 410 | 200 | 200 | 150 | 140 |
| 9 | 575 | 565 | 270 | Z+ | 445 | 195 | 465 | 465 | 85 | 115 | 215 | 190 |
| 10 | Z+ | Z- | 95 | 430 | 440 | 300 | 240 | 290 | 130 | Z+ | 170 | 405 |
| 11 | Z- | Z- | 160 | 195 | 40 | 305 | 340 | 175 | 205 | 235 | 240 | 370 |
| 12 | 80 | Z± | - | - | -35 | 110 | 300 | 65 | 225 | 235 | 225 | 505 |
| 13 | - | - | 350 | 400 | 70 | 185 | 165 | 545 | 385 | Z+ | 225 | 275 |
| 14 | 50 | 125 | 200 | Z± | 195 | 180 | 280 | 405 | Z± | 10 | 25 | 170 |
| 15 | 140 | Z+ | Z+ | 280 | 155 | 130 | 80 | 60 | 100 | 160 | 155 | 225 |
| 16 | 300 | 220 | 110 | 510 | 130 | 415 | 30 | 130 | 80 | 180 | 265 | 360 |
| 17 | Z- | Z- | 60 | Z- | Z- | 100 | 50 | Z± | 55 | 260 | 390 | Z- |
| 18 | 35 | 95 | 150 | 150 | - | - | - | - | Z± | 95 | 20 | 180 |
| 19 | 90 | 55 | 100 | 195 | - | - | - | - | 90 | 205 | 250 | 455 |
| 20 | 50 | 100 | 130 | 195 | - | - | - | - | 165 | 125 | 295 | 265 |
| 21 | 190 | 320 | 195 | 190 | - | - | - | - | 290 | 310 | Z± | 5 |
| 22 | 45 | 85 | 145 | 315 | - | - | - | - | -70 | Z- | -40 | Z- |
| 23 | 115 | 310 | 195 | 405 | - | - | - | - | 45 | 120 | 180 | 180 |
| 24 | 405 | 410 | 320 | 415 | - | - | - | - | 155 | Z± | 250 | 340 |
| 25 | 130 | 150 | 125 | 75 | - | - | - | - | 225 | 155 | Z± | 430 |
| 26 | -75 | Z- | 235 | Z- | - | - | - | - | 275 | 240 | Z+ | 200 |
| 27 | 260 | 475 | 325 | 345 | - | - | - | - | Z+ | 160 | - | - |
| 28 | 215 | 160 | Z+ | Z+ | - | - | - | - | - | 255 | 220 | Z± |
| 29 | 570 | 330 | 370 | Z+ | - | - | - | - | 190 | 310 | 140 | 155 |
| 30 | 355 | 325 | -160 | Z- | - | - | - | - | 100 | 135 | Z- | 410 |
| 31 | 10 | 195 | 240 | Z- | - | - | - | - | Z± | Z- | Z- | 485 |
| (a) | 224 | 271 | 225 | 314 | 224 | 223 | 222 | 294 | 158 | 196 | 196 | 289 |
| (b) | 162 | 222 | 179 | 279 | 192 | 250 | 226 | 264 | 139 | 186 | 205 | 294 |
| Mean | (a) 259 | | (b) 211 | | (a) 241 | | (b) 233 | | (a) 210 | | (b) 206 | |

| | APRIL, factor 5.49 | | | | MAY, factor 5.33 | | | | JUNE, factor 5.03 | | | |
|------|------------------------|-------|---------|---------|------------------|-------|---------|---------|-------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 355 | Z± | 120 | 125 | 65 | Z± | Z± | 130 | 590 | 210 | 170 | 235 |
| 2 | 325 | 430 | 220 | 235 | 335 | 135 | 145 | 200 | 260 | 210 | 140 | 120 |
| 3 | 275 | 240 | 125 | Z- | 285 | 205 | 115 | 180 | 85 | 135 | 135 | 105 |
| 4 | -125 | 110 | Z± | 185 | 245 | 185 | 80 | 160 | 65 | 180 | 200 | 220 |
| 5 | 110 | 95 | - | - | 110 | 20 | 100 | 65 | 170 | 140 | 170 | 235 |
| 6 | - | - | 205 | Z- | 80 | 80 | 110 | 225 | 155 | 145 | 170 | 140 |
| 7 | 135 | 30 | 0 | 250 | 155 | 145 | 145 | 170 | Z± | 115 | 215 | 215 |
| 8 | 160 | 175 | 225 | 255 | 185 | 200 | Z- | Z- | 115 | 170 | 225 | 335 |
| 9 | 275 | 225 | 285 | Z± | 70 | 40 | 30 | 160 | 245 | 175 | 160 | 30 |
| 10 | 110 | 245 | 250 | 300 | 150 | 150 | 190 | 300 | - | - | - | - |
| 11 | 360 | 350 | -65 | Z- | 300 | 180 | 175 | 145 | - | - | 205 | Z- |
| 12 | Z- | 135 | 205 | 155 | 175 | 245 | 180 | 270 | 590 | 435 | 130 | 190 |
| 13 | 130 | 145 | 270 | 360 | 245 | 160 | 150 | 115 | 205 | 200 | Z- | 395 |
| 14 | 295 | 215 | 260 | 40 | 95 | 210 | 145 | 180 | 160 | 220 | 170 | 160 |
| 15 | 190 | Z- | Z- | Z- | 335 | 310 | 175 | 360 | 45 | 240 | 140 | 185 |
| 16 | 125 | 225 | Z- | 160 | 285 | 165 | 215 | 265 | Z+ | 200 | 155 | 160 |
| 17 | 115 | 230 | 245 | 295 | 195 | 175 | 260 | 370 | Z± | Z± | Z± | 110 |
| 18 | 125 | 80 | 25 | 470 | 170 | 195 | 110 | 175 | - | 140 | 10 | Z- |
| 19 | 145 | 150 | 135 | 170 | 145 | 125 | 85 | 165 | - | 110 | 75 | 255 |
| 20 | 150 | 145 | 280 | 115 | 380 | Z± | - | - | Z± | 100 | 120 | Z- |
| 21 | 100 | 120 | 235 | 280 | - | - | 40 | 300 | Z- | 310 | 170 | 150 |
| 22 | 225 | 195 | 285 | 295 | 225 | 95 | 125 | 240 | 65 | 190 | 110 | 175 |
| 23 | 140 | 195 | 90 | 115 | 135 | 140 | 145 | 245 | 170 | 175 | 140 | 195 |
| 24 | 455 | 505 | 195 | 190 | 195 | Z+ | Z- | 240 | 160 | 155 | 160 | 160 |
| 25 | 250 | 150 | 150 | 50 | 125 | -140 | 140 | 110 | 140 | 305 | Z± | 115 |
| 26 | 40 | 150 | Z+ | 125 | 450 | 430 | 240 | 375 | 105 | 295 | 95 | 170 |
| 27 | 190 | 220 | 220 | 140 | Z± | 0 | 135 | 165 | 60 | 40 | 30 | 85 |
| 28 | 90 | 135 | 180 | 225 | 235 | Z- | 225 | 255 | 105 | 95 | 110 | 160 |
| 29 | 180 | 155 | 125 | 110 | 265 | 190 | 275 | 325 | 25 | 110 | 110 | 135 |
| 30 | 100 | 115 | 120 | 110 | 150 | 155 | 205 | 250 | 190 | 290 | 155 | 310 |
| 31 | | | | | 375 | 250 | 295 | 615 | | | | |
| (a) | 191 | 191 | 185 | 198 | 212 | 167 | 156 | 233 | 176 | 189 | 141 | 183 |
| (b) | 180 | 191 | 185 | 211 | 213 | 160 | 160 | 236 | 177 | 190 | 143 | 176 |
| Mean | (a) 191 | | (b) 192 | | (a) 192 | | (b) 192 | | (a) 172 | | (b) 171 | |

The potential gradient is reckoned as positive if the potential increases upwards. For indeterminate potential gradient the following notation is used: Z+, indeterminate, positive value; Z-, indeterminate, negative value; Z±, indeterminate, in magnitude and sign.

(a) Mean of all positive readings

(b) Mean from all complete days using both positive and negative readings.

POTENTIAL GRADIENT (reduced to level surface)
 Mean values for periods of sixty minutes between exact hours, G.M.T.

90 ESKDALEMUIR

| | JULY, factor 4.62 | | | | AUGUST, factor 4.43 | | | | SEPTEMBER, factor 4.70 | | | |
|------|------------------------|-------|---------|---------|---------------------|-------|---------|---------|------------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 130 | - | 105 | 140 | 215 | 195 | 155 | 295 | 210 | 195 | 210 | Z- |
| 2 | 40 | 190 | 80 | 125 | 435 | 295 | 135 | -50 | Z+ | 275 | 140 | 135 |
| 3 | -145 | 260 | 420 | 400 | -65 | Z+ | 215 | 320 | 75 | 205 | 140 | - |
| 4 | 50 | 10 | 200 | 200 | 425 | 260 | 185 | 415 | 220 | 355 | 165 | Z- |
| 5 | 150 | 425 | 180 | 5 | 500 | Z | 165 | 135 | 225 | 180 | 165 | 305 |
| 6 | 250 | 140 | 140 | 310 | 135 | 155 | 255 | 200 | 455 | 155 | 210 | 335 |
| 7 | 290 | 275 | 210 | 65 | 180 | 60 | 30 | 260 | 130 | 180 | 60 | 335 |
| 8 | - | - | Z± | 395 | 140 | 165 | Z± | 75 | 195 | 315 | 280 | 220 |
| 9 | 430 | 210 | 150 | 140 | -10 | 160 | 145 | 245 | 65 | 210 | - | 215 |
| 10 | -55 | Z+ | 245 | 200 | 185 | 235 | 175 | 235 | - | - | - | 235 |
| 11 | 295 | -180 | 275 | 260 | 125 | 175 | 190 | 150 | - | - | 175 | 120 |
| 12 | 210 | 115 | 265 | 220 | 150 | 105 | 10 | Z- | 45 | 160 | 275 | 295 |
| 13 | 45 | 175 | 95 | 315 | 95 | 150 | 85 | 05 | 0 | -45 | Z± | 100 |
| 14 | 195 | 210 | 120 | 155 | 355 | 180 | 315 | 525 | 85 | 155 | Z- | Z± |
| 15 | 170 | 245 | 185 | 250 | 195 | 260 | 70 | Z+ | Z- | 275 | 240 | 175 |
| 16 | 130 | 215 | 205 | 190 | 260 | 105 | 125 | 245 | 135 | 120 | 145 | 255 |
| 17 | 235 | 230 | 150 | 210 | Z- | 110 | 215 | 285 | 155 | 155 | 125 | 140 |
| 18 | 145 | 180 | 285 | 530 | 310 | 350 | 145 | Z- | 75 | 90 | 185 | 295 |
| 19 | 255 | 45 | 70 | 360 | 165 | 185 | Z± | Z- | 110 | 165 | 200 | 140 |
| 20 | 160 | 125 | 230 | 455 | 285 | 205 | 135 | 215 | 75 | 175 | 240 | 350 |
| 21 | 110 | 210 | 195 | 270 | - | - | - | - | 130 | 170 | 175 | 215 |
| 22 | 80 | 125 | Z- | Z± | - | - | - | - | 130 | 195 | 240 | 180 |
| 23 | 350 | 235 | 25 | 370 | 95 | 120 | 165 | -270 | 30 | 195 | 45 | 255 |
| 24 | 415 | 240 | 215 | 525 | 185 | 290 | 125 | 165 | 35 | Z- | Z± | Z- |
| 25 | 330 | 200 | 155 | 365 | 255 | 90 | Z- | 220 | Z- | Z+ | 270 | 175 |
| 26 | 285 | 85 | 210 | 210 | Z± | 280 | Z- | - | 75 | Z+ | Z- | 110 |
| 27 | 150 | 240 | 260 | 325 | - | - | Z- | 290 | 80 | 115 | 175 | Z+ |
| 28 | 135 | 245 | 170 | 340 | Z- | 385 | 110 | Z- | 305 | 145 | 295 | 105 |
| 29 | 335 | 170 | 140 | 300 | Z± | Z- | - | - | 170 | 190 | 270 | 125 |
| 30 | 180 | 140 | 210 | 230 | - | - | 130 | 135 | - | - | - | - |
| 31 | 300 | 175 | 105 | 280 | 65 | 110 | 270 | 270 | - | - | - | - |
| (a) | 209 | 189 | 183 | 271 | 226 | 193 | 154 | 234 | 134 | 190 | 192 | 209 |
| (b) | 204 | 178 | 183 | 274 | 202 | 180 | 166 | 194 | 158 | 173 | 194 | 237 |
| Mean | (a) 213 | | (b) 210 | | (a) 202 | | (b) 185 | | (a) 181 | | (b) 191 | |

| | OCTOBER, factor 4.79 | | | | NOVEMBER, factor 4.82 | | | | DECEMBER, factor 4.73 | | | |
|------|------------------------|-------|---------|---------|-----------------------|-------|---------|---------|-----------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | - | - | 145 | 165 | 160 | 235 | 410 | 285 | Z+ | 95 | 155 | Z+ |
| 2 | 130 | 165 | 165 | 195 | 45 | 50 | 210 | Z+ | 95 | 170 | 165 | 185 |
| 3 | 135 | 125 | 105 | 235 | 135 | 210 | Z- | 375 | 170 | Z- | Z- | 105 |
| 4 | 205 | 210 | 170 | 50 | 305 | Z- | Z- | Z- | 55 | 90 | 60 | 50 |
| 5 | Z+ | 210 | 205 | 265 | Z- | Z- | Z- | 60 | 55 | 70 | 105 | Z- |
| 6 | 50 | 70 | 180 | 100 | -60 | 5 | 70 | 30 | 110 | 170 | Z- | 350 |
| 7 | - | - | 215 | 250 | 55 | 65 | 100 | 80 | 185 | 255 | Z- | Z- |
| 8 | 80 | 195 | 250 | 420 | 40 | 115 | 40 | 25 | Z- | Z- | 90 | 150 |
| 9 | 125 | 340 | 225 | 375 | 5 | 40 | 160 | 135 | 60 | 145 | 185 | 270 |
| 10 | 335 | 205 | 100 | 130 | Z- | -445 | 170 | 190 | Z+ | 220 | 490 | 480 |
| 11 | - | 165 | 335 | 45 | Z- | 40 | 190 | 15 | 140 | 120 | 215 | 365 |
| 12 | - | 360 | 375 | 310 | 310 | 70 | 85 | 105 | 175 | 125 | 125 | 185 |
| 13 | 305 | 295 | 205 | -10 | 100 | 150 | 55 | 80 | 355 | 260 | 320 | 480 |
| 14 | - | - | 220 | - | 105 | Z- | 220 | 210 | 280 | 60 | 165 | 55 |
| 15 | - | 200 | 230 | 265 | -270 | Z± | 130 | 175 | 80 | 65 | 190 | 390 |
| 16 | 275 | 450 | 590 | 180 | 95 | Z- | Z± | Z- | 255 | 240 | 250 | 175 |
| 17 | 65 | 200 | 180 | 215 | Z- | Z± | Z- | Z- | 280 | 140 | 230 | 200 |
| 18 | 85 | 95 | - | - | 140 | 130 | 180 | 405 | Z- | Z- | 175 | 215 |
| 19 | - | - | 250 | 160 | Z- | Z- | 110 | Z- | 115 | Z- | Z- | Z- |
| 20 | Z- | 205 | Z- | 125 | 170 | Z- | 15 | Z- | Z- | 105 | 420 | 475 |
| 21 | 85 | 125 | 225 | Z± | 110 | 100 | 85 | 85 | 95 | 170 | 300 | 175 |
| 22 | 170 | 185 | 300 | 355 | 85 | 90 | 200 | 120 | -255 | 90 | 160 | 190 |
| 23 | 270 | 240 | Z- | Z+ | 55 | 60 | 130 | Z- | 220 | 185 | 55 | 115 |
| 24 | Z+ | Z+ | 215 | 285 | 15 | 110 | 90 | Z- | 195 | 200 | Z+ | Z- |
| 25 | 230 | 150 | 300 | 525 | 20 | 120 | 375 | 210 | Z- | 05 | 160 | 405 |
| 26 | 375 | 415 | 345 | Z+ | 150 | 160 | 140 | 145 | 125 | 260 | 415 | 325 |
| 27 | 265 | 260 | 340 | 360 | 50 | 140 | 100 | Z- | Z± | 180 | Z± | - |
| 28 | 150 | 170 | 230 | 455 | Z± | Z± | 155 | 240 | Z+ | Z- | 205 | 330 |
| 29 | 370 | 340 | 290 | 530 | Z+ | 95 | 180 | 160 | 110 | 195 | 165 | 360 |
| 30 | 180 | 130 | 325 | Z- | 85 | 100 | 110 | 100 | 150 | 100 | Z+ | - |
| 31 | 220 | 210 | 440 | Z+ | - | - | - | - | Z- | Z+ | Z+ | 360 |
| (a) | 195 | 220 | 256 | 261 | 94 | 104 | 148 | 154 | 157 | 149 | 209 | 266 |
| (b) | 193 | 224 | 242 | 274 | 72 | 106 | 155 | 139 | 138 | 154 | 200 | 235 |
| Mean | (a) 233 | | (b) 233 | | (a) 125 | | (b) 118 | | (a) 195 | | (b) 182 | |

