

METEOROLOGICAL OFFICE.

BRITISH METEOROLOGICAL AND MAGNETIC YEAR BOOK, 1919,
PART III., SECTION 2.

GEOPHYSICAL JOURNAL, 1919,

COMPRISING

DAILY VALUES OF THE METEOROLOGICAL AND GEOPHYSICAL ELEMENTS
AT THREE OBSERVATORIES OF THE METEOROLOGICAL OFFICE;
DAILY VALUES OF SOLAR RADIATION AT SOUTH KENSINGTON;
WIND COMPONENTS AT FIXED HOURS AT FOUR ANEMOGRAPH STATIONS;
TABULATIONS OF OCCASIONAL SOUNDINGS OF THE UPPER AIR;
AND RESULTS OF OBSERVATIONS OF CLOUD AND AURORA;

TOGETHER WITH AN ANNUAL SUPPLEMENT.

Published by Authority of the Meteorological Committee.



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METEOROLOGICAL OFFICE.

BRITISH METEOROLOGICAL AND MAGNETIC YEAR-BOOK: GEOPHYSICAL JOURNAL.

INTRODUCTION TO THE TABLES FOR 1919.

THE Geophysical Journal gives daily values for the meteorological and geophysical elements observed at the three observatories of the Meteorological Office (Kew Observatory, Richmond, Surrey; Valencia Observatory, Cahirciveen, Co. Kerry; and Eskdalemuir Observatory, Dumfriesshire) and at the St Louis Observatory, Jersey. Data are given for Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology. Wind components are given for four additional anemograph stations.

The results of ascents at Upper Air Stations at Aberdeen, Eskdalemuir, Cahirciveen, South Farnborough, and Falmouth, together with nephoscope observations made at Aberdeen, and tables showing the occurrences of Aurora, are included in the Journal.

Greenwich Mean Time is used in all cases, and the hours are counted from midnight and numbered 0 to 23; the second midnight of the day is referred to as 24 h.

All the units employed are based on the C.G.S. system. Data to which the letters *x* and *n* are attached represent the maximum and minimum values in the column.

The tables are as follows:—

1. **Sunshine and Solar Radiation.** The total number of hours of bright sunshine as measured by the Campbell-Stokes Recorder is given for Westminster,* Richmond, Eskdalemuir, and Cahirciveen; also the percentage this represents of the "possible," regarded as the number of hours from sunrise to sunset. The Campbell-Stokes instrument records only bright sunshine, no trace being obtained in thick haze or when the sun is very near the horizon. Thus the total it gives is less than the number of hours during which the position of the sun is visible to the naked eye. While the result is somewhat arbitrary, the records from different instruments of this pattern show a close agreement. The "normal" values for Westminster, Richmond and Cahirciveen are from the 35 years 1881 to 1915; those for Eskdalemuir from the 5 years 1911 to 1915.

Solar radiation results are given for South Kensington, Richmond (Kew Observatory), and Eskdalemuir. At the two latter stations use is made of the Ångström pyrheliometer, which gives the intensity of the radiation received from the

* The exposure of the recorder at South Kensington was interrupted by building operations at the end of September 1918, and the record made at the Wesleyan Training College, Westminster, has been tabulated since that date.

sun by a surface which is normal to the line drawn from the instrument to the sun. At Richmond the observations are made within half an hour of noon; for this observatory the vertical component of the radiation, *i.e.* the intensity multiplied by the cosine of the zenith distance of the sun, is tabulated to facilitate comparison with the South Kensington records. The hour of the pyrheliometric observation at Eskdalemuir is given explicitly; the value is also given of $(p/p_0) \sec Z$, where p is the barometric pressure at the observatory in millibars at the time of the observation, p_0 is 1000 millibars, and Z is the zenith distance of the sun, so that $(p/p_0) \sec Z$ affords a measure of the mass of atmosphere through which the solar radiation has had to travel before reaching the earth. The entries in the columns headed "sky" at Richmond and Eskdalemuir are intended to show the presence or absence of any visible obstruction, such as haze, mist, or cloud, in the direct path of the solar radiation recorded. Observations are taken so far as possible in the absence of cloud; but upper cloud, when there is a great deal of it, cannot always be avoided, and, unless the cloud is very thin, the fall in the radiation recorded is conspicuous.

At South Kensington the radiation is measured by the Callendar Radiograph, which records the amount received on a horizontal surface from all sources. In bright sunshine the greater part of the radiation consists of the vertical component of the direct solar radiation, but even then an appreciable part comes from the general atmosphere and from clouds. Thus if a Callendar and an Ångström instrument were simultaneously recording side by side, one would naturally expect the radiation recorded by the former to exceed the vertical component of that recorded by the latter.

The intensity of radiation, whether at South Kensington, Richmond, or Eskdalemuir, is expressed in milliwatts per square centimetre. For conversion to the unit more ordinarily employed abroad, we may use

$$1 \text{ mw. per sq. cm.} = 0.01435 \text{ gramme-calorie per sq. cm. per minute.}$$

At South Kensington two measurements are given for the maximum radiation—the highest value shown on the trace of the Callendar instrument at whatever hour it occurs, and also the highest value recorded between 11 h. 30 m. and 12 h. 30 m. It is the latter that is most appropriate for comparison with Richmond. The daily total radiation at South Kensington, representing the integrated value of the radiation throughout the 24 hours, is also given, being expressed in joules (j) per sq. cm. A watt equals 1 joule per second, and therefore a uniform radiation at the rate of 1 milliwatt amounts in 24 hours to 86.4 joules. The daily total at South Kensington is also expressed as a percentage of the "planetary" radiation, *i.e.* the radiation that would be received if the earth's atmosphere were non-existent, assuming the average intensity of direct solar radiation in space at the earth's mean distance from the sun to be 135 milliwatts per sq. cm. This accepts Dr. Abbot's result, 1.93 gramme calories per sq. cm.; but it should be remembered that the scales of the Callendar and Ångström* instruments undoubtedly differ from that accepted at Washington.

2. Meteorology and Magnetism:—Cahirciveen (Valencia Observatory). This table is in the form adopted for Part III., Section I., of the Year-Book (Daily Readings at Meteorological Stations of the First and Second Orders). Pressure, temperature

* Ångström No. 24 was in use at Richmond during the year 1919. It is hoped that a discussion of a comparison between the scale of this instrument and that of an Abbot silver disc pyrheliometer will be published shortly.

wind velocity, and rainfall are taken from the self-recording instruments at the observatory. Some account of these instruments will be found in the Introduction to Hourly Values from Autographic Records, Meteorological Section, 1913. It may be noted here that the temperatures refer to a large louvred screen on the north wall of the Observatory, not to the Stevenson Screen, which contains the thermometers used for the observations printed in the Daily Weather Report.*

Pressure is given in "millibars" (1000 millibars = one megadyne per square centimetre). One millibar is approximately equivalent to the pressure of 0·75008 mm. or 0·02953 inch of mercury under standard conditions (273a, lat. 45°). Conversion Tables will be found in Hourly Values from Autographic Records, 1913, and in the Computer's Handbook. The necessary reductions of the readings of the barometer on account of temperature and latitude have been made.