The factor used for converting the potential at the collector to potential gradient in volts per metre in the open is given for each month.

| | | | | | |
|--------------|---------|-----|---------|-----|-----|
| Annual means | (a) | 183 | 190 | 189 | 242 |
| | (b) | 169 | 185 | 187 | 234 |
| | (a) 201 | | (b) 194 | | |

POTENTIAL GRADIENT (reduced to level surface): DIURNAL INEQUALITIES
The departures from the mean of the day are adjusted for non-cyclic change†

91 ESKDALEMUIR

| | Hour G.M.T. | | | | | | | | | | | | | | | | | | | | | | | | Non-cyclic change† | No. of days used | Mean | | | | | | | | |
|---------|----------------------|------|------|------|------|------|------|-----|-----|------|------|------|------|-----|-----|------|------|------|------|------|------|-----|------|-----|--------------------|------------------|-------|----|----|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | volts per metre | | | | | | | | | | | | | | | | | | | | | | | | | | v./m. | | | | | | | | |
| | 0a days only* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | -60 | -47 | -52 | -50 | -39 | -22 | -1 | +14 | +50 | +78 | +55 | +5 | +22 | -62 | -14 | +58 | +67 | +45 | +21 | +24 | +32 | +4 | -44 | -77 | -92 | 3 | 281 | | | | | | | | |
| Feb. | +51 | -85 | -26 | -59 | -136 | -67 | -50 | -46 | -38 | +9 | -8 | -55 | -82 | -55 | -21 | +13 | +98 | +113 | +55 | +84 | +67 | +80 | +82 | +80 | -287 | 2 | 210 | | | | | | | | |
| Mar. | +36 | -41 | -76 | -94 | -93 | -86 | -89 | -67 | -45 | -60 | -11 | -15 | -28 | -14 | -5 | +1 | +11 | +97 | +145 | +93 | +103 | +86 | +64 | +80 | -76 | 5 | 225 | | | | | | | | |
| Apr. | -22 | -11 | -34 | -36 | -22 | +3 | +15 | +61 | +24 | +16 | -9 | -18 | -32 | -24 | -16 | -6 | -7 | +17 | +14 | +24 | 0 | +8 | +51 | -5 | -37 | 6 | 253 | | | | | | | | |
| May | +20 | +12 | +11 | -11 | -22 | -16 | 0 | -17 | -18 | -16 | -26 | -27 | -26 | -32 | -27 | -30 | -17 | -12 | +19 | +40 | +33 | +64 | +61 | +25 | +11 | 14 | 192 | | | | | | | | |
| June | +5 | +3 | +7 | +7 | +6 | -10 | +1 | +21 | +11 | +8 | -7 | -24 | -42 | -32 | -33 | -16 | +12 | 0 | +6 | +18 | +31 | +22 | +2 | +8 | -48 | 12 | 190 | | | | | | | | |
| July | +20 | -5 | +4 | -1 | +2 | +18 | +4 | -20 | -13 | -14 | -28 | -28 | -12 | -22 | -37 | -39 | -9 | -10 | +4 | +48 | +38 | +36 | +46 | +16 | -18 | 7 | 203 | | | | | | | | |
| Aug. | -64 | -52 | +168 | +208 | +74 | +59 | -13 | -15 | -76 | -158 | -88 | -84 | -79 | -38 | -8 | -5 | -16 | -37 | -12 | -2 | +130 | +33 | +61 | +10 | +278 | 1 | 295 | | | | | | | | |
| Sept. | -40 | -32 | -52 | -60 | -49 | -42 | +34 | +33 | -8 | +20 | +34 | +24 | +32 | +40 | +36 | +20 | +26 | +12 | -7 | +25 | +40 | +1 | -45 | -36 | -9 | 7 | 169 | | | | | | | | |
| Oct. | -2 | -56 | -77 | -55 | -47 | -35 | -33 | -26 | -26 | -13 | 0 | +15 | -19 | +3 | +3 | +4 | +34 | +27 | +24 | +64 | +89 | +87 | +55 | +17 | +49 | 9 | 257 | | | | | | | | |
| Nov. | -48 | -61 | -40 | -32 | -58 | -30 | -36 | -29 | -35 | -10 | -9 | +12 | +100 | +70 | +73 | +53 | +28 | +59 | +52 | +50 | -11 | -28 | -29 | -34 | +5 | 1 | 128 | | | | | | | | |
| Dec. | +31 | -11 | -23 | -18 | -79 | -76 | -110 | -95 | -88 | -88 | -14 | +47 | +50 | +46 | -16 | -36 | -40 | -19 | +76 | +69 | +132 | +68 | +109 | +79 | +25 | 2 | 281 | | | | | | | | |
| Year | -6 | -32 | -16 | -17 | -39 | -25 | -23 | -15 | -22 | -19 | -9 | -15 | -10 | -10 | -5 | +1 | +16 | +24 | +33 | +45 | +57 | +38 | +34 | +14 | - | - | 224 | | | | | | | | |
| Winter | -7 | -51 | -35 | -40 | -78 | -49 | -49 | -39 | -28 | -3 | +6 | +2 | +23 | 0 | +5 | +22 | +38 | +49 | +51 | +57 | +55 | +31 | +29 | +12 | - | - | 225 | | | | | | | | |
| Equinox | -7 | -35 | -60 | -61 | -53 | -40 | -18 | 0 | -14 | -9 | +3 | -6 | -12 | +1 | +5 | +5 | +16 | +38 | +44 | +51 | +58 | +45 | +31 | +14 | - | - | 226 | | | | | | | | |
| Summer | -5 | -11 | +47 | +51 | +15 | +13 | -2 | -8 | -24 | -45 | -37 | -41 | -40 | -31 | -26 | -20 | -7 | -15 | +4 | +26 | +58 | +39 | +43 | +15 | - | - | 220 | | | | | | | | |
| | 1a and 2a days only* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | -24 | -44 | -28 | -44 | -48 | -78 | -39 | +19 | +7 | -49 | -52 | +81 | +65 | +5 | -22 | 0 | +57 | +141 | +74 | +69 | +16 | -2 | -72 | -34 | +50 | 3 | 158 | | | | | | | | |
| Feb. | -96 | -134 | -165 | -171 | -293 | -325 | -232 | -66 | +30 | +120 | +114 | +128 | -48 | +37 | +48 | +91 | +115 | +134 | +115 | +164 | +166 | +83 | +123 | +70 | -36 | 2 | 207 | | | | | | | | |
| Mar. | +55 | -110 | -87 | -72 | -77 | -51 | -17 | -47 | -45 | +23 | +59 | +46 | +5 | +29 | +68 | -58 | +45 | +36 | +103 | +84 | +50 | +23 | +45 | 0 | -40 | 1 | 154 | | | | | | | | |
| Apr. | +43 | -12 | -26 | -55 | -45 | -1 | +11 | -1 | +20 | -2 | -7 | -24 | -10 | -28 | +15 | +8 | -8 | +20 | +52 | +20 | -32 | +2 | +15 | +34 | +65 | 3 | 184 | | | | | | | | |
| May | +18 | +6 | +27 | -21 | 0 | -28 | +8 | -25 | -26 | -22 | -12 | -38 | -43 | -31 | -16 | -10 | +17 | +1 | +11 | +30 | +50 | +46 | +35 | +33 | -23 | 5 | 144 | | | | | | | | |
| June | +6 | -30 | -52 | -3 | +3 | +41 | +38 | -3 | -11 | +2 | +18 | +14 | +5 | -12 | -21 | -6 | -2 | +1 | -16 | -22 | +20 | +14 | -3 | +10 | -44 | 3 | 129 | | | | | | | | |
| July | +6 | -6 | -2 | -50 | -28 | -6 | +2 | +20 | -14 | -27 | -82 | -45 | -49 | -46 | -31 | +10 | +31 | +40 | +26 | +48 | +67 | +79 | +28 | +34 | -57 | 8 | 192 | | | | | | | | |
| Aug. | +3 | +10 | +56 | +62 | +79 | +69 | +128 | +72 | +46 | +35 | +10 | -21 | -24 | -49 | -60 | -119 | -81 | -126 | -104 | -18 | +44 | +21 | -2 | -30 | +26 | 3 | 219 | | | | | | | | |
| Sept. | -10 | +61 | +200 | +102 | -4 | -129 | -80 | -93 | -95 | -21 | -29 | -55 | -39 | -31 | -30 | -14 | +2 | +91 | +42 | +39 | +102 | +49 | -16 | -34 | -31 | 1 | 244 | | | | | | | | |
| Oct. | +59 | +35 | +2 | +12 | +4 | -34 | -30 | -7 | +6 | -24 | -53 | -71 | -33 | -3 | -8 | +12 | -20 | -7 | -36 | -58 | +60 | +65 | +101 | +22 | -166 | 5 | 244 | | | | | | | | |
| Nov. | +11 | -25 | -50 | -46 | -27 | -31 | -58 | -62 | -15 | +12 | +56 | +56 | +76 | +37 | +13 | -21 | -56 | +59 | +31 | +13 | +29 | -30 | +21 | +2 | -89 | 2 | 116 | | | | | | | | |
| Dec. | -24 | +1 | +11 | -4 | -25 | -28 | -33 | -21 | -77 | -58 | -41 | -18 | +4 | +30 | +24 | +31 | +10 | +25 | -19 | +41 | +74 | +12 | +44 | +37 | -78 | 4 | 162 | | | | | | | | |
| Year | +4 | -21 | -9 | -24 | -38 | -50 | -25 | -18 | -15 | -1 | -2 | +4 | -8 | -5 | -2 | -6 | +9 | +34 | +23 | +34 | +54 | +30 | +27 | +12 | - | - | 179 | | | | | | | | |
| Winter | -33 | -51 | -58 | -66 | -98 | -115 | -91 | -33 | -14 | +6 | +19 | +62 | +24 | +27 | +16 | +25 | +31 | +90 | +50 | +72 | +71 | +16 | +29 | +19 | - | - | 161 | | | | | | | | |
| Equinox | +38 | -7 | +22 | -3 | -31 | -54 | -29 | -37 | -29 | -6 | -7 | -26 | -19 | -8 | +11 | -13 | +5 | +35 | +40 | +21 | +45 | +35 | +36 | +5 | - | - | 207 | | | | | | | | |
| Summer | +8 | -5 | +7 | -3 | +13 | +19 | +44 | +16 | -1 | -3 | -17 | -23 | -28 | -35 | -32 | -31 | -9 | -21 | -21 | +9 | +45 | +40 | +15 | +12 | - | - | 171 | | | | | | | | |

Winter: January, February, November, December
Equinox: March, April, September, October
Summer: May to August

* For explanation of 0a, 1a, 2a days see p.90, *Observatories' Year Book, 1938.*

† See p.10, *Observatories' Year Book, 1938.*

ELECTRICAL CHARACTER OF EACH DAY AND APPROXIMATE DURATION OF NEGATIVE POTENTIAL GRADIENT

92 ESKDALEMUIR

| | JANUARY | | FEBRUARY | | MARCH | | APRIL | | MAY | | JUNE | |
|------------------|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|
| | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient |
| 1 | 0b | hr. ... | 2b | hr. 4.0 | 0a | hr. ... | 1c | hr. 2.9 | 2c | hr. 9.1 | 0a | hr. ... |
| 2 | 1c | 0.6 | 2c | 8.9 | 0a | ... | 0a | ... | 2c | 6.0 | 0a | ... |
| 3 | 1b | 0.1 | 2b | 3.3 | 1a | 0.4 | 2c | 7.8 | 0a | ... | 0a | ... |
| 4 | 2c | 4.4 | 2c | 5.6 | 1a | 1.2 | 2c | 4.6 | 1b | 2.9 | 0a | ... |
| 5 | 2c | 5.9 | 2c | 7.3 | 2a | 6.2 | (1b) | 0.1 | 0a | ... | 0a | ... |
| 6 | 2c | 4.3 | 1b | 2.9 | 2b | 1.1 | (1b) | 2.7 | 1a | 0.1 | 1a | 0.1 |
| 7 | 2c | 5.0 | 1c | 0.9 | 2c | 4.3 | 2b | 9.1 | 0a | ... | 1b | 0.7 |
| 8 | 1c | 2.6 | 2b | 3.0 | 0a | ... | 1b | 0.9 | 2c | 6.6 | 0a | ... |
| 9 | 1c | 0.1 | 0b | ... | 1a | 0.1 | 1b | 2.6 | 1a | 0.7 | 0a | ... |
| 10 | 2c | 5.8 | 0a | ... | 1b | 0.2 | 1a | 0.9 | 0a | ... | (1b) | - |
| 11 | 2c | 6.3 | 1a | 0.3 | 0a | ... | 2b | 5.8 | 0a | ... | (1b) | 2.4 |
| 12 | 2c | 6.2 | 2c | 4.3 | 0a | ... | 2c | 8.8 | 0a | ... | 0a | ... |
| 13 | (1c) | 0.3 | 2a | 3.3 | 2c | 4.4 | 1b | 0.8 | 1a | 0.1 | 1b | 0.9 |
| 14 | 1b | 1.3 | 0b | ... | 2c | 8.6 | 1b | 0.9 | 0a | ... | 1b | 0.9 |
| 15 | 0c | ... | 0a | ... | 0a | ... | 2c | 11.7 | 0a | ... | 0a | ... |
| 16 | 2b | 4.2 | 2c | 4.5 | 1b | 2.7 | 1c | 2.2 | 1a | 0.1 | 1b | 0.2 |
| 17 | 2c | 17.8 | 2c | 6.0 | 2b | 5.5 | 0a | ... | 0a | ... | 2c | 9.0 |
| 18 | 2b | 3.5 | 1a | 1.1 | 2b | 3.1 | 1b | 1.7 | 0a | ... | (2b) | 3.2 |
| 19 | 1a | 1.3 | 2b | 3.3 | 0b | ... | 0b | ... | 0a | ... | 1a | 0.3 |
| 20 | 1a | 0.1 | 1a | 2.2 | 0a | ... | 1a | 0.1 | 2c | 3.1 | 2b | 4.5 |
| 21 | 1a | 0.1 | 1b | 0.1 | 2c | 5.5 | 0a | ... | (1b) | 0.3 | 1b | 2.0 |
| 22 | 1b | 3.6 | 1a | 1.0 | 2c | 15.4 | 0a | ... | 0a | ... | 1a | 0.4 |
| 23 | 0b | ... | 1b | 1.4 | 1b | 1.2 | 1a | 0.3 | 1a | 0.2 | 0a | ... |
| 24 | 0a | ... | 1a | 0.2 | 1b | 0.5 | 0a | ... | 1b | 3.4 | 0a | ... |
| 25 | 0a | ... | 0a | ... | 1b | 0.5 | 1b | 0.8 | 1b | 0.9 | 2c | 3.6 |
| 26 | 1b | 2.0 | 1b | 1.4 | 0c | ... | 1c | 2.9 | 1b | 0.4 | 0a | ... |
| 27 | 0a | ... | 0a | ... | 0b | ... | 0a | ... | 2c | 7.1 | 1a | 0.8 |
| 28 | 0b | ... | 0a | ... | (1b) | 1.5 | 1b | 0.1 | 2b | 3.1 | 0a | ... |
| 29 | 0b | ... | 1b | 1.1 | 1b | 1.1 | 1b | 0.9 | 0a | ... | 2b | 4.1 |
| 30 | 2c | 12.7 | 2b | 3.2 | 2b | 3.2 | 1b | 1.8 | 0a | ... | 0a | ... |
| 31 | 2b | 4.1 | | | 2c | 8.6 | | | 0b | ... | | |
| Total | - | 92.3 | - | 65.0 | - | 75.3 | - | 70.4 | - | 44.1 | - | 33.1 |
| No. of days used | | 31 | | 28 | | 31 | | 30 | | 31 | | 29 |
| Mean | | 3.0 | | 2.3 | | 2.4 | | 2.3 | | 1.4 | | 1.1 |

| | JULY | | AUGUST | | SEPTEMBER | | OCTOBER | | NOVEMBER | | DECEMBER | |
|------------------|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|
| | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient |
| 1 | 0a | hr. ... | 1b | hr. 0.2 | 1b | hr. 1.3 | (0a) | hr. ... | 1b | hr. 0.1 | 1c | hr. 0.8 |
| 2 | 1a | 0.1 | 2c | 2.9 | 1b | 1.1 | 0a | ... | 1b | 0.6 | 1b | 0.8 |
| 3 | 1b | 1.3 | 2b | 3.7 | 1b | 0.7 | 0a | ... | 2c | 4.2 | 2c | 7.7 |
| 4 | 1b | 1.7 | 1a | 0.3 | 2b | 5.6 | 1a | 1.1 | 2c | 10.9 | 1b | 1.3 |
| 5 | 1a | 1.2 | 1b | 1.1 | 1b | 0.4 | 1b | 0.4 | 2c | 14.5 | 2c | 4.1 |
| 6 | 0a | ... | 1b | 0.1 | 1a | 0.7 | 0a | ... | 2c | 9.4 | 1b | 0.9 |
| 7 | 1b | 1.3 | 2b | 10.4 | 0b | ... | 0a | ... | 1a | 1.7 | 2b | 5.7 |
| 8 | (1b) | 2.0 | 1b | 2.3 | 1b | 0.2 | 0a | ... | 2b | 3.7 | 2c | 11.3 |
| 9 | 1b | 1.9 | 1b | 1.8 | (0a) | ... | 0a | ... | 2b | 3.1 | 1b | 1.5 |
| 10 | 1c | 2.8 | 1a | 0.1 | (1a) | 0.9 | 1a | 1.0 | 2c | 9.8 | 0b | ... |
| 11 | 2b | 3.0 | 1b | 1.6 | 0a | ... | 0a | ... | 2b | 8.5 | 0a | ... |
| 12 | 1a | 1.4 | 2c | 7.3 | 1b | 1.3 | 0a | ... | 2b | 3.2 | 1a | 0.8 |
| 13 | 1b | 2.5 | 1b | 3.5 | 2c | 4.9 | 1a | 2.3 | 1b | 0.3 | 0a | ... |
| 14 | 0a | ... | 0a | ... | 2c | 4.8 | 0a | ... | 1b | 2.5 | 1a | 0.6 |
| 15 | 0a | ... | 1b | 2.1 | 2b | 4.0 | 0a | ... | 2b | 5.2 | 1a | 0.7 |
| 16 | 0a | ... | 1b | 1.0 | 1b | 0.7 | 0b | ... | 2c | 7.6 | 1b | 1.5 |
| 17 | 0a | ... | 1c | 2.8 | 0a | ... | 0a | ... | 2c | 7.7 | 1a | 0.5 |
| 18 | 0b | ... | 2c | 5.5 | 0a | ... | (0a) | ... | 2c | 6.4 | 2c | 5.2 |
| 19 | 1a | 1.0 | 2c | 4.7 | 0a | ... | (0a) | ... | 2c | 9.4 | 2c | 12.5 |
| 20 | 0b | ... | 1b | 1.6 | 0a | ... | 1c | 2.7 | 2c | 11.9 | 1c | 2.3 |
| 21 | 0b | ... | (2b) | - | 0a | ... | 1b | 0.6 | 1b | 1.4 | 2b | 3.3 |
| 22 | 2c | 3.9 | (1b) | - | 0a | ... | 0a | ... | 0a | ... | 2b | 5.5 |
| 23 | 1b | 0.4 | 2b | 3.5 | 1b | 2.5 | 2c | 3.3 | 2b | 3.0 | 2b | 3.7 |
| 24 | 0b | ... | 1a | 1.9 | 2c | 10.3 | 0b | ... | 2c | 7.5 | 2c | 5.1 |
| 25 | 1a | 0.1 | 1b | 2.8 | 2c | 9.5 | 0a | ... | 1b | 2.3 | 2c | 5.7 |
| 26 | 1a | 0.3 | 2c | (4.9) | 1b | 1.7 | 0b | ... | 1a | 0.2 | 0b | ... |
| 27 | 1b | 0.5 | (1b) | (1.8) | 2c | 3.1 | 0a | ... | 1c | 2.5 | 2c | 12.4 |
| 28 | 1a | 0.1 | 1b | 2.5 | 1b | 0.2 | 1a | 0.1 | 2c | 5.6 | 2c | 4.9 |
| 29 | 0a | ... | (2c) | - | 0a | ... | 1a | 0.1 | 2b | 3.0 | 1b | 0.1 |
| 30 | 0a | ... | (1b) | - | (0a) | ... | 1b | 1.9 | 1b | 2.4 | 2c | 6.5 |
| 31 | 1a | 0.2 | 1b | 2.3 | | | 1b | 1.1 | | | 1c | 1.5 |
| Total | - | 25.7 | - | 72.7 | - | 53.9 | - | 14.6 | - | 148.6 | - | 106.9 |
| No. of days used | | 31 | | 27 | | 30 | | 31 | | 30 | | 31 |
| Mean | | 0.8 | | 2.7 | | 1.8 | | 0.5 | | 5.0 | | 3.4 |

Annual values: Character 0 1 2
No. of days used 110 151 104

Duration: Total 802.6
No. of days 360
Mean 2.23 hr.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns for hour, magnetic force components (gamma), and a mean column. Header: 93 ESKDALEMUIR (H) 16,000γ (0.16 C.G.S. unit) + JANUARY 1951. Rows include station identifiers (1-31) and a final Mean row. Each row has 23 data columns and one mean column.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns for hour, magnetic declination values, and a mean column. Header: 94 ESKDALEMUIR (D) 11° + JANUARY 1951. Rows include station identifiers (1-31) and a final Mean row. Each row has 23 data columns and one mean column.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 25 rows (1 to 28). Header includes '97 ESKDALEMUIR (H)', '16,000γ (0.16 C.G.S. unit) +', and 'FEBRUARY 1951'. Data represents magnetic force values in gamma units.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 25 rows (1 to 28). Header includes '98 ESKDALEMUIR (D)', '11° +', and 'FEBRUARY 1951'. Data represents magnetic declination values in degrees.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T., 0-1 to 23-24) and 25 rows (1 to 31). Includes sub-headers for '101 ESKDALEMUIR (H)' and '16,000γ (0.16 C.G.S. unit) +'. Data values range from approximately 547 to 609.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T., 0-1 to 23-24) and 25 rows (1 to 31). Includes sub-headers for '102 ESKDALEMUIR (D)' and '11° +'. Data values range from approximately 18.2 to 34.7.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 24 columns for hours (0-1 to 23-24) and a Mean column. Rows are labeled 1 q through 30 q. Header includes '105 ESKDALEUIR (H)', '16,000γ (0.16 C.G.S. unit) +', and 'APRIL 1951'.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 24 columns for hours (0-1 to 23-24) and a Mean column. Rows are labeled 1 q through 30 q. Header includes '106 ESKDALEUIR (D)', '11° +', and 'APRIL 1951'.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns for hours (0-1 to 23-24) and a Mean column. Rows are labeled with station '109 ESKDALEMUIR (H)' and magnetic force units '16,000γ (0.16 C.G.S. unit) +'. Data points range from 447 to 607.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns for hours (0-1 to 23-24) and a Mean column. Rows are labeled with station '110 ESKDALEMUIR (D)' and magnetic declination units '11° +'. Data points range from 17.5 to 34.4.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns: Hour G.M.T., 0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, Mean. Rows include station 113 ESKDALEMUIR (H) and values for 16,000γ (0.16 C.G.S. unit) +.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns: Hour G.M.T., 0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, Mean. Rows include station 114 ESKDALEMUIR (D) and values for 11° +.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 25 rows (1 to 31 d). Title: 117 ESKDALEMUIR (H) 16,000γ (0.16 C.G.S. unit) + JULY 1951. Contains numerical data for magnetic force components.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 25 rows (1 to 31 d). Title: 118 ESKDALEMUIR (D) 11° + JULY 1951. Contains numerical data for magnetic declination.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 1 column (Mean). Rows include station 121 ESKDALEMUIR (H) and data for hours 1 to 31, plus a Mean row.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 1 column (Mean). Rows include station 122 ESKDALEMUIR (D) and data for hours 1 to 31, plus a Mean row.

TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns for hours 0-1 to 24 and a Mean column. Rows represent days from 1 d to 31. Header includes '123 ESKDALEMUIR (Z)' and '44,000γ (0.44 C.G.S. unit) +'.

DAILY EXTREMES OF TERRESTRIAL MAGNETIC ELEMENTS, MAGNETIC CHARACTER FIGURES AND TEMPERATURE IN MAGNET HOUSE

Table with multiple columns: Horizontal force (Maximum, Minimum, Range), Declination (Maximum, Minimum, Range), Vertical force (Maximum, Minimum, Range), 3-hr. range indices K, Sum of K indices, Magnetic character of day (0-2), and Temperature in magnet house 200+. Rows represent days from 1 d to 31. Header includes '124 ESKDALEMUIR' and 'AUGUST 1951'.

q denotes an international quiet day and d an international disturbed day.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 25 rows (1 to 31 q). Includes sub-headers '129 ESKDALEMUIR (H)' and '16,000γ (0.16 C.G.S. unit) +'. Data values range from 548 to 608.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with 25 columns (Hour G.M.T. 0-1 to 23-24) and 25 rows (1 to 31 q). Includes sub-headers '130 ESKDALEMUIR (D)' and '11° +'. Data values range from 18.0 to 27.9.

TERRESTRIAL MAGNETIC FORCE: VERTICAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns: 131 ESKDALEMUIR (Z), 44,000γ (0.44 C.G.S. unit) +, OCTOBER 1951, Hour G.M.T., and Mean. Rows include hours 1 through 31 and a final Mean row.

DAILY EXTREMES OF TERRESTRIAL MAGNETIC ELEMENTS, MAGNETIC CHARACTER FIGURES AND TEMPERATURE IN MAGNET HOUSE

Table with columns: 132 ESKDALEMUIR, TERRESTRIAL MAGNETIC ELEMENTS, 3-hr. range indices, Sum of K indices, Magnetic character of day (0-2), Temperature in magnet house 200 +, and OCTOBER 1951. Rows include hours 1 through 31 and a final Mean row.

q denotes an international quiet day and d an international disturbed day.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns for Hour G.M.T. (0-1 to 23-24) and Mean, and rows for 133 ESKDALEMUIR (H) from 1 q to 30. Values range from 586 to 603.

MAGNETIC DECLINATION (WEST)
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns for Hour G.M.T. (0-1 to 23-24) and Mean, and rows for 134 ESKDALEMUIR (D) from 1 q to 30. Values range from 18.8 to 23.4.

TERRESTRIAL MAGNETIC FORCE: HORIZONTAL COMPONENT
Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table with columns for Station (137 ESKDALEMUIR (H)), Hour, G.M.T. intervals (0-1 to 23-24), and Mean values. Includes data for 31 days and a final mean row. Values are in units of 16,000γ (0.16 C.G.S. unit) +.

611 at 0-1h. January 1, 1952.

MAGNETIC DECLINATION (WEST)

Mean values for periods of sixty minutes ending at exact hours, G.M.T.

Table for Station 138 ESKDALEMUIR (D) showing Magnetic Declination (West). Columns include Hour, G.M.T. intervals (0-1 to 23-24), and Mean values in degrees. Values are in units of 11° +.

24.3 at 0-1h. January 1, 1952.

DIURNAL INEQUALITIES OF THE GEOGRAPHICAL COMPONENTS OF MAGNETIC FORCE
ALL DAYS

Departures from the mean of the 24 hourly values (uncorrected for non-cyclic change)

141 ESKDALEMUIR

Table with columns for Hour G.M.T. (0-1 to 23-24) and rows for months (Jan to Dec) and seasonal averages (Year, Winter, Equinox, Summer). It contains three sections: NORTH COMPONENT, WEST COMPONENT, and VERTICAL COMPONENT, each with 24 columns of magnetic force data values.

ALL DAYS

Departures from the mean of the 24 hourly values (uncorrected for non-cyclic change)

142 ESKDALEUIR

Table with columns for months (Jan-Dec), seasons (Year, Winter, Equinox, Summer), and hours (0-1 to 23-24). Rows are categorized by DECLINATION, INCLINATION, and HORIZONTAL FORCE, with numerical values in each cell.

RANGE OF MEAN DIURNAL INEQUALITIES FOR THE MONTHS, YEAR AND SEASONS OF 1951

The ranges are derived from the diurnal inequalities printed in Tables 141 to 146

147 ESKDALEMUIR

| | All days | | | Quiet days | | | Disturbed days | | | All days | | | Quiet days | | | Disturbed days | | |
|---------|----------|------|------|------------|------|------|----------------|------|-------|----------|------|------|------------|------|------|----------------|------|-------|
| | N | W | Z | N | W | Z | N | W | Z | D | I | H | D | I | H | D | I | H |
| Jan. | 11.7 | 37.4 | 24.0 | 15.9 | 22.0 | 7.4 | 31.5 | 70.7 | 64.2 | 7.75 | 1.12 | 10.4 | 4.66 | 1.01 | 14.2 | 14.88 | 3.06 | 22.7 |
| Feb. | 22.7 | 36.8 | 35.4 | 14.3 | 18.8 | 6.8 | 46.1 | 55.7 | 90.7 | 7.82 | 1.39 | 17.8 | 4.19 | 0.86 | 13.8 | 11.46 | 3.54 | 39.8 |
| Mar. | 33.5 | 50.1 | 41.4 | 38.4 | 31.3 | 15.0 | 42.2 | 92.1 | 115.8 | 11.01 | 1.88 | 27.9 | 6.91 | 2.22 | 35.2 | 18.80 | 3.57 | 35.9 |
| Apr. | 53.0 | 57.3 | 66.4 | 47.9 | 47.6 | 26.0 | 77.6 | 83.2 | 94.6 | 12.41 | 2.54 | 53.6 | 10.60 | 2.73 | 46.0 | 17.78 | 4.79 | 73.1 |
| May | 64.0 | 64.4 | 40.3 | 61.6 | 71.8 | 42.8 | 93.7 | 97.1 | 126.3 | 13.58 | 3.59 | 66.1 | 15.53 | 3.25 | 60.5 | 19.10 | 4.24 | 108.4 |
| June | 64.0 | 61.7 | 33.9 | 64.1 | 67.4 | 24.4 | 78.4 | 69.7 | 131.5 | 12.08 | 3.63 | 65.3 | 14.46 | 3.99 | 65.4 | 13.19 | 4.16 | 82.3 |
| July | 66.9 | 62.0 | 56.3 | 52.8 | 59.0 | 26.2 | 86.9 | 70.8 | 186.8 | 12.14 | 3.88 | 71.1 | 11.90 | 3.39 | 57.7 | 12.72 | 4.41 | 91.6 |
| Aug. | 62.1 | 53.9 | 47.0 | 53.3 | 56.6 | 22.0 | 85.4 | 63.4 | 110.7 | 11.38 | 3.36 | 61.7 | 11.88 | 3.35 | 55.6 | 14.13 | 4.47 | 84.7 |
| Sept. | 58.9 | 54.0 | 90.7 | 53.0 | 64.7 | 14.2 | 160.7 | 78.9 | 261.2 | 11.32 | 3.27 | 60.4 | 13.08 | 3.43 | 52.2 | 15.83 | 6.85 | 164.1 |
| Oct. | 46.6 | 47.3 | 49.5 | 37.0 | 35.0 | 11.4 | 140.5 | 78.3 | 177.8 | 10.11 | 2.33 | 45.2 | 7.32 | 2.26 | 36.1 | 14.52 | 9.30 | 158.1 |
| Nov. | 23.6 | 40.9 | 31.6 | 18.9 | 26.3 | 10.2 | 45.7 | 68.8 | 85.2 | 8.86 | 1.70 | 20.7 | 5.93 | 1.10 | 18.6 | 14.43 | 3.49 | 40.0 |
| Dec. | 22.5 | 40.5 | 30.3 | 13.9 | 20.3 | 7.7 | 50.1 | 79.0 | 100.2 | 8.75 | 1.72 | 20.9 | 4.41 | 0.86 | 13.4 | 16.83 | 5.70 | 49.4 |
| Year | 39.7 | 40.0 | 27.7 | 36.1 | 40.0 | 15.6 | 55.7 | 57.2 | 107.0 | 8.89 | 2.06 | 38.6 | 8.54 | 2.11 | 35.6 | 12.33 | 9.60 | 56.1 |
| Winter | 19.7 | 37.0 | 27.8 | 15.2 | 20.7 | 7.2 | 34.0 | 60.7 | 73.5 | 7.97 | 1.33 | 16.7 | 4.54 | 0.89 | 14.6 | 13.13 | 3.28 | 32.2 |
| Equinox | 44.4 | 47.3 | 60.4 | 41.5 | 43.2 | 15.0 | 79.6 | 76.8 | 142.3 | 10.39 | 2.35 | 43.4 | 9.16 | 2.44 | 38.5 | 14.47 | 3.79 | 79.0 |
| Summer | 62.8 | 58.7 | 45.4 | 56.9 | 61.4 | 28.0 | 77.9 | 61.9 | 125.1 | 12.20 | 3.58 | 65.7 | 12.97 | 3.46 | 59.0 | 12.96 | 3.85 | 80.7 |