Temperatures are given in units on the Kelvin Absolute Scale, i.e. in centigrade degrees measured from a zero 273° below the normal Freezing Point of water.† Temperatures at or below 273a (0° C.) are printed in small type. The extreme temperatures refer to the calendar day.‡

Vapour-Pressure, deduced from the readings of the dry and wet bulb thermometers, is given in millibars. For the computation of Vapour Pressure and of Relative Humidity tables depending on Glaisher's hypothesis, that the depression of the wet-bulb readings below the air-temperature is proportional to the depression of the dew point below the same temperature, are utilised.

Wind-Speed is expressed in metres per second. The values are estimated for periods of 60 minutes centering at the hours named. The Robinson anemograph § (9-inch cups, 24-inch arms, factor 2·2) is used for this purpose.

Wind-Direction in the present volume is given by the deviation from North, reckoned in degrees as a "veer," in the sense N, E, S, W. The general direction for the 60 minutes is estimated from the anemogram.|| No direction is given when the anemogram shows a mean velocity for the hour smaller than 1·6 metres per second.

Precipitation is given in millimetres of equivalent rainfall. The rainfall is for the calendar day; previous to May 1st, 1914, the period was the 24 hours beginning at 10 h. 30 m., and from that date to the end of 1917 the 24 hours beginning at 9 h.†

The "normals" for Pressure, Temperature, and Precipitation are from the 45 years 1871 to 1915; those for Humidity from the 30 years 1886 to 1915; and those for Wind from the 35 years 1881 to 1915. Except in the case of Pressure, no allowance has been made for the removal of the observatory from Valencia Island to Cahirciveen in 1892.

The estimation of **cloud** amount and the symbols for **weather** are in accordance with the conventions of the International Meteorological Committee.

A summary of the weather for each day is given in the column headed **Remarks**, the international weather symbols and the letters of the Beaufort Notation being used as far as possible. These symbols and letters are as follows:—

* At Richmond and at Eskdalemuir the thermograph screens contain the thermometers used for the Daily Weather Service.

† The propriety of the definition has been discussed by F. J. W. Whipple, *Lond. Phys. Soc. Proc.*, vol. xxxi, 1919, p. 240.

‡ Extreme temperatures and rainfall for the 24 hours to 7 h. are printed in the Daily Weather Report and utilised in the Weekly Weather Report. For the Monthly Weather Report the figures of this Journal are used.

§ See below, p. vi.

|| Formerly it was the practice to take the direction at the exact hour. The present rule was adopted as from 1st May 1915. The Introductions to the *Geophysical Journal*, 1915, 1916, should be amended in this sense.

BEAUFORT NOTATION AND INTERNATIONAL WEATHER SYMBOLS.

b. blue sky. (Cloud amt. 0, 1, 2, 3)	x. ↘ hoar frost.	h. ▲ hail.
bc. some cloud. , , 4, 5, 6	← ice crystals.	△ soft hail.
c. cloudy. , , 7, 8	▽ rime.	t. T thunder.
o. overcast. , , 9, 10)	~ glazed frost.	l. ⚡ lightning.
g. gloomy, dull appearance.	e. water deposited copiously on exposed surfaces, without rain falling.	K thunderstorm.
u. ugly, threatening appearance.	y. dry air.	↗ gale.
v. visibility, unusually clear atmosphere.	p. passing showers.	q. squally.
z. ∞ haze.	d. drizzling rain.	○ solar corona.
m. ≡ ⁰ mist, light fog.	r. ● rain.	⊕ solar halo.
f. ≡ fog.	s. * snow.	Ψ lunar corona.
fe. ≡ wet fog, i.e. fog which deposits water copiously on exposed surfaces.	↗ snow drift.	Ω lunar halo.
w. ⚪ dew.	☒ snow lying (more than half the surrounding country covered with snow).	~ rainbow.
		⚡ aurora.
		■ zodiacal light.

The figure ⁰ attached to a symbol indicates very slight, whilst the figure ² indicates strong or heavy: thus ●⁰=slight rain, ●²=heavy rain. When economy of space is necessary, morning, afternoon, and night are denoted by a., p., n. respectively. ↗ is only used in the Remarks Column when the wind as recorded by the anemometer averages 17·2 m/s or more for at least an hour.

Table 2 also contains results for **Magnetic Horizontal Force, Declination, and Inclination** from absolute observations, usually two a month. The observations* are made at fixed hours on days not subject to abnormal magnetic disturbance, and may be regarded as referring: Horizontal Force to 11 h. 35 m., Declination to 10 h. 20 m., and Inclination to 14 h. 30 m. The unit of force employed, 1γ, represents 0·00001 C.G.S. magnetic unit. It is equal to the magnetic force due to an electrical current of 5 amperes in an infinitely long straight conductor a kilometre away. A memorandum by Dr. Chree on the probable errors in absolute observations of the magnetic elements is printed with the Introduction to the Geophysical Journal 1918.

Tables 3 and 4 contain corresponding observations for **Richmond (Kew Observatory)** and **Eskdalemuir, Dumfriesshire**, with the exception of the magnetic data. At Eskdalemuir the velocity of the wind is determined from the readings of a Dines Pressure-tube Anemograph. The periods from which the Richmond normal values are derived are: Pressure and Temperature 1871 to 1915, Humidity 1886 to 1915, Wind 1881 to 1915, and Rain 1871 to 1915. The "normals" for Eskdalemuir all refer to the 5 years 1911 to 1915.

5. Geophysics, Richmond (Kew Observatory). In addition to magnetic and electrical data, this Table contains the readings at 9 h. of thermometers placed in iron tubes in the ground with their bulbs at depths of 30 cm. and 120 cm. below the surface. The mean level of underground water is also given for each day, together with the highest and lowest levels recorded during the month. A description of the apparatus used will be found in the Annual Supplement for 1914. The variation of level through the year is shown by a graph which faces p. 108.

Magnetic Data for Richmond (Kew Observatory). The magnetic data published in the Geophysical Journal up to 1915 were maxima and minima derived from measurements of the magnetograms. The adoption by the London and South-Western Railway of electric traction for the line which passes some 1000 m. from the observatory has made the records useless for the determination of extreme values. The results of absolute observations* taken usually four times a month are now given.

* Notes on the observations are to be published in Hourly Values from Autographic Records, 1919.

The magnetic character of the day is determined by examination of the magnetograms, and is given on the scale approved by the International Magnetic Commission, "0" representing quiet, "1" moderately disturbed, and "2" highly disturbed conditions.

Values of the **Electrical Potential Gradient** in the open are given for 3 h., 9 h., 15 h., and 21 h., representing means for the sixty minutes centering at the hour. A factor, whose value is given, is applied to the electrograph curve readings to deduce the corresponding potential gradient in the open, *i.e.* the potential gradient as it would be if unaffected by the presence of buildings or apparatus. The gradient is measured in volts per metre. It is positive when the potential in the atmosphere exceeds that of the earth. A negative value is indicated by a short thick "—" before the number. When the fluctuations of potential are too large or rapid to permit of a satisfactory numerical estimate of the hourly mean, "z" is inserted with an appropriate sign to indicate whether the gradient was on the whole positive or negative, or too oscillatory to admit of the dominant sign being determined.

The factor for reduction to the open is usually determined month by month, from a comparison of the absolute values obtained from a standardised electrometer over a flat area with the corresponding readings from the electrograms.

The electric character of the day is indicated by the figures 0, 1, or 2 according to the character of the trace of the electrograph as regards negative potential gradient: thus 0 means no negative potential; 1, one or more excursions of limited duration to the negative side of the scale; 2, negative potential extending in the aggregate over at least three hours.

The charges on the ions, positive and negative, are determined by measurements with Ebert's Aspiration Apparatus, extending over fully half an hour between 14 h. and 16 h. The charge per cc. is multiplied by 10^{16} and given in coulombs* to facilitate comparison with the data in neighbouring columns.

In addition to all the ions with mobilities of the order of 1 cm. per second, the Ebert apparatus captures, it is believed, a very appreciable number of the slow-moving or Langevin ions. If all the Langevin ions were captured the figures given in the Table would probably, in most cases, be largely increased.

The figures published for the year 1919 are unfortunately subject to certain errors which are discussed in the Memorandum printed in the Annual Supplement (p. 111).

The Ebert apparatus is designed to determine not merely the number but also the mobility of the more mobile ions; the results of such determinations were given in the years 1911–1912 together with the deduced values of the conductivity and of the air-earth current. The figures were found, however, to present many inconsistencies, and the mobilities are no longer observed. The data now published for the air-earth current are derived from observations made with the apparatus designed

* In earlier volumes other units were used for the ionic charges.

In 1911 the number of ions was given. In computing the number the value 3.4×10^{-10} C.G.S. electrostatic unit or 11×10^{-20} coulomb was accepted as the charge upon an ion. Recent research has shown that this value was too low. Millikan's experiments (*Phil. Mag.*, Series 6, vol. xxxiv., 1917, p. 3) give 4.77×10^{-10} C.G.S. electrostatic unit, or 15.9×10^{-20} coulomb, for the ionic charge.

To reduce the 1911 entries to the form adopted in the current tables they must be multiplied by 11×10^{-4} .

For the years 1912–1915 the charge per cc. $\times 10^{20}$ is given in terms of the C.G.S. electromagnetic unit, which is equal to 10 coulombs. To reduce the entries for these four years to the present form, which was adopted for the year 1916, they must be divided by 1000.

To derive the number of ions per cc. from the entries in the present volume they must, if Millikan's results be accepted, be multiplied by 629. To derive the charge in C.G.S. electrostatic units per cubic metre multiply by 0.3.

by Mr. C. T. R. Wilson, combined with readings from the electrograms. Observations taken with the Wilson apparatus near 15 h. supply a value for the electrical conductivity, and this is combined with the mean value of the potential gradient in the open for the sixty minutes centering at 15 h., as derived from the electrograms. The observations are taken in a uniform way, and should be strictly comparable amongst themselves, but it is believed that multiplication by a factor exceeding unity would be required to give the true air-earth current.

6. Geophysics:—Eskdalemuir. This table contains magnetic and electrical data of the same general character as those for Richmond in Table 5, but with modifications. The Eskdalemuir magnetographs record the three rectangular components North, West, and Vertical. The extreme daily values, and their hours of occurrence, are given for each. In view of the uniformity of the temperature to which the magnetograph is exposed, no temperature correction has been applied.

In the electrical character statistics, 0, 1, and 2 have the same significance as at Richmond, but letters *a*, *b*, *c* are attached according to the range of oscillation of the potential gradient: *a* means that for no hour of the day was there a range as large as 1000 volts; *b* that a range of 1000 volts or more was reached in one hour at least, but in fewer than six hours; *c* that a range of 1000 volts or more was reached in at least six hours. These specifications must not be regarded as absolutely rigid criteria. After longer experience more definite specifications may be found possible.

7. Meteorology:—Jersey (St. Louis Observatory). Readings of pressure, temperature, humidity, wind direction and force, and amount of cloud, with type and direction, are given for 9 h., 14 h., and 21 h., together with the minimum temperature on grass, rainfall, and the duration of appreciable actinic strength of the sun's rays as registered by a Jordan recorder.* Remarks on the weather are also given. The first hour of observation was changed from 7 h. to 9 h. on 1st January 1919. The normals for the various elements are for different periods all ending in 1919. The number of years utilised in each case is given in the footnote.†

The observations for the years 1914, 1915, and 1916 were published as a special supplement to the Geophysical Journal, 1916.

8. Wind Components for four principal anemograph stations of the Meteorological Office, representing different parts of the country. As in Table 2, the wind velocities are expressed in metres per second, and represent mean values for the sixty minutes centering at the specified hours 3 h., 9 h., 15 h., and 21 h. The data at these four hours are not the resultant wind velocities, but their rectangular components in the North-South and East-West directions. North and South winds are treated separately, and so are East and West. The anemographs at Holyhead and Deerness are of the Robinson type, and of the same large size as those at Valencia and Kew Observatories, the arms being 610 mm., the diameter of the cups 230 mm., and the factor used for deriving the run of the wind from the run of the cups 2·2. The Scilly instrument is smaller, the arms being 305 mm., the diameter of the cups 127 mm., and the factor 2·8.

Recent investigations have shown that the correct factor depends on the speed. But it is not proposed to depart from the use of the constant factors until the

* Allowances based on personal observations are made for the times near sunrise and sunset when the sun is shining, but the light is not strong enough to give a trace. This is an important departure from the M.O. practice.

† Pressure, Air Temperature, and Rainfall, 26; Cloud Amount, 25; Humidity, 24; Grass Minimum, 23; Sunshine, 22; Wind, 16.

corrections have been determined with greater certainty.* The rule is that when the tabulated wind-speed is less than 1·6 m/s, components are not shewn, and the word "calm" is printed.

At Holyhead and Scilly there are also Dines pressure-tube anemographs, and the entries given under the heading "Maximum in a Gust" represent the highest speeds recorded by these instruments in the course of the day. The time of occurrence of the highest gust is also given. At Deerness, where there is only a Robinson cup anemograph, particulars are given as to the largest of the twenty-four mean hourly velocities, and the hour or hours of its occurrence. For Shoeburyness the hourly wind components as well as the gusts are derived from Dines records. Shoeburyness appears in the tables for 1919 in place of Yarmouth, the records for that station being incomplete.

9. **The Seismological Diary** consists in the main of results given by the **Galitzine Seismographs** † (two horizontal components and the vertical component) at **Eskdalemuir**, but includes data from a **Milne Seismograph** at **Richmond (Kew Observatory)**. The Eskdalemuir data include (i.) particulars of the earthquakes recorded, and (ii.) the amplitude and period of the microseisms shown by the North component Galitzine instrument on each day at 0 h., 6 h., 12 h., and 18 h. Disturbances attributed directly to wind or other purely local circumstance are excluded. The notation employed is as follows :—

P is the time of arrival of the first phase (longitudinal waves). S is the time of arrival of the second phase (transverse waves). L is the time of arrival of the long waves (surface waves).

$PR_1, PR_2 \dots$ are longitudinal waves reflected once, twice . . . at the earth's surface, prior to their arrival at the station. $SR_1, SR_2 \dots$ similarly denote reflected transverse waves. Any times given for reflected waves refer to the beginning of the disturbance at the observatory.

$M_1, M_2 \dots$ are the times of successive maxima of the displacement of the ground, corrected, if necessary, for the lag of the instrument.

iP means a sudden commencement of the P phase. e means an indistinct commencement of a phase. F is the end.

T, the period in seconds, is the duration of a double oscillation (to-and-fro movement). μ represents a micron (0·001 mm.).