NON-CYCLIC CHANGE

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| | All days | | | Quiet days | | | Disturbed days | | |
|---------|----------|-------|------|------------|-------|------|----------------|-------|-------|
| | H | D | Z | H | D | Z | H | D | Z |
| Jan. | -1.0 | -0.15 | +0.1 | +1.7 | +0.20 | -0.7 | -8.1 | -1.41 | -4.5 |
| Feb. | +1.3 | +0.05 | -0.5 | +7.4 | +0.58 | -1.2 | -8.3 | -0.23 | +1.7 |
| Mar. | +0.5 | +0.09 | 0.0 | +9.8 | -0.49 | -6.6 | -15.3 | -2.10 | 0.0 |
| Apr. | +0.8 | -0.02 | -0.1 | +1.1 | -1.37 | -4.3 | -12.3 | +2.37 | -24.1 |
| May | -0.1 | 0.00 | +0.2 | +4.9 | -0.07 | +2.3 | -30.4 | +1.70 | -16.7 |
| June | -0.5 | -0.07 | -0.1 | +0.5 | -1.35 | -2.7 | -4.9 | -0.59 | +2.9 |
| July | -0.2 | -0.16 | -0.8 | +1.9 | -0.08 | +1.2 | +20.5 | -0.03 | +63.3 |
| Aug. | +0.3 | +0.07 | +0.6 | +5.1 | -0.48 | +4.5 | -15.8 | +1.86 | +10.6 |
| Sept. | -0.1 | +0.02 | +0.6 | +6.8 | +0.66 | +4.3 | -71.1 | -0.75 | -93.2 |
| Oct. | -0.4 | +0.01 | +0.4 | +8.9 | +0.64 | -3.5 | -18.9 | -1.20 | -9.4 |
| Nov. | +0.1 | +0.01 | -0.2 | +3.9 | -0.46 | -2.4 | -7.1 | -3.29 | -9.5 |
| Dec. | 0.0 | +0.02 | -0.3 | +3.9 | +0.15 | -1.1 | -12.5 | +1.67 | +0.5 |
| Year | -0.1 | -0.01 | 0.0 | +4.7 | -0.17 | -0.9 | -15.3 | -0.17 | -6.5 |
| Winter | +0.1 | -0.02 | -0.2 | +4.2 | +0.12 | -1.3 | -9.0 | -0.81 | -2.9 |
| Equinox | +0.2 | +0.03 | +0.2 | +6.7 | -0.14 | -2.5 | -29.4 | -0.42 | -31.7 |
| Summer | -0.1 | -0.04 | 0.0 | +3.1 | -0.49 | -1.3 | -7.7 | +0.73 | +15.0 |

"Winter" comprises the four months January, February, November, December; "Equinox" the months March, April, September, October; and "Summer" May to August.

MEAN MONTHLY AND ANNUAL VALUES OF TERRESTRIAL MAGNETIC ELEMENTS

For all, a, quiet, q, and disturbed, d, days for H, D and Z and for all days for N, W, I and F

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| | Horizontal force | | | Declination (west) | | | Vertical force | | | North component all days | West component all days | Inclination (north) all days | Total force all days |
|-------|------------------|-----|-----|--------------------|------|------|----------------|------|------|--------------------------|-------------------------|------------------------------|----------------------|
| | a | q | d | a | q | d | a | q | d | | | | |
| | 16,000γ + | | | 11° + | | | 44,000γ + | | | | | | |
| Jan. | 581 | 588 | 571 | 29.1 | 29.5 | 28.7 | 1207 | 1203 | 1207 | 16249 | 3301 | 69 51.5 | 48151 |
| Feb. | 577 | 583 | 571 | 28.0 | 28.6 | 27.5 | 1203 | 1205 | 1193 | 16246 | 3295 | 69 51.7 | 48147 |
| Mar. | 579 | 587 | 572 | 27.8 | 28.4 | 27.2 | 1201 | 1201 | 1201 | 16248 | 3296 | 69 51.5 | 48145 |
| Apr. | 580 | 591 | 576 | 26.8 | 26.9 | 27.1 | 1201 | 1201 | 1200 | 16251 | 3291 | 69 51.4 | 48146 |
| May | 588 | 594 | 585 | 26.1 | 26.5 | 25.8 | 1204 | 1205 | 1207 | 16259 | 3289 | 69 50.9 | 48152 |
| June | 599 | 600 | 592 | 26.1 | 26.1 | 26.3 | 1194 | 1196 | 1187 | 16269 | 3291 | 69 50.0 | 48146 |
| July | 597 | 598 | 589 | 25.3 | 25.0 | 25.0 | 1197 | 1199 | 1181 | 16268 | 3287 | 69 50.2 | 48148 |
| Aug. | 593 | 596 | 591 | 24.7 | 24.8 | 24.6 | 1203 | 1204 | 1199 | 16265 | 3283 | 69 50.6 | 48153 |
| Sept. | 579 | 593 | 560 | 23.6 | 24.3 | 24.1 | 1208 | 1205 | 1213 | 16253 | 3275 | 69 51.6 | 48152 |
| Oct. | 584 | 594 | 579 | 23.6 | 23.7 | 24.1 | 1219 | 1217 | 1226 | 16257 | 3276 | 69 51.6 | 48165 |
| Nov. | 588 | 594 | 575 | 22.7 | 23.0 | 21.6 | 1223 | 1222 | 1221 | 16262 | 3273 | 69 51.4 | 48169 |
| Dec. | 591 | 599 | 575 | 22.2 | 22.6 | 21.7 | 1225 | 1222 | 1232 | 16265 | 3271 | 69 51.3 | 48172 |
| Year | 586 | 593 | 578 | 25.5 | 25.8 | 25.3 | 1207 | 1207 | 1206 | 16258 | 3285 | 69 51.1 | 48154 |



KEW

KEW OBSERVATORY

Latitude 51°28' N.
 Longitude 0°19' W.
 G.M.T. of Local Mean Noon 12h. 1m.

| | <i>Height of instruments</i> | |
|----------------------------------|------------------------------|---------------------|
| | <i>above M.S.L.</i> | <i>above ground</i> |
| | <i>m.</i> | <i>m.</i> |
| Barometer | 10·4 | .. |
| Thermometer bulbs | .. | 3·0 |
| Rain gauge site | 5·5 | .. |
| Tilting Siphon rain recorder rim | | 0·53 |
| Sunshine recorder | .. | 13·3 |
| Pressure-tube anemograph | 28 | 23 |

INTRODUCTION

Full details of the site, instruments, procedure and tabulation are given in the *Observatories' Year Book 1938*. Changes and additions only are mentioned here.

METEOROLOGY

Notes on the instruments

Pressure. The photographic barograph is mounted in the galvanometer room of the underground Seismograph House. It was transferred there on 15 May 1939 from the position in the north room of the basement of the main Observatory building which it had occupied since the inception of the record in 1862.

Temperature. As from January 1943, Kew adopted the practice followed by the other Observatories for the tabulation of hourly readings of temperature from the curves of the photo-thermograph, that is, by adjusting the glass scale, so that the readings at the control hours on the trace are made to show general agreement with the corresponding eye readings of the standard control thermometers, and then reading off the temperature equivalent from the curves at the requisite times. This supersedes method (a) set out on page 3 of the General Introduction to the *Observatories' Year Book 1938*.

Rainfall. On and after 1 October 1944, the hourly readings are from a Meteorological Office tilting siphon recorder, M.O.80, instead of from the old Beckley self-registering rain gauge No.1 which had been continuously in operation at Kew Observatory since 1871. The new instrument, whose funnel also has a collecting area of approximately 100 square inches, is set up 8·5 metres south-south-west of the standard check gauge with the rim at exactly the same height above ground level as was the old Beckley gauge, that is, 0·53 metres. From 1 January 1945 onwards the hourly readings are adjusted to give totals in agreement with the check gauge read daily at 9h. and 21h. Prior to 1 August 1944 the check gauge was read at 7h. and 18h.; from 1 August to 31 December 1944 at 6h. and 18h. A special instrument, known as the rainfall chronograph, which in effect is a sensitive drop counting gauge, is used to help in determining the duration of rainfall of 0·1 mm. per hour or more. This gauge stands on the lawn about 6·5 metres west-north-west of the tilting siphon recorder. The Jardi rate-of-rainfall recorder has proved to be unreliable at rates below 6 mm. per hour and such values are omitted from Table 162.

Sunshine. Throughout 1949 records were obtained from a new sunshine recorder and sphere set up alongside the standard recorder and sphere on the south parapet of the roof. The frame of the standard recorder has been in use since 1880 and it is believed that the glass sphere, of which it was said as far back as 1923 "the ball is now somewhat yellow", has not been changed. The comparison showed that for the year 1949 the discoloured sphere recorded 5 per cent less sunshine than the new sphere. The new sunshine recorder, frame M.O. 237 and glass sphere M.O. 950, replaced the old instrument as standard on 1 January 1950. The values published in Tables 166 and 167 are from the new instrument.

Solar radiation. The factors by which the printed values 1939 to 1945 should be multiplied are given in the Introduction for the years in question.*

Since 1934 data published in the *Observatories' Year Book* have been obtained from a Gorczyński pyrliograph, with its thermopile mounted on a clock driven heliostat, positioned near to the sunshine recorder on the roof. A new pyrliograph consisting of twin thermopiles (Kew Piles I and II) mounted on an electrically driven heliostat and connected to a Cambridge thread recorder, was installed alongside the Gorczyński in 1947. Both pyrliographs were standardized by observations with Ångström pyrliometers Nos. 24 and 100B. In 1950 the Gorczyński record showed increasing irregularities, attributable chiefly to the recording millivoltmeter and the heliostat and on 1 January 1951 the new pyrliograph (Kew Piles I and II) was adopted as the standard instrument. The values in Tables 166 and 168 are from this new instrument

Identification numbers of instruments in use in 1951

Thermometers Nos. 788 and 738 continued in use as the control dry-bulb and wet-bulb thermometers respectively. Rain measure No. 1999 was used as the measuring glass for the control rain-gauge throughout the year.

Thermometer corrections 1951.

| | No. N.P.L. | 788 1933 | 738 1933 | M.O. N.P.L. | 20430 1948 | 20428 1949 | M.O. N.P.L. | 18001 1929 |
|-----------|---------------|-------------|-------------|----------------|---------------|---------------|----------------|---------------|
| | °F | °F | °F | °F | °F | °F | °F | °F |
| Certified | 2 | +0.1 | +0.2 | 22 | -0.1 | 0.0 | 2 | +0.2 |
| | 12 | +0.1 | +0.1 | 32 | -0.1 | 0.0 | 22 | +0.1 |
| | 32 | 0.0 | 0.0 | 42 | -0.1 | 0.0 | 32 | 0.0 |
| | 52 | -0.1 | -0.1 | 52 | -0.1 | 0.0 | 52 | 0.0 |
| | 72 | 0.0 | -0.1 | 62 | -0.1 | -0.1 | 72 | 0.0 |
| | 92 | 0.0 | -0.1 | 72 | -0.1 | -0.1 | .. | ... |
| Applied | | 0.0 | 0.0 | | -0.1 | 0.0 | | As above |

Notes on the meteorological summaries

The mean temperature for the year 1951, 283.2°A. (50.4°F.), was again slightly higher than the average of 279.6°A. (49.6°F.) for the period 1871-1915. November and December were mild with mean temperatures 5.2°F. and 3.3°F. above the average for 1871-1915. There were no "ice days", that is days when the maximum temperature in the north-wall screen was 273.0°A. (32.0°F.) or less. The lowest temperature in the north-wall screen was 269.2°A. (25.2°F.) recorded at 10h.10m. on 30 January, whilst the lowest reading of the grass minimum thermometer was 262.9°A. (13.8°F.) on 12 December. There were no days in 1951 on which the maximum temperature in the north-wall screen exceeded 300°A. (80.6°F.); the highest reading was 299.9°A. (80.4°F.) at 16h.30m. on 19 July.

*STAGG, J. M.; Solar radiation at Kew Observatory. *Geophys. Mem., London*, 11, No. 86, 1950.

The rainfall for the year of 766 mm., 27 per cent above the average for the standard period 1881-1915, has only been exceeded once since 1927. Each of the months January to April was very wet, as were also August and November. February, with more than three times the average, was the wettest month of that name since the record commenced in 1866. June, July, October and December, each with only about half the normal amount, were the only dry months. The heaviest fall in one day was 28 mm. on 17 November.

The sunshine for the year, 1574 hours, was 105 hours above the normal for the period 1906-1935. April, June, November and December, each with about one third more than the average were sunny months, whilst May and September were dull. February, despite its wetness, had exactly the average amount of bright sunshine.

The highest wind speed recorded in a gust was 26 m./sec. (58 m.p.h.) at 21h.30m. on 4 February. The highest on record is 33 m./sec. (73 m.p.h.) on 16 March 1947.

Diurnal variation of pressure and temperature: harmonic analysis:- Notes on the tables will be found in the *Observatories' Year Book 1938*

TABLE 152 - DIURNAL VARIATION OF BAROMETRIC PRESSURE FOURIER COEFFICIENTS
Values of c_n , α_n in the series $\sum c_n \sin(15nt + \alpha_n)$, t being local mean time reckoned in hours from midnight

| | c_1 | | α_1 | | c_2 | | α_2 | | c_3 | | α_3 | | c_4 | | α_4 | |
|-----------------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|
| | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 |
| | mb. | mb. | ° | ° | mb. | mb. | ° | ° | mb. | mb. | ° | ° | mb. | mb. | ° | ° |
| January | 0.45 | 0.02 | 117 | 315 | 0.33 | 0.31 | 160 | 151 | 0.18 | 0.17 | 350 | 346 | 0.06 | 0.07 | 201 | 202 |
| February | 0.18 | 0.05 | 104 | 73 | 0.48 | 0.36 | 152 | 146 | 0.12 | 0.12 | 341 | 340 | 0.04 | 0.03 | 128 | 108 |
| March | 0.37 | 0.11 | 331 | 38 | 0.39 | 0.40 | 146 | 149 | 0.08 | 0.07 | 325 | 332 | 0.06 | 0.04 | 345 | 25 |
| April | 0.37 | 0.28 | 81 | 31 | 0.35 | 0.40 | 159 | 151 | 0.05 | 0.03 | 347 | 185 | 0.09 | 0.04 | 47 | 353 |
| May | 0.20 | 0.32 | 99 | 27 | 0.35 | 0.35 | 146 | 148 | 0.07 | 0.09 | 164 | 161 | 0.04 | 0.02 | 289 | 319 |
| June | 0.43 | 0.30 | 15 | 17 | 0.31 | 0.32 | 142 | 143 | 0.12 | 0.09 | 155 | 160 | 0.01 | 0.01 | 296 | 260 |
| July | 0.34 | 0.26 | 8 | 16 | 0.30 | 0.31 | 133 | 140 | 0.12 | 0.10 | 133 | 153 | 0.01 | 0.01 | 326 | 281 |
| August | 0.15 | 0.21 | 152 | 20 | 0.35 | 0.34 | 151 | 144 | 0.06 | 0.06 | 144 | 155 | 0.01 | 0.04 | 328 | 309 |
| September | 0.28 | 0.12 | 38 | 6 | 0.37 | 0.40 | 157 | 152 | 0.02 | 0.01 | 58 | 350 | 0.05 | 0.04 | 297 | 332 |
| October | 0.13 | 0.06 | 138 | 76 | 0.41 | 0.38 | 344 | 160 | 0.12 | 0.09 | 179 | 359 | 0.01 | 0.01 | 198 | 22 |
| November | 0.13 | 0.03 | 320 | 124 | 0.26 | 0.34 | 362 | 160 | 0.18 | 0.13 | 188 | 358 | 0.02 | 0.03 | 355 | 183 |
| December | 0.23 | 0.08 | 287 | 137 | 0.28 | 0.31 | 157 | 152 | 0.20 | 0.15 | 360 | 353 | 0.10 | 0.07 | 215 | 205 |
| Arithmetic mean | 0.27 | 0.15 | | | 0.35 | 0.35 | | | 0.11 | 0.09 | | | 0.04 | 0.03 | | |
| Year | 0.12 | 0.14 | 43 | 29 | 0.23 | 0.35 | 151 | 150 | 0.00 | 0.03 | 76 | 359 | 0.00 | 0.01 | 280 | 280 |
| Winter | 0.07 | 0.03 | 106 | 111 | 0.19 | 0.33 | 166 | 152 | 0.08 | 0.14 | 343 | 350 | 0.04 | 0.05 | 201 | 208 |
| Equinox | 0.15 | 0.14 | 25 | 32 | 0.18 | 0.39 | 148 | 153 | 0.01 | 0.04 | 267 | 345 | 0.03 | 0.03 | 1 | 359 |
| Summer | 0.18 | 0.27 | 36 | 20 | 0.33 | 0.33 | 143 | 144 | 0.09 | 0.08 | 148 | 157 | 0.02 | 0.02 | 301 | 305 |

"Winter" comprises the four months January, February, November, December; "Equinox" the months March, April, September, October; and "Summer" May to August.