Δ is the distance in kilometres of the epicentre measured along the arc of the great circle passing through the station. a the azimuth of the epicentre (0° to 360°) measured from North through East. The distance is estimated from Klotz's Seismological Tables (*Publication of the Dominion Observatory, Ottawa*, vol. iii. No. 2), which are also used for computing the time at which the disturbance originated. The time of origination is denoted by the letter O and inserted in italics.

A_n, A_e and A_z are the amplitudes of the components of the true displacement of the ground from the position of rest, and are measured in microns. When the displacement shown by the North-South seismograph is to the North a + sign is shown; for a displacement to the South a - sign is used. Similarly + is used for displacements to the East and upwards, - for displacements to the West and downwards. When the oscillations are of a simple harmonic character no sign is prefixed to the amplitude.

All the microseisms recorded are believed to arise from other than local causes. Microseisms are practically always in evidence, and their period usually remains at least approximately constant during a good many minutes.

The group of waves of greatest amplitude occurring in the 30 minutes centering at the hour in question is selected, and the amplitude tabulated is the mean obtained from two or three waves in that group.

The period is derived from a measurement made on the same group.

The data given for Richmond include the times of commencement of the disturbance and the time of the largest displacement shown on the trace. Additional information is given under the heading "Remarks." The boom of the instrument is oriented North-South, and moves when the ground is tilted East

* Cf. Notes on the Robinson Anemometer, F. J. W. Whipple. *Advisory Committee for Aeronaitics Reports and Memoranda*, No. 669, 1920.

† Vide *Geophysical Journal*, Annual Supplement, 1913; or G. W. Walker's *Modern Seismology*.

to West. It has, however, to be remembered that in reality the boom responds to ground movements of various kinds, and that the amplitude of the movement shown on the trace depends to a considerable extent on whether the oscillatory movement in the ground has a period near to or remote from the natural period of the boom. At the same time, a really large movement on the trace invariably means a large earthquake. Amplitudes, all measured on the trace in mm., are not recorded unless at least 1·0 mm. Those less than 0·2 mm. are characterised as very small, those between 0·2 and 0·5 mm. as small. During the year 1918 the period of the boom was approximately 18 seconds, and a movement of 1 mm. on the trace was produced by a tilting of from 0°·40 to 0°·50.

10. Soundings with Pilot Balloons. This table gives the results of **exploration of the free atmosphere** by means of pilot balloons. The soundings available are numerous; only those at Aberdeen, Eskdalemuir, Cahirciveen, South Farnborough, and Falmouth are included in this table.

The times refer to the beginning of the sounding; they are given to the nearest five minutes. Wind directions are given in degrees from True North (through East).

The wind velocity is derived from that of the balloon itself. This may be observed with two theodolites at the ends of a known base, or with one theodolite. As a rule, only one theodolite is employed, and the velocities are then deduced in the way explained in the Computer's Handbook, Section II.

The vertical velocities are calculated from the formula

$$V = 84 L^{\frac{1}{3}} / (W + L)^{\frac{1}{3}},$$

in which

L is the free lift of the balloon, i.e. the weight in grammes which the balloon can carry without rising,

W is the weight of the balloon in grammes, and

V is the vertical velocity in metres per minute.

The value 84 was adopted for the constant of this formula in place of 81 as from 1st September 1918. (M.O. Circular No. 27.)

The "Geostrophic Velocity" shown for each ascent is determined from the prevailing pressure gradient by the formula $v = \gamma / 2\rho\omega \sin \lambda$, in which γ is the horizontal pressure-gradient, ω the angular velocity of the earth, ρ the density of the air, λ the latitude, and v the required geostrophic velocity. The significance of geostrophic velocity is explained in the introduction to the Geophysical Journal for 1915. Reference may also be made to the Meteorological Glossary and to the Computer's Handbook, Section II. iii. The relation between actual winds and geostrophic winds has been discussed with reference to observations by J. S. Dines,* J. Fairgrieve,† and G. Dobson,‡ and from a theoretical standpoint by G. I. Taylor. §

The pressure gradient is derived from the charts of the Daily Weather Report International Section. If the hour of an ascent differs decidedly from a chart hour, results are usually calculated from each of the two charts which come nearest in time.

In the deduction of wind components, etc., the calculations are all carried out to 0·1 m/s (metre per second), but this degree of accuracy does not appear in the printed results except in the case of observed wind velocities under 5 m/s. Observed wind velocities of 5 m/s and over are given only to the nearest 0·5 m/s. Geostrophic or gradient wind velocities are given only to the nearest 1 m/s. Directions are given to

* "Advisory Committee for Aeronautics," *Fourth Report on Wind Structure*, 1914, p. 19.

† *Geophysical Memoir*, No. 9, 1914.

‡ *Q.J. Royal Met. Soc.*, 1914, p. 123.

§ *Phil. Trans. Roy. Soc.*, A, 1915, p. 1 *Proc. Roy. Soc.*, 1916, p. 196.

the nearest 5° in the case of observed wind velocities, but only to the nearest 10° in the case of geostrophic or gradient wind velocities.

Details of seven soundings by registering balloons are given in the Annual Supplement, together with certain aeroplane observations.

11. Nephoscope Observations. This table gives the results of observations of **Cloud Motion** at Aberdeen taken with Fineman's nephoscope.

The nomenclature used for clouds is in accordance with the specifications given in "The International Cloud Atlas" and in the "Observer's Handbook." Information as to the usual heights of the several forms is given in the following table:—

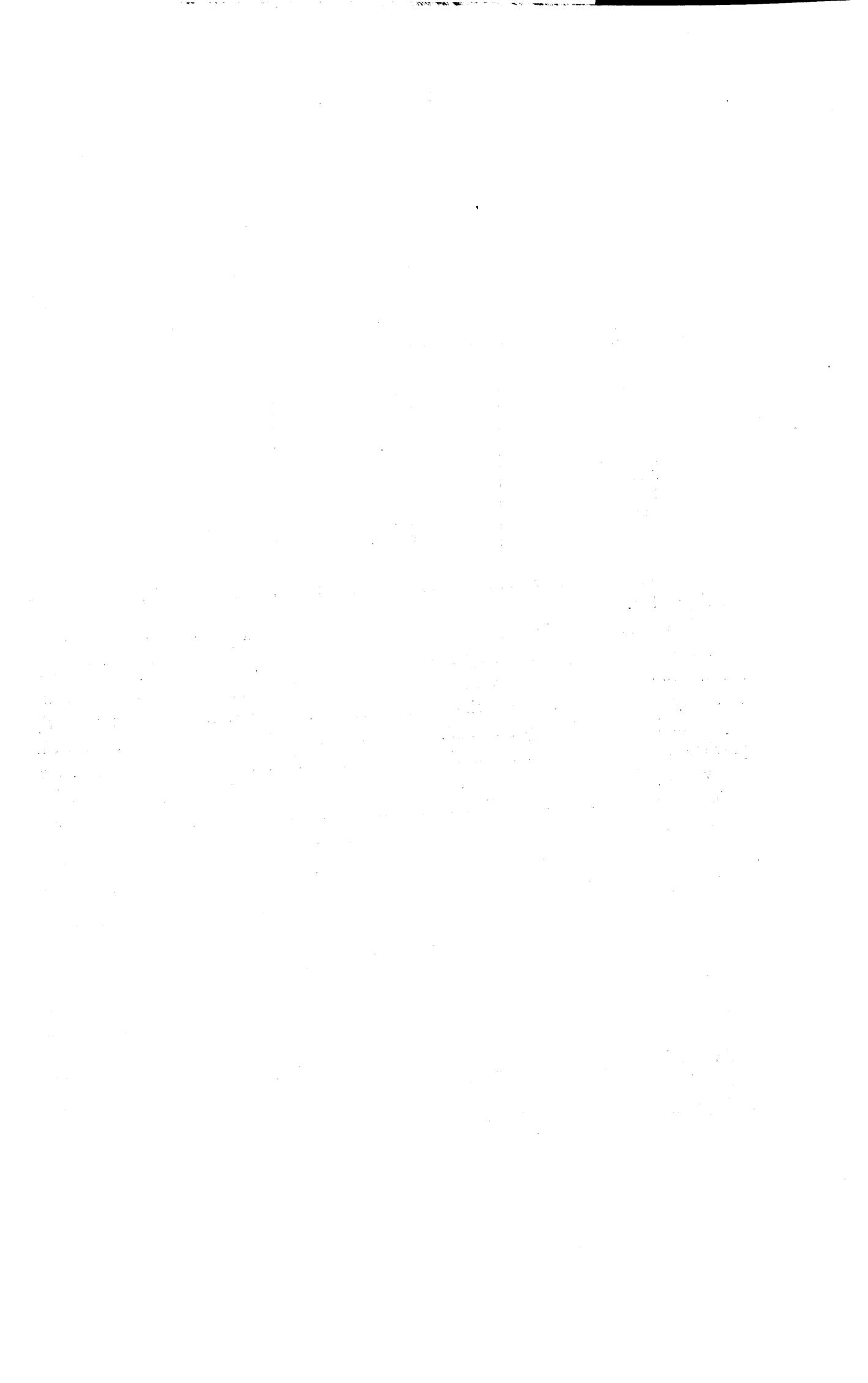
Form.	Abbreviation.	Height of base (metres).
Cirrus	Ci.	Mean 9000
Cirro-stratus	Ci-St.	"
Cirro-cumulus	Ci-Cu.	3000 to 7000
Alto-stratus	A-St.	"
Alto-cumulus	A-Cu.	"
Strato-cumulus	St-Cu.	Below 2000
Nimbus	Nb.	"
Cumulus	Cu.	Mean 1400
Cumulo-nimbus	Cu-Nb.	"
Stratus	St.	Below 1000

The following abbreviations are also used: cuf. = cumuliformis, lent. = lenticularis, and fr. = fracto.

The observations give what is termed for brevity the "velocity-height-ratio," *i.e.* the true cloud velocity divided by the height of the cloud. The velocity-height-ratio is equal to the instantaneous value of the angular velocity of the cloud about a point vertically beneath it, and on the same level as the observer. It is conveniently expressed in milliradians per second. For comparison with the nomenclature used in previous volumes it may be noted that for a low cloud at the height of one kilometre the velocity in metres per second is the same as the velocity-height-ratio in milliradians per second. A short discussion of the results for the five years 1912 to 1916 will be found in the Supplement to the 1916 volume.

12. Aurora. This table, introduced in January 1917, gives Aurora observations at various stations, and also shows the phases of the Moon and the "magnetic character" assigned for Richmond and Eskdalemuir. As "magnetic character" refers to a period of 24 hours beginning at midnight, it is convenient to show the characters for the two calendar days which include the night of the Aurora observations.

An **Annual Supplement** gives a summary of the Observations of the Temperature of the Upper Air made at Benson, Oxon, and at South Farnborough, as well as some electrical and magnetic data from Richmond (Kew Observatory) and Eskdalemuir. A discussion of the constants of the seismological instruments at Eskdalemuir is also included, together with a diagram showing the variation in the level of the underground water at Richmond.



METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.

Ninth Year.—No. 1. JANUARY 1919.]

Units based on the C.G.S. System.

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1. SUNSHINE AND SOLAR RADIATION.

Day.	WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.				RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.				ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.				CAHIRCIVEEN.								
	Bright Sunshine.*		Radiation received on Horizontal Surface by Calendar Radiograph.				Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.			Bright Sunshine.*		Radiation by Ångström Pyrheliometer.			Bright Sunshine.*						
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.		For Day.	Amount.	Time.	11.30 h. to 12.30 h.	Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	$\frac{p}{P}$ sec Z.	Intensity.	Total.	Per cent. of Possible.
I	0.0	0	90	13	6	13	42	5			0.0	0	...			hr.	%	h. m.				hr.	%
2	3.4	43	242	36	19	13	40	13	4.7	59	23	6	Ci			0.0	0	...	...	...	...	1.3	17
3	2.9	37	278	41	22	11	50	22	3.1	39	...	...	...	...	...	0.0	0	...	...	...	...	1.7	22
4	1.3	16	160	23	17	11	25	15	2.1	27	...	...	...	...	...	0.0	0	...	...	...	...	4.7	59
5	0.0	0	111	16	12	11	50	12	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	3.0	38
6	1.3	16	230	33	x 27	12	25	27	2.3	29	...	...	...	...	...	3.3	45	12 19	Hazy	4.53	54	0.0	0
7	0.0	0	151	21	22	13	35	17	0.2	3	...	...	...	...	...	0.0	0	...	...	...	...	0.7	9
8	0.6	8	111	15	22	12	40	12	0.4	5	...	...	...	...	...	4.0	55	12 26	Hazy	4.52	49	0.4	5
9	2.9	36	231	32	26	11	45	x 26	2.4	30	...	...	...	...	...	0.0	0	...	...	...	...	0.0	0
10	1.1	14	212	29	17	12	50	9	2.1	26	38	II	Ci			1.7	23	...	...	...	...	0.3	4
11	0.7	9	185	25	x 27	10	50	18	1.5	19	...	...	...	...	...	0.2	3	...	...	...	...	2.8	35
12	0.2	2	163	22	15	10	20	12	0.2	2	...	...	...	...	...	0.0	0	...	...	...	...	0.1	1
13	0.0	0	0	0	0	—	0	0	0.0	0	...	...	...	...	...	4.5	60	12 21	Ci	4.33	61	0.0	0
14	0.0	0	70	9	9	II	40	9	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	1.6	19
15	0.2	2	170	22	18	13	45	12	0.0	0	...	...	...	...	...	2.3	30	...	...	...	...	2.9	35
16	x 3.6	43	x 282	35	x 27	11	20	20	3.2	39	47	14	Clear	0.3	4	...	...	...	...	...	...	1.8	22
17	2.9	35	231	29	22	12	50	17	x 5.1	61	53	16	Clear	1.6	21	...	...	...	...	...	...	3.5	42
18	1.0	12	181	22	19	11	50	19	2.3	27	...	...	...	...	...	x 6.7	86	12 20	Clear	4.09	70	0.4	5
19	0.0	0	131	16	14	13	25	9	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	4.4	52
20	0.0	0	61	7	5	14	25	3	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	4.4	52
21	0.0	0	126	15	13	II	45	13	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	0.0	0
22	0.1	1	149	17	15	13	20	12	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	0.2	2
23	0.0	0	129	14	12	12	25	12	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	0.0	0
24	0.0	0	115	13	14	II	15	10	0.5	6	...	...	...	...	...	0.0	0	...	...	...	...	0.0	0
25	0.0	0	201	22	17	12	47	14	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	4.1	48
26	0.0	0	95	10	7	12	30	7	0.0	0	...	...	...	...	...	3.2	39	...	...	...	...	1.2	14
27	0.5	6	224	23	26	12	25	x 26	0.7	8	...	...	...	...	...	3.6	43	...	...	...	...	3.5	40
28	0.0	0	183	19	14	12	0	14	0.0	0	...	...	...	...	...	0.3	4	...	...	...	...	6.2	70
29	0.0	0	143	14	II	II	36	II	0.1	1	...	...	...	...	...	3.1	37	...	...	...	...	x 7.2	81
30	0.0	0	0	0	0	—	0	0	0.0	0	...	...	...	...	...	1.1	13	...	...	...	...	1.5	17
31	0.0	0	0	0	0	—	0	0	0.0	0	...	...	...	...	...	0.0	0	...	...	...	...	6.2	69
Means	0.74	9	150	18	15	—	—	1.3	1.00	12	—	—	—	—	—	1.16	15	—	—	—	—	2.10	26
Normal	0.68	8	161	—	—	—	—	—	1.39	17	—	—	—	—	—	0.94	12	—	—	—	—	1.55	19
	← 35 years →		7 years		← 35 years →				← 35 years →				← 35 years →				← 35 years →				← 35 years →		