TABLE 153 - DIURNAL VARIATION OF TEMPERATURE FOURIER COEFFICIENTS

Values of c_n , α_n in the series $\sum c_n \sin(15nt + \alpha_n)$, t being local mean time reckoned in hours from midnight

| | c_1 | | α_1 | | c_2 | | α_2 | | c_3 | | α_3 | | c_4 | | α_4 | |
|-----------------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|-------|-----------|------------|-----------|
| | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 | 1951 | 1871-1926 |
| | °A. | °A. | ° | ° | °A. | °A. | ° | ° | °A. | °A. | ° | ° | °A. | °A. | ° | ° |
| January | 0.90 | 0.99 | 224 | 221 | 0.39 | 0.43 | 8 | 35 | 0.19 | 0.17 | 212 | 208 | 0.03 | 0.01 | 37 | 3 |
| February | 1.34 | 1.53 | 225 | 221 | 0.31 | 0.57 | 29 | 34 | 0.14 | 0.12 | 185 | 211 | 0.09 | 0.06 | 190 | 169 |
| March | 1.69 | 2.45 | 223 | 222 | 0.43 | 0.63 | 46 | 40 | 0.07 | 0.07 | 328 | 334 | 0.11 | 0.11 | 191 | 197 |
| April | 3.07 | 3.21 | 225 | 226 | 0.37 | 0.48 | 64 | 51 | 0.17 | 0.22 | 42 | 24 | 0.10 | 0.07 | 227 | 218 |
| May | 2.76 | 3.72 | 226 | 227 | 0.08 | 0.15 | 43 | 74 | 0.20 | 0.31 | 353 | 35 | 0.09 | 0.04 | 93 | 20 |
| June | 3.85 | 3.72 | 222 | 226 | 0.05 | 0.02 | 184 | 84 | 0.26 | 0.26 | 14 | 35 | 0.09 | 0.10 | 40 | 33 |
| July | 3.61 | 3.68 | 221 | 225 | 0.11 | 0.06 | 136 | 50 | 0.30 | 0.29 | 20 | 31 | 0.11 | 0.07 | 43 | 28 |
| August | 2.25 | 3.54 | 226 | 226 | 0.26 | 0.34 | 58 | 52 | 0.23 | 0.30 | 30 | 28 | 0.56 | 0.03 | 273 | 218 |
| September | 2.74 | 3.22 | 230 | 228 | 0.46 | 0.71 | 43 | 49 | 0.11 | 0.14 | 73 | 24 | 0.22 | 0.16 | 175 | 213 |
| October | 2.66 | 2.32 | 228 | 229 | 0.76 | 0.76 | 37 | 50 | 0.13 | 0.10 | 246 | 248 | 0.09 | 0.12 | 227 | 200 |
| November | 1.00 | 1.39 | 165 | 226 | 0.66 | 0.57 | 22 | 44 | 0.16 | 0.18 | 303 | 232 | 0.12 | 0.02 | 332 | 141 |
| December | 0.88 | 0.90 | 50 | 226 | 0.46 | 0.40 | 214 | 41 | 0.20 | 0.16 | 20 | 215 | 0.08 | 0.04 | 205 | 38 |
| Arithmetic mean | 2.23 | 2.56 | | | 0.36 | 0.43 | | | 0.18 | 0.19 | | | 0.14 | 0.07 | | |
| Year | 2.08 | 2.56 | 226 | 226 | 0.26 | 0.42 | 41 | 45 | 0.10 | 0.08 | 6 | 17 | 0.03 | 0.02 | 185 | 195 |
| Winter | 0.55 | 1.20 | 239 | 223 | 0.23 | 0.49 | 17 | 39 | 0.05 | 0.15 | 259 | 217 | 0.02 | 0.01 | 251 | 121 |
| Equinox | 2.54 | 2.80 | 226 | 226 | 0.50 | 0.64 | 45 | 47 | 0.08 | 0.09 | 11 | 4 | 0.12 | 0.11 | 194 | 207 |
| Summer | 3.18 | 3.67 | 223 | 226 | 0.09 | 0.14 | 79 | 59 | 0.24 | 0.29 | 15 | 32 | 0.06 | 0.04 | 48 | 27 |

"Winter" comprises the four months January, February, November, December; "Equinox" the months March, April, September, October; and "Summer" May to August.

Atmospheric Electricity

There were no changes in the procedure for observing potential gradient. Continuation of the troubles mentioned in the Introduction to the 1949 year book prevented satisfactory measurements of air-earth current by the Wilson apparatus and led to some doubt about the accuracy of the potential gradient measurements given in Table 174 (the errors are not thought to exceed 10%).

Factors for the reduction of the Kelvin electrograph records were obtained from observations of the potential of a wire stretched 1 m above the level grass surface of the paddock.*

The mean factor for the year for the Kelvin electrograph was 4.15, giving an equivalent height for the collector of 24.1 cm. In 1950 there were 112, 139 and 59 days of electrical character, 0, 1, and 2 respectively. The extreme hourly values of potential gradient in Table 176 are plus 1650 volts per metre at 9h. on 30 January and minus 1210 volts per metre at 9h. on 16 February.

During the following months, when there were not 10 "quiet" calendar days, other spells of 24 hours were used as indicated.

| | 1951 | Calendar days | Other spells | Total |
|----------|------|---------------|--------------|-------|
| January | | 8 | 2 | 10 |
| February | | 3 | 2 | 5 |
| March | | 2 | 3 | 5 |
| April | | 6 | 3 | 9 |
| May | | 7 | 3 | 10 |
| June | | 7 | 3 | 10 |
| August | | 9 | 1 | 10 |
| November | | 3 | 1 | 4 |
| December | | 4 | 2 | 6 |

*SCRASE F.J.; Observation of atmospheric electricity at Kew Observatory. *Geophys. Mem. London*, 7, No. 60, 1934.

The *Observatories' Year Book 1938* should be consulted for an explanation of the figures in the foregoing paragraphs.

Atmospheric Pollution

From 1 January 1950 the method of tabulation was revised to eliminate the need for interpolation between shade numbers.

During 1951, for the 349 days on which the record of the Owens pollution recorder was available, the highest estimate of pollution was 2.3 mg.m.^{-3} , this value occurring at 23h. and 24h. on 13 December. There were 35 days on which the pollution reached 0.95 mg.m.^{-3} . The number of hours credited with at least 0.95 mg.m.^{-3} was 153, of which 45 were recorded in October and 70 in December.

Seismology

The seismological diary and table of microseisms, which were printed in the *Observatories' Year Book* from 1922 to 1939 are now omitted. The distribution of the *Kew Monthly Bulletin*, which ceased in May 1940, was resumed in January 1947. Seismological data for 1951 are also published in the *International Seismological Summary*.

Changes in instruments or procedures from those printed in the the Introduction for 1938 are given in the Introductions for the years 1939, 1947, 1949 and 1950. All the three Galitzin seismographs were re-standardized during 1951 and found satisfactory. The total number of shocks measured during the year was 411. The phases of 91 of these were sufficiently well defined to allow an estimate of the epicentral distance to be computed.

No British earthquakes were recorded during 1951.

PRESSURE AT STATION LEVEL
Monthly and annual means of hourly values in millibars at exact hours, G.M.T.

155 KEW OBSERVATORY: $h_b = 10.4$ m.

Table with 25 columns for hours (0-24) and a Mean column. Rows for months Jan-Dec and Annual. Values in millibars.

The initial 9 or 10 of the value is omitted, i.e. 1001.42 is printed 01.42.

PRESSURE REDUCED TO MEAN SEA LEVEL
Monthly and annual means of hourly values in millibars at exact hours, G.M.T.

156 KEW OBSERVATORY: $h_b = 10.4$ m.

Table with 25 columns for hours (0-24) and a Mean column. Rows for months Jan-Dec and Annual. Values in millibars.

The initial 9 or 10 of the value is omitted, i.e. 1001.42 is printed 01.42

The monthly and annual values of pressure reduced to mean sea level are computed from the corresponding monthly and annual means of pressure at station level and of temperature. See General Introduction to the Meteorological Tables, 1938.

TEMPERATURE
Monthly and annual means of readings in degrees Absolute at exact hours, G.M.T.

157 KEW OBSERVATORY: North-wall screen: $h_t = 3.0$ m.

Table with 25 columns for hours (0-24) and a Mean column. Rows for months Jan-Dec and Annual. Values in degrees Absolute.

The initial 2 or 3 of the readings is omitted, i.e. 275.00 degrees Absolute is printed 75.00

Add 0.16° to obtain temperature in degrees Kelvin where $T(^{\circ}K) = t(^{\circ}C) + 273.16$.

RAINFALL

Monthly and annual totals of amounts in sixty-minute periods between exact hours, G.M.T.

163 KEW OBSERVATORY: $h_r = 5.5 \text{ m.} + 0.53 \text{ m.}$

| | Hour G.M.T. | | | | | | | | | | | | | | | | | | | | | | 0-24 | | |
|--------|-------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | | 22-23 | 23-24 |
| | millimetres | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | 6.0 | 3.6 | 2.7 | 1.5 | 2.3 | 0.6 | 2.4 | 8.3 | 4.8 | 6.4 | 7.3 | 6.5 | 3.4 | 2.9 | 3.8 | 1.3 | 3.1 | 0.9 | 1.6 | 0.7 | 2.0 | 0.8 | 1.5 | 2.9 | 77.3 |
| Feb. | 6.5 | 4.9 | 4.7 | 5.8 | 2.2 | 5.7 | 8.3 | 5.7 | 5.3 | 8.3 | 7.7 | 8.0 | 6.7 | 7.2 | 4.1 | 3.0 | 6.1 | 6.2 | 3.4 | 0.7 | 1.9 | 2.1 | 5.1 | 7.0 | 126.6 |
| Mar. | 4.5 | 1.7 | 5.4 | 4.5 | 0.8 | 0.6 | 0.4 | 3.0 | 1.3 | 0.9 | 1.0 | 0.9 | 3.1 | 0.8 | 3.6 | 9.2 | 2.8 | 7.4 | 2.3 | 4.9 | 1.8 | 3.6 | 4.6 | 3.8 | 72.9 |
| Apr. | 2.1 | 3.0 | 5.2 | 4.2 | 6.9 | 3.0 | 1.1 | 0.8 | 0.9 | 0.7 | 2.7 | 3.2 | 2.3 | 0.6 | 2.7 | 1.6 | 4.3 | 3.1 | 4.0 | 0.5 | 0.9 | 2.4 | 1.7 | 0.6 | 58.5 |
| May | 3.7 | 5.1 | 1.2 | 0.8 | 1.3 | 1.1 | 2.4 | 5.3 | 1.1 | 0.1 | 0.6 | 0.8 | 2.1 | 5.8 | 3.3 | 3.5 | 0.9 | 0.7 | 2.2 | 1.6 | 0.6 | 1.9 | 2.0 | 3.1 | 51.2 |
| June | 0.1 | 1.1 | 3.5 | 2.9 | 4.2 | 3.2 | 0.9 | ... | ... | ... | ... | 0.1 | 0.3 | 2.0 | 0.7 | 3.8 | 0.4 | ... | ... | ... | 0.1 | ... | 0.3 | 0.2 | 23.8 |
| July | 0.7 | 2.6 | ... | ... | ... | ... | 1.0 | 0.1 | ... | ... | ... | ... | ... | 5.4 | 1.0 | 0.1 | 0.3 | 1.6 | 3.2 | 3.1 | 5.3 | 0.3 | 0.4 | 0.2 | 25.3 |
| Aug. | 4.4 | 4.5 | 6.2 | 10.8 | 2.3 | 0.9 | 0.4 | 2.5 | 1.1 | 0.9 | 1.2 | 1.3 | 8.5 | 2.7 | 6.8 | 4.2 | 5.8 | 4.7 | 2.3 | 3.2 | 1.2 | 1.7 | 4.7 | 2.8 | 85.1 |
| Sept. | 4.5 | 0.3 | 0.3 | 0.3 | 1.1 | 0.1 | 2.1 | 0.8 | 3.1 | 0.8 | 2.5 | 0.1 | 0.8 | 1.2 | 0.6 | 2.0 | 2.5 | 7.5 | 10.9 | 4.4 | 2.5 | 2.5 | 2.0 | 0.6 | 53.5 |
| Oct. | 1.3 | 0.2 | ... | 0.2 | 0.3 | 0.3 | 1.9 | 2.4 | 0.9 | 1.1 | 1.9 | 0.3 | 3.9 | ... | 1.0 | 1.7 | ... | 0.4 | 0.3 | 0.4 | 0.3 | 1.1 | 0.5 | 0.1 | 21.0 |
| Nov. | 3.1 | 2.8 | 2.4 | 5.3 | 5.5 | 7.1 | 9.4 | 6.1 | 3.1 | 9.9 | 6.7 | 8.9 | 4.8 | 4.0 | 6.5 | 3.8 | 1.9 | 4.6 | 8.2 | 10.1 | 7.8 | 4.9 | 3.4 | 4.1 | 134.4 |
| Dec. | 1.5 | 2.8 | 0.8 | 1.8 | 2.1 | 2.5 | 2.4 | 1.0 | 1.2 | 0.2 | 0.1 | 0.1 | ... | 0.6 | 2.0 | 3.0 | 4.0 | 2.4 | 2.9 | 1.8 | 1.2 | 0.9 | 0.6 | 0.8 | 36.7 |
| Annual | 38.4 | 32.6 | 32.4 | 38.1 | 29.0 | 25.1 | 32.7 | 36.0 | 22.8 | 29.3 | 31.7 | 30.7 | 35.9 | 33.2 | 36.1 | 37.2 | 32.1 | 39.5 | 41.3 | 31.4 | 25.6 | 22.2 | 26.8 | 26.2 | 766.3 |

RAINFALL

Monthly and annual totals of duration in sixty-minute periods between exact hours, G.M.T.