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9.1 m. H_b = 13.7 m. H_a = 26.4 m. Above Ground: h_t = 1.3 m. h_r = 0.56 m. h_a = 13.9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0–10) and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.		Magnetism.			
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	m/s.	m/s.	Sky covered.	mm.	200+	76	• n. and a. Fair p.	Horizontal Force, Declination West, and Inclination.				
	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	mm.	14.2	77	Fair n. and a. • ² to fair p.	19° 33' 8'				
1	mb.	mb.	200+	200+	200+	200+	millibar.	%	%	%	100●	2	200+	76	• n. and a. Fair p.	19° 33' 8'				
2	1002.8	999.1	83.1	80.0	x 84	79	12.2	8.5	99	85	200	4	255	17	11.4	77	Fair n. and a. • ² to fair p.	19° 33' 8'		
3	1002.1	993.4	80.1	79.1	81	77	8.2	8.2	81	87	245	10	245	13	7	5	Fine generally. ▲ <u>W</u> p.	19° 33' 8'		
4	993.9	986.3	78.2	76.4	79	75	6.7	6.4	76	83	260	11	—	1	3	5	1.5	75	19° 33' 8'	
5	987.9	979.9	75.3	77.6	78	n ₇₂	6.7	6.8	76	81	15	2	5	6	4	0.7	73	Fine — n. ▲ a. Fine, with p. p.	19° 33' 8'	
6	976.8	956.8	77.6	79.3	80	74	7.4	8.6	87	90	150	5	350	4	100●	10●	Fine n. • a. • ² later.	19° 33' 8'		
7	958.2	978.6	78.9	79.4	81	78	8.7	8.8	94	92	230	5	350	2	100●	3	• n. and a. Fair p. <u>W</u> p.	19° 33' 8'		
8	958.9	968.6	78.7	80.8	81	79	8.2	9.4	90	89	260	2	135	6	4	7	Fair, with p. n. and a. o. p. <u>W</u> p.	19° 33' 8'		
9	980.0	994.1	79.3	78.1	81	77	8.5	7.7	89	87	275	3	245	13	100●	7	o. p. n. • a. p. <u>W</u> p.	19° 33' 8'		
10	991.8	998.1	76.7	78.0	79	76	7.1	7.5	89	86	175	6	265	10	10	8	o. p. n. • a. p. <u>W</u> p.	19° 33' 8'		
11	998.7	1001.6	79.2	78.3	82	77	9.0	8.4	96	94	250	3	—	0	8	7	6.3	74	p. n. and a.	19° 33' 8'
12	1000.2	1004.8	79.0	80.0	81	76	8.7	7.6	94	76	160	4	315	5	8	5	9.6	75	c. n. p. to • ² a. p. to fine p.	19° 33' 8'
13	1004.5	996.4	79.6	84.2	x 84	75	8.4	13.1	86	99	160	7	180	9</						

3. METEOROLOGY:—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28' N.$ Long. $0^{\circ} 19' W.$ Heights above Mean Sea Level:—Rain-gauge Site, H = 5.5 m. Barometer, H_b = 10.4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.				Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.			
							Vapour Pressure.	Percentage.												
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.						
1	mb.	mb.	200+	200+	200+	200+	millibar.	%	%	m/s.	m/s.	100+	10	200+	6.9	68	Dull. • p. and n.			
2	1016.1	998.4	75.2	80.0	81	73	6.9	9.6	97	96	225	2	214	10	6.9	68	Fine. • n.			
3	1000.1	1001.8	78.3	77.2	81	77	7.2	7.1	81	87	236	8	225	2	2.7	75	• early and n. Fine to dull.			
4	998.3	983.9	77.4	79.0	81	77	7.4	8.6	89	92	236	4	113	5	1.1	73	• early. Dull to fine. • p.			
5	979.6	973.5	75.5	77.6	79	75	6.6	7.8	90	92	248	4	90	4	8.2	73	Fair to dull.			
6	972.1	977.9	77.1	76.8	78	76	7.5	6.6	92	83	45	3	304	3	—	74	—			
7	982.6	979.1	75.8	78.1	79	74	6.8	7.4	91	84	236	2	158	5	10.0	69	Dull to fine. □			
8	973.8	985.3	78.1	79.0	81	78	7.9	8.3	90	89	169	6	180	4	1.2	73	• a. Dull to fine.			
9	991.0	995.0	78.9	79.7	82	78	8.1	8.7	87	89	158	5	203	5	—	73	Dull to fine.			
10	991.4	1000.4	80.3	78.9	82	78	7.9	7.0	77	75	214	8	214	7	7	76	Fair to fine. ▲ showers.			
11	1005.6	1006.5	77.0	77.1	79	76	7.1	7.2	88	88	191	3	203	7	10.0	9.8	• early and n. Fine to fair.			
12	1006.1	1005.1	75.3	72.3	79	72	6.9	5.4	95	94	—	1	—	1	10.0	8.4	• early. Dull to fine. $\equiv^2 n$.			
13	1003.4	1004.6	77.5	75.5	80	72	7.9	7.1	94	96	203	4	—	1	10.0	9.9	Showers early. Dull to fair. \equiv			
14	1010.0	1014.8	74.6	75.2	76	73	6.8	7.1	100	99	—	1	—	1	10.0	9.2	□. \equiv^2 all day.			
15	1011.8	1006.3	80.8	83.4	84	76	9.8	12.0	93	96	191	5	214	8	10.0	5.3	Dull. Showers.			
16	1007.5	1000.7	83.5	82.2	x 85	80	11.7	10.3	93	89	225	4	248	6	10.0	5.8	Dull to fair. • p.			
17	1006.2	1003.3	80.5	77.4	82	77	8.4	7.1	81	85	214	7	248	5	9	0.7	Fine to fair. Showers.			
18	1009.8	1011.9	75.9	75.6	80	74	6.4	6.4	85	87	270	3	270	2	0.2	73	Fine to fair. Shower 16 h.			
19	1016.3	1020.7	73.4	73.9	79	72	5.9	6.2	93	94	270	2	—	1	0.5	68	□. Fine to o. □. $\equiv^0 n$.			
20	1021.4	1018.9	71.3	76.3	77	70	5.4	7.0	100	90	—	0	214	2	10.0	0.1	□. o., with \equiv a. $\equiv^0 p$.			
21	1013.0	1010.4	77.9	77.8	79	77	7.9	7.5	92	88	146	4	169	7	10.0	5.2	Dull and wet.			
22	1014.4	1017.3	77.3	75.4	78	75	7.2	6.9	87	95	158	3	113	3	10.0	6.1	Dull and wet.			
23	1023.7	1030.6	75.8	74.3	77	73	6.0	5.1	81	77	90	3	68	2	0.2	71	• early. □. Dull to c.			
24	1034.0	1035.4	71.0	74.9	76	70	4.5	6.0	86	85	—	0	45	2	8.0	0.2	□. \equiv^0 g. h. o. to fine.			
25	1038.3	1036.5	73.6	74.4	76	73	5.6	5.4	88	80	—	0	—	1	8.0	n 66	□. o. to cloudy a. o. p.			
26	1033.9	1025.3	71.9	74.6	76	70	5.2	6.2	91	91	225	2	6.0	10.0	0.4	n 66	□. Fine to o. \times^0 at times p. • n.			
27	1015.2	1009.2	74.7	73.9	77	72	6.9	6.3	100	96	—	1	293	2	10.0	1.9	\equiv to o. • early and p. □ n.			
28	1005.9	999.3	73.4	73.7	77	70	5.7	6.1	91	94	293	2	338	4	10.0	n 66	~. □. Dull to fine. Showers \times^0 .			
29	1008.1	1016.0	74.1	74.6	75	74	6.3	5.8	95	86	23	3	23	2	10.0	73	* early. \times . Dull. \equiv^0 .			
30	1017.6	1016.8	74.2	75.2	76	73	6.1	7.1	91	99	11	4	11	3	6.0	0.5	o. to cloudy. • p.			
31	1020.0	1021.8	73.0	71.4	76	71	4.8	3.2	79	n 59	56	4	45	5	10.0	72	Dull. \times^0 showers p.			
Means	1008.0	1007.4	75.9	76.4	78.7	74.1	6.9	7.0	89	88	3.3	3.7	8.2	7.3	89.7	71.5	Monthly Totals or Means.			
Normal	1016.4	1016.2	76.3	76.8	79.2	74.5	6.8	7.0	86	85	3.5	3.6	—	—	46.7	—	Normals.			