164 KEW OBSERVATORY: $h_r = 5.5 \text{ m.} + 0.53 \text{ m.}$

| | Hour G.M.T. | | | | | | | | | | | | | | | | | | | | | | 0-24 | | |
|--------|-------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | | 22-23 | 23-24 |
| | hours | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan. | 4.4 | 4.6 | 3.2 | 2.1 | 2.2 | 0.6 | 2.3 | 4.2 | 2.8 | 3.7 | 4.8 | 3.6 | 2.7 | 2.6 | 2.9 | 1.6 | 1.4 | 0.5 | 1.0 | 1.1 | 1.3 | 0.9 | 0.8 | 1.6 | 56.9 |
| Feb. | 5.2 | 3.6 | 2.7 | 3.2 | 2.4 | 5.1 | 5.6 | 6.2 | 5.9 | 6.5 | 6.9 | 7.0 | 5.5 | 4.8 | 4.2 | 3.6 | 3.6 | 4.0 | 3.6 | 1.3 | 1.8 | 2.8 | 3.6 | 4.4 | 103.5 |
| Mar. | 3.9 | 2.4 | 2.8 | 3.0 | 1.0 | 1.4 | 0.5 | 1.8 | 2.5 | 1.9 | 1.8 | 1.3 | 2.1 | 1.0 | 3.1 | 4.1 | 3.3 | 4.2 | 3.3 | 3.6 | 2.4 | 2.5 | 2.9 | 2.5 | 59.3 |
| Apr. | 1.8 | 1.9 | 2.7 | 3.4 | 3.5 | 2.0 | 1.2 | 0.9 | 1.0 | 0.5 | 1.9 | 1.5 | 0.9 | 0.4 | 1.7 | 1.4 | 2.0 | 1.3 | 1.2 | 0.6 | 1.8 | 1.6 | 2.0 | 0.9 | 38.1 |
| May | 2.5 | 2.9 | 1.4 | 0.9 | 2.1 | 1.2 | 2.0 | 2.3 | 1.1 | 0.1 | 0.6 | 0.8 | 1.1 | 1.4 | 2.0 | 2.2 | 1.0 | 1.1 | 2.3 | 2.0 | 1.3 | 1.9 | 1.3 | 1.9 | 37.4 |
| June | 0.1 | 0.8 | 1.0 | 0.9 | 1.2 | 1.5 | 1.0 | ... | ... | ... | ... | ... | 0.1 | 1.4 | 0.7 | 0.7 | 0.4 | ... | ... | ... | 0.1 | ... | 0.2 | 0.2 | 10.3 |
| July | 0.3 | 0.4 | ... | ... | ... | ... | 0.8 | 0.1 | ... | ... | ... | ... | ... | 1.2 | 0.5 | 0.1 | 0.4 | 1.1 | 1.1 | 1.6 | 2.8 | 0.3 | 0.3 | 0.2 | 11.2 |
| Aug. | 1.9 | 3.2 | 2.5 | 2.9 | 1.5 | 1.3 | 0.9 | 1.4 | 1.6 | 1.1 | 1.5 | 0.9 | 2.6 | 2.0 | 2.6 | 2.1 | 2.5 | 2.1 | 2.2 | 2.1 | 1.6 | 1.5 | 3.3 | 1.3 | 46.6 |
| Sept. | 1.3 | 0.2 | 0.2 | 0.1 | 1.3 | ... | 0.2 | 0.8 | 1.0 | 1.1 | 1.1 | 0.1 | 0.3 | 0.3 | 0.6 | 1.2 | 1.7 | 3.0 | 3.3 | 2.7 | 1.9 | 1.2 | 1.2 | 0.8 | 25.6 |
| Oct. | 0.7 | 0.2 | ... | 0.5 | 0.2 | 0.3 | 1.8 | 1.8 | 1.0 | 0.5 | 1.0 | 0.9 | 1.7 | ... | 0.6 | 1.3 | ... | 0.6 | 0.5 | 0.3 | 0.3 | 0.6 | 0.6 | 0.1 | 15.5 |
| Nov. | 3.5 | 3.4 | 2.5 | 3.0 | 2.6 | 4.4 | 3.7 | 4.0 | 3.8 | 5.6 | 4.3 | 5.5 | 3.8 | 3.6 | 4.3 | 3.9 | 2.0 | 4.9 | 5.9 | 5.2 | 3.7 | 3.0 | 3.5 | 2.7 | 92.8 |
| Dec. | 2.4 | 1.8 | 0.9 | 1.1 | 1.9 | 2.4 | 2.5 | 1.2 | 1.0 | 0.2 | ... | 0.1 | ... | 0.6 | 1.8 | 2.3 | 3.5 | 2.6 | 2.0 | 1.4 | 1.4 | 1.5 | 1.1 | 1.7 | 35.4 |
| Annual | 28.0 | 25.4 | 19.9 | 21.1 | 19.9 | 20.2 | 22.5 | 24.7 | 21.7 | 21.2 | 23.9 | 21.7 | 20.8 | 19.3 | 25.0 | 24.5 | 21.8 | 25.4 | 26.4 | 21.9 | 20.4 | 17.8 | 20.8 | 18.3 | 532.6 |

NOTES ON RAINFALL

165 KEW OBSERVATORY

Dry Periods

The following definitions are adopted by the British Rainfall Organization.

An "absolute drought" is a period of at least 15 consecutive days to none of which is credited 0.2 mm. of rain or more.

A "partial drought" is a period of at least 29 consecutive days, the mean daily rainfall of which does not exceed 0.2 mm.

A "dry spell" is a period of at least 15 consecutive days to none of which is credited 1.0 mm. of rain or more.

"Absolute drought": None in 1951

"Partial drought": September 29 - October 28

"Dry spell": None in 1951

Wet Periods

The following definitions are adopted by the British Rainfall Organization.

A "rain spell" is a period of at least 15 consecutive days to each of which is credited 0.2 mm. of rain or more.

A "wet spell" is a period of at least 15 consecutive days to each of which is credited 1.0 mm. of rain or more.

There were no "rain spells" or "wet spells" in 1951.

Rainfall Duration

| | | | | | |
|----------------|---------|---------|---------|----------|-------|
| Hours | 0.1-1.0 | 1.1-2.0 | 2.1-6.0 | 6.1-12.0 | >12.0 |
| Number of days | 68 | 37 | 55 | 25 | 1 |

Continuous or Heavy Falls

The fall of the longest duration occurred on February 4 when 17 mm. fell in 10 hours and 36 minutes.

Heavy Falls in short periods

None occurred in 1951

Rate of Rainfall (Jardi Recorder)

The highest instantaneous rate of rainfall recorded by this instrument was 135 mm./hr. on August 12. The maximum rate exceeded 50 mm./hr. on April 1, 13; July 11; August 12, 20, 26, 30; September 12 and October 29.

DURATION OF BRIGHT SUNSHINE

Monthly and annual totals between exact hours, local apparent time

167 KEW OBSERVATORY: h_s (height of recorder above ground) = 13.3 m.

| | Hour L.A.T. | | | | | | | | | | Total | Per cent. of possible | | | | | | | | |
|--------|--------------|-----|------|------|------|-------|-------|-------|-------|-------|-------|-----------------------|-------|-------|-------|-------|-------|-------|--------|-------|
| | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | | | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 |
| | <i>hours</i> | | | | | | | | | | | | | | | | | | | |
| Jan. | - | - | - | - | ... | 2.8 | 6.9 | 7.7 | 9.4 | 8.1 | 8.7 | 5.8 | 1.4 | ... | - | - | - | - | 50.8 | 20 |
| Feb. | - | - | - | ... | 1.4 | 4.8 | 6.2 | 8.0 | 8.2 | 8.8 | 8.5 | 8.7 | 5.7 | 1.4 | ... | - | - | - | 61.7 | 22 |
| Mar. | - | - | ... | 2.0 | 6.6 | 9.0 | 9.6 | 8.2 | 9.3 | 9.8 | 9.7 | 9.7 | 8.6 | 5.9 | 2.1 | ... | - | - | 90.5 | 25 |
| Apr. | - | ... | 1.3 | 10.9 | 15.5 | 19.6 | 18.3 | 17.7 | 17.9 | 17.7 | 17.9 | 17.3 | 16.6 | 14.6 | 11.5 | 0.4 | ... | - | 197.2 | 48 |
| May | ... | 0.4 | 4.2 | 7.1 | 9.5 | 12.1 | 12.4 | 11.8 | 12.9 | 11.4 | 13.1 | 12.0 | 10.5 | 12.6 | 13.5 | 10.1 | 1.3 | ... | 154.9 | 32 |
| June | ... | 1.9 | 12.2 | 17.2 | 18.3 | 19.0 | 20.9 | 21.7 | 19.2 | 16.2 | 16.3 | 20.5 | 18.8 | 18.1 | 15.7 | 15.3 | 7.1 | ... | 258.4 | 52 |
| July | ... | 2.6 | 11.5 | 15.7 | 16.5 | 18.0 | 18.0 | 20.9 | 20.0 | 16.2 | 17.0 | 15.4 | 11.9 | 11.0 | 12.8 | 12.6 | 2.8 | ... | 222.9 | 45 |
| Aug. | - | 0.3 | 5.2 | 11.6 | 14.4 | 15.8 | 16.2 | 17.2 | 16.6 | 16.5 | 15.2 | 14.1 | 16.0 | 13.6 | 9.9 | 5.4 | 0.4 | - | 188.4 | 42 |
| Sept. | - | - | 0.4 | 3.4 | 7.5 | 12.3 | 14.5 | 13.7 | 13.6 | 11.9 | 11.7 | 10.8 | 10.1 | 8.2 | 1.9 | ... | - | - | 120.0 | 32 |
| Oct. | - | - | - | ... | 1.9 | 5.9 | 10.9 | 12.3 | 14.4 | 13.9 | 14.2 | 14.7 | 12.4 | 3.8 | ... | - | - | - | 104.4 | 31 |
| Nov. | - | - | - | - | 0.1 | 4.5 | 9.3 | 10.8 | 11.4 | 10.9 | 11.4 | 8.4 | 4.1 | 0.2 | - | - | - | - | 71.1 | 27 |
| Dec. | - | - | - | - | ... | 0.7 | 4.5 | 7.1 | 10.4 | 11.7 | 9.9 | 8.6 | 1.1 | ... | - | - | - | - | 54.0 | 22 |
| Annual | ... | 5.2 | 34.8 | 67.9 | 91.7 | 124.5 | 147.7 | 157.1 | 163.3 | 153.1 | 153.6 | 146.0 | 117.2 | 89.4 | 67.4 | 43.8 | 11.6 | ... | 1574.3 | 35 |

SOLAR RADIATION RECEIVED ON A SURFACE PERPENDICULAR TO THE SOLAR BEAM

Monthly and annual totals between exact hours, local apparent time

168 KEW OBSERVATORY: h_s = 13.3 m.

| | Hour L.A.T. | | | | | | | | | | Total | | | | | | | | |
|--------|-------------------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 |
| | <i>joules per square centimetre</i> | | | | | | | | | | | | | | | | | | |
| Jan. | - | - | - | - | 10 | 450 | 890 | 1020 | 1140 | 920 | 930 | 620 | 260 | ... | - | - | - | - | 6240 |
| Feb. | - | - | - | ... | 180 | 600 | 890 | 1210 | 1240 | 1200 | 1050 | 870 | 660 | 200 | ... | - | - | - | 8100 |
| Mar. | - | - | ... | 400 | 940 | 1580 | 1540 | 1060 | 1290 | 1240 | 1500 | 1490 | 1140 | 800 | 330 | ... | - | - | 13310 |
| Apr. | - | ... | 370 | 1750 | 2680 | 3550 | 3160 | 3060 | 3120 | 3250 | 3230 | 3030 | 2830 | 2160 | 1220 | 150 | - | - | 33560 |
| May | ... | 100 | 620 | 990 | 1510 | 1860 | 2220 | 2030 | 2140 | 1850 | 2020 | 1630 | 1820 | 1950 | 1980 | 970 | 150 | ... | 23840 |
| June | ... | 670 | 1740 | 2600 | 3280 | 3780 | 4370 | 4730 | 4590 | 4060 | 3960 | 4040 | 3320 | 3030 | 2410 | 1840 | 700 | ... | 49120 |
| July | ... | 400 | 1570 | 2570 | 2830 | 3080 | 3180 | 3490 | 3920 | 3260 | 2960 | 2340 | 1800 | 1800 | 1620 | 1240 | 360 | ... | 36420 |
| Aug. | - | 60 | 690 | 1890 | 2610 | 2980 | 3290 | 3260 | 3250 | 3130 | 2990 | 2470 | 2050 | 1820 | 1130 | 480 | 20 | - | 32120 |
| Sept. | - | - | 110 | 570 | 1210 | 1780 | 1960 | 2000 | 1770 | 1550 | 1270 | 1280 | 1300 | 920 | 330 | ... | - | - | 16050 |
| Oct. | - | - | - | 10 | 260 | 820 | 1590 | 1740 | 2060 | 2230 | 2070 | 2160 | 1570 | 540 | ... | - | - | - | 15050 |
| Nov. | - | - | - | - | 40 | 480 | 1220 | 1490 | 1770 | 1730 | 1270 | 960 | 510 | 50 | - | - | - | - | 9520 |
| Dec. | - | - | - | - | ... | 130 | 530 | 920 | 1500 | 1550 | 1270 | 1000 | 250 | ... | - | - | - | - | 7150 |
| Annual | ... | 1230 | 5100 | 10780 | 15550 | 21090 | 24840 | 26010 | 27790 | 25970 | 24520 | 21890 | 17510 | 13270 | 9020 | 4680 | 1230 | ... | 250480 |

ELECTRICAL OBSERVATIONS, UNDERGROUND LABORATORY, WILSON METHOD

Mean value for periods of twenty minutes about 14h. 30m.

F = Potential gradient, unit 1 v./cm. λ^+ = Conductivity due to positive ions, unit 10^{-10} ohm.⁻¹ cm.⁻¹
 i = Air-earth current, unit 10^{-10} amp. cm.⁻²

174 KEW OBSERVATORY

| | JANUARY | | | FEBRUARY | | | MARCH | | | APRIL | | | MAY | | | JUNE | | |
|------------------|---------|-------------|---|----------|-------------|---|-------|-------------|---|-------|-------------|---|------|-------------|---|------|-------------|---|
| | F | λ^+ | i | F | λ^+ | i | F | λ^+ | i | F | λ^+ | i | F | λ^+ | i | F | λ^+ | i |
| 1 | ... | - | - | ... | - | - | 5.10 | - | - | ... | - | - | ... | - | - | 3.37 | - | - |
| 2 | ... | - | - | 1.49 | - | - | ... | - | - | 7.17 | - | - | ... | - | - | ... | - | - |
| 3 | ... | - | - | ... | - | - | ... | - | - | 2.32 | - | - | ... | - | - | ... | - | - |
| 4 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | 6.26 | - | - |
| 5 | ... | - | - | ... | - | - | ... | - | - | 3.19 | - | - | ... | - | - | ... | - | - |
| 6 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 7 | ... | - | - | 4.79 | - | - | 4.33 | - | - | ... | - | - | 1.42 | - | - | 4.89 | - | - |
| 8 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | 3.80 | - | - |
| 9 | 8.72 | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 10 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | 2.26 | - | - | ... | - | - |
| 11 | ... | - | - | ... | - | - | ... | - | - | 3.31 | - | - | ... | - | - | ... | - | - |
| 12 | ... | - | - | 3.90 | - | - | 4.42 | - | - | ... | - | - | ... | - | - | 1.53 | - | - |
| 13 | ... | - | - | ... | - | - | ... | - | - | 5.40 | - | - | ... | - | - | 1.60 | - | - |
| 14 | ... | - | - | 4.34 | - | - | 2.02 | - | - | ... | - | - | ... | - | - | 2.17 | - | - |
| 15 | 6.60 | - | - | 3.28 | - | - | 2.87 | - | - | ... | - | - | ... | - | - | 1.85 | - | - |
| 16 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 17 | 3.79 | - | - | ... | - | - | ... | - | - | 3.40 | - | - | ... | - | - | ... | - | - |
| 18 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | 4.92 | - | - | 1.27 | - | - |
| 19 | 3.45 | - | - | ... | - | - | ... | - | - | 6.24 | - | - | 2.20 | - | - | ... | - | - |
| 20 | ... | - | - | ... | - | - | 4.85 | - | - | 7.70 | - | - | ... | - | - | 1.37 | - | - |
| 21 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | 2.62 | - | - |
| 22 | ... | - | - | ... | - | - | 4.10 | - | - | ... | - | - | ... | - | - | ... | - | - |
| 23 | ... | - | - | 4.41 | - | - | ... | - | - | 3.27 | - | - | ... | - | - | ... | - | - |
| 24 | 7.53 | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 25 | 4.32 | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 26 | ... | - | - | ... | - | - | ... | - | - | 1.38 | - | - | ... | - | - | ... | - | - |
| 27 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | 1.35 | - | - |
| 28 | ... | - | - | 3.53 | - | - | 3.82 | - | - | ... | - | - | 2.20 | - | - | 2.31 | - | - |
| 29 | 7.84 | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 30 | 6.47 | - | - | ... | - | - | ... | - | - | 1.74 | - | - | 3.21 | - | - | ... | - | - |
| 31 | 2.54 | - | - | ... | - | - | ... | - | - | ... | - | - | 4.87 | - | - | ... | - | - |
| Mean | 5.70 | - | - | 3.68 | - | - | 3.94 | - | - | 4.10 | - | - | 3.01 | - | - | 2.65 | - | - |
| No. of days used | 9 | - | - | 7 | - | - | 8 | - | - | 11 | - | - | 7 | - | - | 13 | - | - |