4. METEOROLOGY:—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19' N.$ Long. $3^{\circ} 12' W.$ Heights above Mean Sea Level:—Rain-gauge Site, H = 242 m. Barometer, H_b = 237.3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Vane of Anemometer, h_a = 15 m.

Day.	REMARKS.																	
	9 h.		12 h.		15 h.		18 h.		21 h.		24 h.		27 h.		30 h.			
	Temp.	Wind	Temp.	Wind	Temp.	Wind	Temp.	Wind	Temp.	Wind	Temp.	Wind	Temp.	Wind	Temp.	Wind		
1	975.0	953.8	74.4	77.1	79	67	6.4	6.9	95	84	200	13	220	17	10.0	24.9	64	$\times^2 p.$ \boxtimes 1 cm. $\bullet^2 \equiv^2$ till 21 h.
2	957.6	966.5	77.4	74.5	78	73	7.1	6.2	85	91	290	12	160	3	10.0	14.3	73	\bullet^2 till 7 h. 30 m. o. d. a. Fine after 16 h.
3	903.1	958.3	70.8	69.3	74	69	5.0	4.3	97	93	—	—	10.0	—	—	69	V \equiv^0 to o. a. \times^0 13 h.	
4	951.7	948.4	73.0	74.8	75	71	5.3	5.9	87	86	20	3	360	7	10.0	1.6	65	\boxtimes o. a. $\bullet^2 \equiv^0 \times^0 p.$ d. n.
5	949.6	951.3	75.7	75.9	76	74	6.5	6.8	88	90	10	7	360	5	10.0	0.7	73	$\bullet^2 \times^0$ 7 h. p. to o. a. o. d. n.
6	948.8	948.8	74.9	71.3	76	71	5.8	4.6	82	86	—	0	—	0	6	3.2	72	Fair to fine. □ n.
7	949.4	955.3	76.1	76.6	77	71	6.6	6.6	86	86	120	10	120	4	10.0	2.8	67	□ early. \bullet 5 h. o. to $\bullet^2 p.$
8	963.7	961.5	72.8	75.7	78	72	5.4	6.8	90	91	—	0	130	5	10.0	—	71	Cloudless a. Dull p. and n. \equiv^0 19 h.
9	948.8	950.3	78.0	78.0	79	x 76	7.5	8.1	86	93	130	12	220	13	10.0	11.2	73	• 3 h.-4 h. \bullet o. and n. $\equiv^0 p.$
10	968.1	970.9	76.0	73.8	78	73	6.5	5.7	86	88	210	8	160	5	10.0	6.2	75	$\times^0 \bullet^0$ a. $\times^2 \bullet^0$ p. \boxtimes fair n.
11	972.8	972.7	73.9	74.2	76	74	6.3	6.3	96	95	180	2	160	5	10.0	1.5	70	\boxtimes o. d. \equiv^0 a. Fair p. $\equiv^0 \times^0 \bullet^0 n.$
12	972.3	975.3	74.0	75.1	76	73	6.5	7.1	100	99	—	0	10.0	—	10.0	1.7	72	$\times^0 \bullet^0$ till 4 h., then \equiv . Dull. \equiv^0 p. and n.
13	981.9	978.4	69.2	75.2	76	69	4.4	6.8	95	95	—	0	160	6	9.0	1.4	66	b. \equiv^0 7 h. Fine a. \oplus p. \boxplus^0 . \bullet n.
14	973.9	975.4	77.9	76.1	x 80	x 76	7.9	7.6	92	99	220	3	—	0	8	16.0	73	$\bullet^2 \equiv^0$ 4 h. d. to \equiv^0 later.
15	971.2	968.2	79.1	75.6	x 80	74	8.7	6.1	92	84	210	7	250	4	10.0	6.8	74	$\bullet^2 6$ h.-7 h. Fine a. \bullet^2 to o. \boxplus^2 22 h.
16	965.8	967.4	75.8	76.0	77	74	6.8	6.5	91	86	210	8	280	9	10.0	4.7	73	$\times^0 \bullet^0$ q. a. and p. q. n. p. 24 h.
17	975.4	981.4																