| | JULY | | | AUGUST | | | SEPTEMBER | | | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|------------------|------|-------------|---|--------|-------------|---|-----------|-------------|---|---------|-------------|---|----------|-------------|---|----------|-------------|---|
| | F | λ^+ | i | F | λ^+ | i | F | λ^+ | i | F | λ^+ | i | F | λ^+ | i | F | λ^+ | i |
| 1 | ... | - | - | 1.55 | - | - | ... | - | - | ... | - | - | 4.06 | - | - | ... | - | - |
| 2 | ... | - | - | 1.53 | - | - | ... | - | - | 4.79 | - | - | ... | - | - | ... | - | - |
| 3 | 2.10 | - | - | ... | - | - | 2.05 | - | - | ... | - | - | ... | - | - | ... | - | - |
| 4 | ... | - | - | ... | - | - | 2.97 | - | - | ... | - | - | ... | - | - | 4.17 | - | - |
| 5 | 1.50 | - | - | ... | - | - | 2.46 | - | - | ... | - | - | ... | - | - | 3.69 | - | - |
| 6 | ... | - | - | ... | - | - | 1.65 | - | - | ... | - | - | 2.87 | - | - | 4.80 | - | - |
| 7 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | 3.02 | - | - | ... | - | - |
| 8 | ... | - | - | ... | - | - | ... | - | - | 3.03 | - | - | ... | - | - | ... | - | - |
| 9 | 0.99 | - | - | ... | - | - | ... | - | - | 3.26 | - | - | ... | - | - | ... | - | - |
| 10 | ... | - | - | ... | - | - | 2.65 | - | - | 3.08 | - | - | ... | - | - | ... | - | - |
| 11 | 2.27 | - | - | ... | - | - | 1.79 | - | - | 3.25 | - | - | ... | - | - | ... | - | - |
| 12 | ... | - | - | ... | - | - | ... | - | - | 4.31 | - | - | ... | - | - | 6.84 | - | - |
| 13 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 14 | ... | - | - | 3.54 | - | - | ... | - | - | ... | - | - | 4.49 | - | - | 11.24 | - | - |
| 15 | ... | - | - | 1.55 | - | - | ... | - | - | 4.05 | - | - | 3.45 | - | - | ... | - | - |
| 16 | ... | - | - | 1.02 | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 17 | ... | - | - | ... | - | - | 2.62 | - | - | ... | - | - | ... | - | - | 4.24 | - | - |
| 18 | ... | - | - | ... | - | - | ... | - | - | 5.43 | - | - | ... | - | - | 4.87 | - | - |
| 19 | ... | - | - | ... | - | - | 3.07 | - | - | ... | - | - | ... | - | - | ... | - | - |
| 20 | ... | - | - | 1.54 | - | - | ... | - | - | ... | - | - | 4.05 | - | - | ... | - | - |
| 21 | ... | - | - | 2.34 | - | - | 2.54 | - | - | ... | - | - | ... | - | - | 4.39 | - | - |
| 22 | ... | - | - | 2.40 | - | - | ... | - | - | 3.62 | - | - | 5.00 | - | - | ... | - | - |
| 23 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 24 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 25 | ... | - | - | ... | - | - | ... | - | - | 11.03 | - | - | ... | - | - | ... | - | - |
| 26 | 2.31 | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 27 | ... | - | - | 2.03 | - | - | ... | - | - | ... | - | - | 4.34 | - | - | ... | - | - |
| 28 | ... | - | - | ... | - | - | ... | - | - | ... | - | - | 4.54 | - | - | 5.82 | - | - |
| 29 | ... | - | - | 1.65 | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| 30 | ... | - | - | 3.14 | - | - | ... | - | - | 3.77 | - | - | 4.78 | - | - | ... | - | - |
| 31 | 1.78 | - | - | 0.77 | - | - | ... | - | - | ... | - | - | ... | - | - | ... | - | - |
| Mean | 1.83 | - | - | 1.92 | - | - | 2.42 | - | - | 4.51 | - | - | 4.06 | - | - | 5.56 | - | - |
| No. of days used | 6 | - | - | 12 | - | - | 9 | - | - | 11 | - | - | 10 | - | - | 9 | - | - |

Year: Mean 3.62
 No. of days used 112

ELECTRICAL CHARACTER OF EACH DAY AND APPROXIMATE DURATION OF NEGATIVE POTENTIAL GRADIENT

175 KEW OBSERVATORY

| | JANUARY | | FEBRUARY | | MARCH | | APRIL | | MAY | | JUNE | |
|------------------|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|
| | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient |
| 1 | 2 | 4.4 | 0 | ... | - | hr. | 1 | 2.7 | 2 | 3.1 | - | hr. |
| 2 | 2 | 12.9 | 1 | 1.5 | 1 | 1.6 | 1 | 0.7 | 1 | 1.8 | - | - |
| 3 | 0 | ... | 2 | 10.3 | 0 | ... | 1 | 0.9 | 1 | 0.3 | 0 | ... |
| 4 | 2 | 3.1 | 2 | 11.9 | 0 | ... | 1 | 2.8 | 1 | 2.7 | 0 | ... |
| 5 | 2 | 3.7 | 2 | 3.0 | 1 | 0.8 | - | - | 2 | 4.0 | 1 | 0.1 |
| 6 | 1 | 1.2 | 1 | 0.7 | 1 | 1.4 | - | - | - | - | 0 | ... |
| 7 | 0 | ... | 1 | 1.3 | 1 | 2.7 | - | - | - | - | 0 | ... |
| 8 | 2 | 3.9 | 2 | 4.1 | 1 | 0.7 | 2 | 4.1 | 1 | 1.6 | 0 | ... |
| 9 | 1 | 0.1 | 2 | 8.4 | 2 | 3.5 | 2 | 10.2 | 2 | 5.8 | 1 | 1.3 |
| 10 | 1 | 1.0 | 0 | ... | 2 | 5.0 | 2 | 3.4 | 1 | 0.4 | - | - |
| 11 | 2 | 6.7 | 2 | 9.5 | 1 | 2.7 | - | - | 0 | ... | - | - |
| 12 | 1 | 1.5 | 0 | ... | 1 | 1.4 | - | - | 1 | 0.6 | 1 | ... |
| 13 | 0 | ... | 2 | 11.2 | 2 | 7.0 | - | - | 1 | 0.1 | 0 | ... |
| 14 | 1 | 1.2 | 2 | 7.7 | 1 | 2.2 | 1 | 0.7 | 0 | ... | 0 | ... |
| 15 | 2 | 4.8 | 1 | 0.7 | 0 | ... | 0 | ... | 0 | ... | - | - |
| 16 | 1 | 1.1 | - | - | - | - | 1 | 0.1 | 2 | 4.1 | - | - |
| 17 | - | - | 2 | 9.9 | 1 | 0.7 | 1 | 0.3 | 1 | 2.9 | 0 | ... |
| 18 | 1 | 1.1 | 1 | 2.7 | 2 | 3.6 | 0 | ... | 1 | 1.0 | 1 | 1.0 |
| 19 | 0 | ... | 1 | 2.6 | - | - | 0 | ... | 1 | 0.5 | 1 | 2.3 |
| 20 | 0 | ... | 2 | 7.1 | - | - | 0 | ... | 2 | 5.9 | 0 | ... |
| 21 | 0 | ... | 1 | 2.3 | - | - | 0 | ... | 0 | ... | 1 | 0.2 |
| 22 | 1 | 0.1 | 1 | 1.1 | - | - | 0 | ... | - | - | 2 | 5.4 |
| 23 | 1 | 1.9 | 0 | ... | 1 | 2.6 | 0 | ... | 1 | 0.5 | 1 | 0.9 |
| 24 | 1 | 0.5 | 2 | 6.6 | 1 | 0.9 | 0 | ... | - | - | 1 | 0.1 |
| 25 | 1 | 0.1 | 2 | 8.1 | 1 | 2.3 | 0 | ... | - | - | 1 | 0.5 |
| 26 | 2 | 4.1 | 2 | 6.2 | 1 | 2.8 | 1 | 1.1 | 2 | 6.6 | 1 | 1.1 |
| 27 | 0 | ... | 1 | 2.5 | - | - | - | - | 2 | - | 0 | ... |
| 28 | 1 | 0.2 | - | - | - | - | 1 | 1.3 | 0 | ... | - | - |
| 29 | - | - | - | - | 1 | 0.7 | 2 | 5.1 | - | - | - | - |
| 30 | 0 | ... | - | - | 1 | 0.2 | 2 | 7.1 | 0 | ... | 0 | ... |
| 31 | 0 | ... | - | - | 1 | 2.1 | - | - | 0 | ... | - | - |
| Total | - | 53.6 | - | 119.4 | - | 44.9 | - | 40.5 | - | 41.9 | - | 12.9 |
| No. of days used | - | 29 | - | 26 | - | 23 | - | 23 | - | 24 | - | 21 |
| Mean | - | 1.8 | - | 4.6 | - | 2.0 | - | 1.8 | - | 1.7 | - | 0.6 |

| | JULY | | AUGUST | | SEPTEMBER | | OCTOBER | | NOVEMBER | | DECEMBER | |
|------------------|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|-----------|---|
| | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient | Character | Duration of negative potential gradient |
| 1 | 0 | hr. | 0 | hr. | 2 | hr. | 0 | hr. | 0 | hr. | - | hr. |
| 2 | 1 | 0.1 | 0 | ... | 0 | 5.5 | 0 | ... | 1 | 0.9 | 0 | ... |
| 3 | 0 | ... | 0 | ... | - | - | 0 | ... | 0 | ... | 2 | 3.3 |
| 4 | 1 | 0.8 | 1 | 0.1 | - | - | 1 | 0.5 | 2 | 12.6 | 0 | ... |
| 5 | 1 | 0.1 | 1 | 0.1 | - | - | 1 | 0.3 | 2 | 13.5 | 0 | ... |
| 6 | 0 | ... | 2 | 6.7 | 0 | ... | - | - | 1 | 2.1 | 1 | 2.1 |
| 7 | 0 | ... | - | - | 1 | 2.2 | 0 | ... | 1 | 2.9 | 1 | 0.4 |
| 8 | 1 | 0.2 | 0 | ... | 0 | ... | 0 | ... | 2 | 3.2 | 2 | 3.6 |
| 9 | 1 | 0.3 | 1 | 2.9 | 0 | ... | 0 | ... | - | - | 1 | 0.8 |
| 10 | 1 | 0.2 | 0 | ... | 1 | 2.3 | 0 | ... | 2 | 4.6 | 1 | 0.2 |
| 11 | 1 | 0.9 | 1 | 1.2 | 1 | 0.1 | 1 | 0.1 | 1 | 0.7 | 0 | ... |
| 12 | 2 | 3.1 | 1 | 1.6 | 1 | 0.7 | 0 | ... | 1 | 2.1 | 0 | ... |
| 13 | 1 | 0.4 | 1 | 0.4 | 1 | 0.8 | 1 | 0.7 | 1 | 0.4 | 0 | ... |
| 14 | 0 | ... | 1 | 1.9 | 0 | ... | 1 | 0.2 | 1 | 0.5 | 0 | ... |
| 15 | 0 | ... | 0 | ... | 1 | 1.3 | 1 | 0.1 | 1 | 0.8 | 0 | ... |
| 16 | 0 | ... | 1 | 0.3 | 1 | 2.1 | 1 | 0.7 | 1 | 0.9 | 0 | ... |
| 17 | 0 | ... | 1 | 0.1 | 0 | ... | 2 | 3.0 | - | - | 0 | ... |
| 18 | 0 | ... | 0 | ... | 0 | ... | 0 | ... | 2 | 12.3 | - | - |
| 19 | 1 | 0.1 | 2 | 3.0 | 0 | ... | 1 | 0.6 | - | - | 1 | 0.2 |
| 20 | 0 | ... | 1 | 1.7 | 1 | 0.2 | 0 | ... | 2 | 5.9 | - | - |
| 21 | 0 | ... | 0 | ... | 0 | ... | 1 | 1.4 | 1 | 1.2 | 2 | 5.4 |
| 22 | 1 | 2.1 | 0 | ... | 0 | ... | 2 | 5.6 | 0 | ... | - | - |
| 23 | 2 | 4.3 | 1 | 0.2 | 1 | 0.5 | 0 | ... | 2 | 4.2 | - | - |
| 24 | 0 | ... | 0 | ... | 0 | ... | 0 | ... | - | - | 1 | 1.8 |
| 25 | 1 | 0.2 | 0 | ... | 1 | 2.7 | 0 | ... | 1 | 0.5 | 1 | 0.8 |
| 26 | 0 | ... | 1 | 2.6 | 1 | 0.3 | - | - | 0 | ... | 0 | ... |
| 27 | 0 | ... | 1 | 2.2 | 2 | 5.6 | - | - | 0 | ... | 2 | 4.6 |
| 28 | - | - | - | - | 1 | 0.7 | - | - | 1 | 0.4 | 2 | 6.4 |
| 29 | 0 | ... | 1 | 0.1 | 0 | ... | - | - | 1 | 1.3 | 2 | 5.4 |
| 30 | 1 | 0.7 | 1 | 1.3 | 0 | ... | - | - | 0 | ... | 1 | 0.3 |
| 31 | 1 | 2.4 | 1 | 1.5 | - | - | - | - | - | - | 1 | 0.2 |
| Total | - | 15.9 | - | 27.9 | - | 25.0 | - | 13.2 | - | 71.0 | - | 35.5 |
| No. of days used | - | 30 | - | 29 | - | 27 | - | 24 | - | 26 | - | 26 |
| Mean | - | 0.5 | - | 1.0 | - | 0.9 | - | 0.6 | - | 2.7 | - | 1.4 |

Annual values: Character 0 1 2
No. of days 112 138 58

Duration: Total 501.7 hr.
No. of days 308
Mean 1.02 hr.

POTENTIAL GRADIENT (reduced to level surface, Paddock site)
 Kelvin electrograph standardized by Wilson readings, underground laboratory
 Mean values for periods of sixty minutes between exact hours, G.M.T.

176 KEW OBSERVATORY

| | JANUARY, factor 4.22 | | | | FEBRUARY, factor 4.22 | | | | MARCH, factor 4.33 | | | |
|------|------------------------|-------|---------|---------|-----------------------|-------|---------|---------|--------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 220 | Z± | 695 | Z± | 875 | 770 | 630 | 615 | - | - | 480 | 610 |
| 2 | 170 | Z± | -260 | -410 | 155 | 245 | 180 | 25 | 310 | 390 | 310 | 665 |
| 3 | 230 | 670 | 970 | 775 | 105 | Z- | -335 | 720 | 495 | 480 | 470 | 545 |
| 4 | Z± | 815 | Z± | 580 | 245 | -605 | Z± | 295 | 325 | 440 | 560 | 700 |
| 5 | 220 | 180 | -25 | 685 | 155 | 335 | Z± | 860 | 285 | 935 | 545 | 130 |
| 6 | 205 | 180 | 260 | 295 | 425 | 810 | 705 | 810 | 170 | 415 | -155 | 625 |
| 7 | 295 | 540 | 360 | 750 | 540 | 965 | 490 | 500 | -285 | 325 | 155 | 375 |
| 8 | 205 | 220 | -605 | 710 | 130 | 465 | 630 | 550 | 365 | 545 | 415 | 310 |
| 9 | 180 | 645 | 605 | 800 | Z± | 490 | Z± | 795 | 210 | 180 | 440 | 535 |
| 10 | 480 | 425 | Z± | 735 | 525 | 680 | 670 | 165 | -235 | 625 | 545 | 455 |
| 11 | -360 | -270 | Z± | 490 | 65 | -730 | -115 | 940 | 130 | 310 | 625 | 325 |
| 12 | 335 | 440 | 360 | 505 | 370 | 460 | 335 | 695 | 180 | 495 | 310 | 625 |
| 13 | 515 | 450 | 385 | 810 | 490 | 350 | -295 | -580 | 235 | 495 | Z± | -80 |
| 14 | 515 | 490 | -195 | 750 | -25 | -140 | 230 | 770 | -285 | 220 | 300 | 375 |
| 15 | -360 | 760 | 350 | 800 | 245 | 425 | 425 | 630 | 180 | 325 | 220 | 210 |
| 16 | 750 | 850 | 840 | 490 | 385 | -1210 | - | - | - | - | 65 | -105 |
| 17 | 130 | 155 | 440 | 425 | 205 | Z- | 490 | 540 | -65 | 180 | 210 | 195 |
| 18 | 105 | 320 | 350 | 440 | 220 | 230 | 280 | Z+ | 145 | 310 | -365 | 495 |
| 19 | 285 | 410 | 285 | 425 | 65 | 670 | 450 | 770 | Z± | Z± | Z± | 560 |
| 20 | 140 | 285 | 320 | 570 | 465 | 65 | Z- | 745 | - | - | 495 | 910 |
| 21 | 360 | 285 | 310 | 700 | Z± | 720 | 540 | 940 | 480 | 440 | 245 | - |
| 22 | 100 | 630 | 480 | 530 | 565 | 745 | Z± | 785 | - | 285 | 235 | - |
| 23 | Z± | 410 | 335 | 335 | 360 | 475 | 400 | 615 | 115 | 145 | 15 | 310 |
| 24 | 260 | 410 | 610 | 530 | 435 | 280 | 615 | -385 | 260 | 350 | -350 | 310 |
| 25 | 385 | 335 | 295 | 400 | -115 | -875 | 400 | 320 | 310 | 440 | 210 | 365 |
| 26 | 310 | Z± | - | 670 | 220 | 975 | -1105 | Z± | 480 | 270 | -50 | 105 |
| 27 | 735 | 700 | 450 | 865 | -115 | 310 | 679 | 360 | 270 | 300 | - | - |
| 28 | 335 | 245 | 450 | 555 | 335 | 450 | 410 | - | - | - | 310 | 350 |
| 29 | 310 | - | 790 | 1185 | - | - | - | - | 340 | 495 | 600 | 520 |
| 30 | 1495 | 1650 | 620 | 530 | - | - | - | - | 310 | 545 | 405 | 895 |
| 31 | 385 | 710 | 285 | 840 | - | - | - | - | 285 | 470 | -505 | 805 |
| (a) | 358 | 508 | 472 | 627 | 330 | 520 | 475 | 611 | 280 | 400 | 355 | 473 |
| (b) | 339 | 503 | 357 | 617 | 277 | 323 | 401 | 425 | 183 | 404 | 223 | 449 |
| Mean | (a) 491 (b) 454 | | | | (a) 484 (b) 357 | | | | (a) 377 (b) 315 | | | |

| | APRIL, factor 4.23 | | | | MAY, factor 3.92 | | | | JUNE, factor 4.15 | | | |
|------|------------------------|-------|---------|---------|------------------|-------|---------|---------|-------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 270 | 180 | 260 | 440 | 375 | Z- | 385 | 575 | 225 | - | 325 | 465 |
| 2 | 230 | 390 | 320 | 490 | 160 | 250 | 75 | 475 | - | 275 | 165 | 190 |
| 3 | 450 | 480 | 270 | 440 | 310 | 560 | 500 | 650 | 165 | 450 | 200 | 115 |
| 4 | 170 | 105 | 285 | 735 | 375 | 650 | Z± | 500 | 200 | 515 | 440 | 375 |
| 5 | 505 | 540 | 285 | - | 425 | Z- | Z± | 625 | 250 | 550 | 325 | 290 |
| 6 | - | - | 205 | 65 | 360 | 275 | - | - | 275 | 705 | 290 | 450 |
| 7 | 245 | 335 | Z± | 25 | - | 250 | 200 | 325 | 340 | 415 | 415 | 390 |
| 8 | 50 | 245 | 390 | 25 | 200 | 275 | 275 | 400 | 275 | 475 | 325 | 315 |
| 9 | 260 | Z± | Z± | 205 | 100 | 200 | 125 | -300 | 365 | 300 | -275 | 325 |
| 10 | 230 | 515 | Z± | 400 | 125 | 110 | 250 | 275 | 200 | - | - | - |
| 11 | 335 | 570 | - | - | 185 | 450 | 700 | 425 | - | 315 | 250 | 175 |
| 12 | - | - | - | - | 425 | 150 | 150 | - | 125 | 140 | 175 | 150 |
| 13 | - | - | 505 | 660 | 135 | 475 | 225 | 100 | 125 | 175 | 150 | 275 |
| 14 | 415 | 320 | 310 | 645 | 85 | 225 | 200 | 225 | 190 | 240 | - | 250 |
| 15 | 645 | 725 | 245 | 450 | 160 | 175 | 135 | 200 | - | - | - | - |
| 16 | 285 | 390 | 105 | 515 | -75 | 175 | 275 | 375 | - | - | 115 | 100 |
| 17 | 270 | 480 | 270 | 335 | 200 | 275 | Z± | 375 | 250 | - | 140 | 150 |
| 18 | 270 | 490 | 465 | 515 | 360 | 550 | 485 | 525 | 175 | 240 | 100 | 150 |
| 19 | 180 | 700 | 595 | 450 | 325 | 475 | 200 | 350 | 225 | 225 | -50 | 250 |
| 20 | 400 | 700 | 620 | 465 | 110 | 260 | 200 | -1095 | 190 | 225 | 150 | 225 |
| 21 | 310 | 515 | 440 | 505 | 110 | 300 | 425 | 260 | 650 | 515 | 265 | 415 |
| 22 | 195 | 415 | 490 | 400 | 510 | - | 175 | 325 | Z± | 290 | 200 | 215 |
| 23 | - | - | 300 | 310 | 225 | - | 250 | - | 75 | 165 | 150 | 150 |
| 24 | 285 | 490 | 260 | 440 | 275 | 325 | 175 | 360 | 25 | 190 | 125 | 215 |
| 25 | 505 | 645 | 285 | 320 | 350 | 575 | Z± | -275 | 150 | 265 | 125 | Z± |
| 26 | 350 | 270 | 105 | 360 | Z± | 75 | 100 | 150 | 240 | 165 | 25 | 50 |
| 27 | 180 | 285 | Z± | 115 | 575 | 100 | 85 | 400 | 175 | 265 | 100 | 265 |
| 28 | 205 | 350 | 155 | -180 | 575 | 745 | 160 | 650 | 140 | 175 | 140 | 200 |
| 29 | 205 | - | 0 | -25 | 250 | - | 560 | 550 | - | - | 425 | 315 |
| 30 | 0 | 80 | 195 | 375 | 285 | 475 | 360 | 525 | 325 | 450 | 150 | 90 |
| 31 | - | - | - | - | 350 | 528 | 425 | 460 | - | - | - | - |
| (a) | 286 | 426 | 307 | 387 | 283 | 342 | 273 | 403 | 223 | 322 | 211 | 243 |
| (b) | 289 | 419 | 319 | 407 | 229 | 350 | 278 | 277 | 228 | 334 | 168 | 247 |
| Mean | (a) 352 (b) 359 | | | | (a) 325 (b) 284 | | | | (a) 250 (b) 244 | | | |

The potential gradient is reckoned as positive if the potential increases upwards. For indeterminate potential gradient the following notation is used: Z+, indeterminate, positive value; Z-, indeterminate, negative value; Z±, indeterminate, in magnitude and sign.

(a) Mean of all positive readings.

(b) Mean from all complete days using both positive and negative readings.

POTENTIAL GRADIENT (reduced to level surface, Paddock site)
 Kelvin electrograph standardized by Wilson readings, underground laboratory
 Mean values for periods of sixty minutes between exact hours, G.M.T.

176 KEW OBSERVATORY

| | JULY, factor 3.85 | | | | AUGUST, factor 4.20 | | | | SEPTEMBER, factor 4.19 | | | |
|------|------------------------|-------|---------|---------|---------------------|-------|---------|---------|------------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 70 | 115 | 105 | 150 | 180 | 280 | 205 | 270 | 415 | 390 | Z± | 25 |
| 2 | 140 | 290 | 185 | 205 | 180 | 345 | 165 | 310 | 260 | 490 | 245 | 220 |
| 3 | 105 | 250 | 185 | 140 | 245 | 230 | 205 | 345 | 220 | 235 | - | - |
| 4 | 205 | 195 | 220 | 250 | 260 | 245 | 220 | 140 | - | - | - | - |
| 5 | 335 | 320 | 355 | 205 | 155 | 230 | 165 | 245 | - | - | 480 | 440 |
| 6 | 205 | 220 | 140 | 230 | 155 | 205 | -165 | 75 | 180 | 80 | 310 | 300 |
| 7 | 230 | 205 | 150 | 250 | 205 | 155 | 195 | Z± | 235 | 205 | 480 | 400 |
| 8 | 125 | 230 | 140 | 265 | 230 | 335 | 75 | 270 | 260 | 480 | 415 | 350 |
| 9 | 185 | 250 | 150 | 70 | 105 | 205 | Z± | 270 | 155 | 195 | 205 | 155 |
| 10 | 115 | 220 | 195 | 250 | 180 | 195 | 195 | 335 | 80 | 205 | 180 | 115 |
| 11 | 160 | 250 | 240 | Z± | 310 | 360 | 75 | 25 | 90 | 130 | 25 | 130 |
| 12 | 205 | 265 | 160 | Z± | 15 | 230 | Z± | 385 | 40 | 65 | 270 | 400 |
| 13 | 115 | 175 | 160 | 185 | 270 | 425 | 230 | 605 | 205 | 180 | 310 | 270 |
| 14 | 275 | 345 | 140 | 240 | 335 | 385 | 270 | 360 | 205 | 205 | 235 | 300 |
| 15 | 185 | 125 | 105 | 140 | 230 | 490 | 180 | 280 | 155 | -325 | 130 | 455 |
| 16 | 160 | 250 | 140 | 220 | 130 | 475 | 140 | 155 | 440 | 440 | 140 | 260 |
| 17 | 115 | 370 | 140 | 115 | 90 | 260 | 90 | 205 | 220 | 425 | 235 | 360 |
| 18 | 265 | 250 | 80 | 275 | 270 | 140 | 180 | 155 | 310 | 390 | 310 | 335 |
| 19 | 45 | 160 | 150 | 205 | 0 | 180 | 140 | 335 | 220 | 335 | 220 | 235 |
| 20 | 160 | 275 | 140 | 230 | 295 | 360 | 195 | 370 | 205 | 490 | 180 | 205 |
| 21 | 160 | 205 | 265 | 665 | 320 | 310 | 230 | 140 | 105 | 270 | 205 | 325 |
| 22 | 220 | 205 | Z± | Z± | 105 | 75 | 230 | 195 | 285 | 310 | 235 | 220 |
| 23 | 115 | 150 | 0 | -140 | 260 | 540 | 140 | 180 | 245 | 0 | 155 | 170 |
| 24 | 115 | 290 | 140 | 160 | 205 | 230 | 130 | 235 | 130 | 310 | 220 | 260 |
| 25 | 160 | 345 | 115 | 70 | 230 | 385 | 165 | 115 | 130 | 90 | 65 | 520 |
| 26 | 80 | 250 | 90 | 140 | Z± | 180 | 155 | 230 | 235 | 490 | 235 | 335 |
| 27 | 125 | 250 | 220 | 520 | 180 | 130 | Z± | 205 | 325 | 205 | 300 | Z± |
| 28 | 205 | 300 | 140 | 140 | 140 | 25 | - | - | 155 | 220 | 260 | 350 |
| 29 | 185 | 240 | 195 | 240 | 25 | 25 | 180 | 280 | 260 | 620 | 270 | 335 |
| 30 | 265 | 450 | 300 | 300 | 165 | 245 | 180 | 370 | 130 | 310 | 205 | 220 |
| 31 | Z± | 125 | 250 | 205 | 205 | Z± | Z± | 540 | | | | |
| (a) | 168 | 244 | 167 | 225 | 189 | 263 | 173 | 263 | 211 | 288 | 241 | 285 |
| (b) | 165 | 249 | 161 | 212 | 201 | 290 | 159 | 250 | 197 | 264 | 230 | 289 |
| Mean | (a) 201 (b) 197 | | | | (a) 222 (b) 225 | | | | (a) 256 (b) 245 | | | |

| | OCTOBER, factor 4.35 | | | | NOVEMBER, factor 4.05 | | | | DECEMBER, factor 4.13 | | | |
|------|------------------------|-------|---------|---------|-----------------------|-------|---------|---------|-----------------------|-------|---------|---------|
| | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. | 2-3h. | 8-9h. | 14-15h. | 20-21h. |
| | <i>volts per metre</i> | | | | | | | | | | | |
| 1 | 185 | 175 | 250 | 370 | 200 | 385 | 385 | 620 | - | - | 450 | 485 |
| 2 | 210 | 385 | 410 | 370 | 345 | 320 | 320 | 790 | 450 | 565 | 510 | 525 |
| 3 | 225 | 440 | 385 | 425 | 520 | 755 | 310 | 580 | 360 | 575 | Z- | 360 |
| 4 | 55 | 305 | 240 | 280 | 295 | -25 | -755 | -50 | 205 | 335 | 435 | 500 |
| 5 | 80 | 200 | 370 | 160 | -35 | 35 | -310 | Z- | 180 | 310 | - | 280 |
| 6 | 95 | 400 | - | 410 | 10 | 175 | 320 | 320 | 200 | 510 | 385 | 755 |
| 7 | 280 | 185 | 360 | 400 | 445 | 210 | 295 | 320 | 180 | 625 | 705 | 625 |
| 8 | 265 | 400 | 225 | 370 | 220 | 75 | 125 | 235 | 140 | 165 | -255 | 180 |
| 9 | 385 | 425 | 320 | 505 | 295 | - | 60 | 25 | 190 | 255 | 310 | 400 |
| 10 | 320 | 530 | 265 | 680 | 150 | 125 | 495 | -150 | 100 | 230 | 450 | 410 |
| 11 | 40 | 210 | 290 | 705 | -125 | 160 | 270 | 345 | 625 | 485 | 510 | 795 |
| 12 | 200 | 610 | 410 | 545 | 220 | 210 | Z+ | 150 | 655 | 640 | 740 | 795 |
| 13 | 160 | 95 | 185 | 225 | 35 | 295 | 360 | 185 | 715 | - | 435 | 1025 |
| 14 | 135 | 185 | 320 | 400 | 50 | 345 | 295 | 210 | 1050 | 935 | 795 | 435 |
| 15 | 370 | 810 | 480 | 160 | 125 | 50 | 320 | 595 | 75 | 25 | 435 | 435 |
| 16 | 720 | - | 385 | 1010 | 85 | 110 | 310 | 260 | 320 | 230 | 385 | 280 |
| 17 | 865 | Z- | 450 | 600 | Z± | Z± | - | - | 370 | 345 | 400 | 320 |
| 18 | 240 | 400 | 520 | 585 | 10 | -100 | Z- | 705 | 205 | 335 | - | - |
| 19 | 410 | 400 | 505 | 240 | - | - | 295 | 640 | - | - | 310 | 485 |
| 20 | 185 | 240 | 370 | 450 | 185 | 420 | 320 | Z- | 255 | 255 | - | 230 |
| 21 | 135 | 400 | 320 | 585 | 150 | 320 | -35 | 445 | -230 | 0 | 590 | 310 |
| 22 | 425 | 345 | -210 | 425 | 175 | 310 | 345 | 260 | 335 | 435 | - | - |
| 23 | 530 | 770 | 440 | 385 | -250 | 470 | 470 | 270 | - | - | 75 | 245 |
| 24 | 530 | 680 | 745 | 490 | - | - | 130 | -445 | 115 | 100 | 140 | 100 |
| 25 | 330 | 610 | 600 | 585 | 250 | 345 | 235 | 250 | 190 | 335 | 500 | 780 |
| 26 | 425 | 240 | - | - | 520 | 765 | 420 | 530 | 615 | 795 | 475 | 945 |
| 27 | - | - | - | - | 385 | 470 | 360 | 505 | Z- | 510 | 540 | 525 |
| 28 | - | - | - | - | 175 | 495 | 310 | 270 | 50 | 450 | 485 | Z- |
| 29 | - | - | - | - | 320 | 360 | 360 | 545 | 360 | -385 | - | 680 |
| 30 | - | - | - | - | 220 | 250 | - | - | 625 | 205 | 295 | 485 |
| 31 | - | - | - | 570 | - | - | - | - | 295 | 870 | 820 | 730 |
| (a) | 300 | 393 | 385 | 459 | 224 | 311 | 309 | 394 | 341 | 405 | 466 | 504 |
| (b) | 259 | 400 | 355 | 425 | 194 | 310 | 263 | 349 | 325 | 403 | 454 | 516 |
| Mean | (a) 384 (b) 360 | | | | (a) 310 (b) 279 | | | | (a) 429 (b) 425 | | | |

The factor used for converting the potential at the collector to potential gradient in volts per metre in the open is given for each month.

| Annual means (a) | 266 | 369 | 320 | 406 |
|------------------|---------|-----|---------|-----|
| (b) | 241 | 354 | 281 | 372 |
| | (a) 340 | | (b) 312 | |