5. GEOPHYSICS:—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.								Air-Earth Current. $\times 10^{16}$.		Potential Gradient, Volts per metre. Factor 2·16.				
					Horizontal Comp't		Declination.		Inclination.		Magnetic Character of Day.	Electric Character of Day.	Charge per cc. $\times 10^{16}$. + -		3 h.	9 h.	15 h.	21 h.	
	0·3 m.	1·2 m.	Daily Mean.	Extremes.	Mean Time.		Mean Time.	West.	Mean Time.	North.			About 15 h.	About 15 h.					
	a.	a.											coulomb.	amp/cm ² .	v/m.	v/m.	v/m.	v/m.	
1	200+	200+	cm.	cm.	h m	γ	h m	.	h m	.	o	2	...	...	475	635	-410	80
2	78·1	80·8	262	261	11 17	18414	14 24	14 46·6	14 28	66 56·4	o	1	...	...	105	240	360	665
3	78·2	80·9	264	...	...	...	...	...	...	...	2	2	0·22	0·22	55	515	700	-200
4	78·0	80·7	264	...	...	...	...	...	...	...	2	2	...	...	120	425	700	-280
5	78·0	80·7	270	...	...	...	...	...	...	...	1	1	...	...	400	425	320	160
6	77·9	80·6	277	...	...	...	...	...	...	...	2	1	...	...	410	465	405	330
7	77·6	80·3	284	...	...	...	...	...	...	...	1	2	0·32	0·22	0·65	105	-490	280
8	77·6	80·3	291	o	1	0·41	0·17	0·75	320	330	210	465
9	78·0	80·4	295	...	11 18	18400	14 25	14 46·6	14 19	66 58·9	o	1	0·30	0·15	0·45	65	280	z±	435
10	77·9	80·2	300	o	2	0·30	0·02	0·70	265	425	595	z±
11	77·4	80·2	304	...	...	...	...	...	...	...	o	1	...	...	170	900	770	650
12	76·7	80·2	311	...	...	...	...	...	...	...	o	1	...	...	625	-210	545	795
13	76·7	80·0	316	...	...	...	...	...	...	...	1	o	...	...	1100	490	610	635
14	76·9	79·9	320	...	...	...	...	...	...	...	1	1	...	...	170	330	250	145
15	78·9	79·9	322	o	1	0·54	0·34	0·55	160	305	400	-105
16	79·0	79·9	323	...	11 22	18426	14 25	14 50·2	14 32	66 58·3	2	1	0·58	0·41	0·45	210	160	160	555
17	78·2	79·9	327	1	1	0·22	0·30	0·65	330	665	360	860
18	77·0	79·9	330	...	...	...	...	...	...	...	2	o	...	...	465	635	425	465
19	76·2	79·9	333	...	...	...	...	...	...	...	2	o	...	...	570	875	635	875
20	76·2	79·9	336	337	...	...	...	...	...	...	1	2	...	...	145	0	120	-65
21	76·8	79·9	334	...	...	...	...	...	...	...	1	2	...	...	265	290	-410	-120
22	76·8	79·9	332	...	11 16	18402	14 21	14 47·4	14 32	66 57·7	o	o	0·50	0·15	0·75	610	850	635	1100
23	75·9	79·7	332	o	o	0·30	0·43	0·90	980	...	980	715
24	75·3	79·5	332	o	o	0·34	0·09	0·70	625	675	360	665
25	75·0	79·3	331	...	...	...	...	...	...	...	o	1	...	...	820	635	330	-160
26	75·0	79·3	330	...	...	...	...	...	...	...	o	1	...	...	265	940	290	715
27	75·1	79·0	327	...	...	...	...	...	...	...	o	2	...	...	890	665	820	-320
28	75·0	79·0	322	...	...	...	...	...	...	...	1	1	...	...	55	120	835	890
29	75·0	78·9	320	...	11 24	18405	14 23	14 52·3	14 14	66 57·4	o	o	0·54	0·13	1·20	265	635	530	650
30	75·0	78·9	321	1	o	0·71	0·28	1·95	290	515	755	755
31	74·9	78·8	322	o	o	0·71	0·28	1·95	376*	452*	418*	398*
M.	76·8	79·9	311	—	—	—	—	—	—	—	—	—	—	—	—	376*	452*	418*	398*
	76·8	79·7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Mean of 28 days.

6. GEOPHYSICS:—ESKDALEMUIR.

Day.	Magnetic Force.								Potential Gradient, Volts per metre. Factor 6·02.									
	North Component.			West Component.			Vertical Component.		Magnetic Character of Day.	Electric Character of Day.	3 h.	9 h.	15 h.	21 h.				
	Maximum. 15000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	Maximum. 44000 γ +.	Minimum. 44000 γ +.	Range.	3 h.	9 h.	15 h.	v/m.	v/m.	v/m.			
1	h m	γ	h m	γ	h m	γ	h m	γ	h m	γ	o	2 c	200	-1805	-405	-30		
2	8 1	980	948	19 14	32	12 6	916	885	23 33	31	o o	1101	1089	11 10	12	65	170	
3	21 5	975	955	0 6	20	12 48	921	888	1 12	33	20 27	1270	1086	18 45	184	335	675	305
4	20 27	21145	864	20 40	281	18 48	942	746	20 4	196	19 20	1321	11001	23 27	320	455	275	150
5	19 22	1134	849	13 2	285	13 18	x 972	n 653	19 33	319	16 42	1194	1011	o 2	183	2	1 b	-355
6	19 43	1064	846	3 14	218	19 49	937	729	16 43	208	19 57	1111	1062	1 52	95	1	o a	210
7	15 17	1003	890	15 0	113	22 37	951	813	21 15	138	19 58	1114	1081	24 0	33	o	1 b	600
8	20 37	979	915	10 6	64	23 17	920	869	20 0	51	18 50	1106	1090	23 30	16	o	2 b	-155
9	21 58	997	894	13 47	103	13 18	924	877	24 0	47	19 55	1114	1061	5 58	53	1	1 b	355
10	6 36	977	939	11 34	38	14 20	915	870	21 44	45	17 39	1111	1079	6 25	32	1	2 b	-615
11	7 16	982	949	12 28	33	13 50	918	888	22 18	30	15 10	1100	1093	4 10	7	o	2 c	165
12	23 29	996	941	11 1	55	13 49	921	891	19 20	30	18 50	1106	1090	23 30	16	o	2 b	370
13	5 55	1026	906	8 12	120	18 18	953	873	21 37	80	19 55	1114	1061	5 58	53	1	1 b	290
14	0 58	1025	911	6 18	114	7 22	962	867	8 20	95	18 51	1110	1065	7 29	45	1	2 b	-1445
15	22 2	988	932	12 26	56	14 36	932	850	22 18	82	17 34	1122	1060	23 29	62	1	1 b	495
16	21 19	1011	940	2 45	71	13 37	953	728	21 40	225	19 21	1181	1067	24 0	114	2	2 c	150
17	19 30	1010	891	11 44	119	7 26	942	814	20 30	128	19 5	1141	1025	3 54	116	1	1 b	105
18	19 36	1049	867	17 14	182	13 26	937	746	17 27	191	17 25	1186	1063	o 11	123	2	1 a	235
19	20 54	1044	895	21 13	149	2 24	940	824	19 49	116	19 48	1142	1063	2 36	79	1	1 a	235
20	23 13	1009	929	16 30	80	15 49	937	850	23 17	69	22 53	1098	1081	o 0	17	o	2 b	210
21	21 52	1011	947	13 5	38	14 3	922	881	22 55	41	o o	1068	1092	13 30	10	1	2 c	-855
22	19 47	1006	956	12 59	30	14 3	914	884	9 19	30	23 10	1090	1082	13 0	8	o	2 a	275
23	22 5	994	937	18 16	57	15 34	940	836	20 50	104								

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$ Heights above M.S.L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1.48 m. h_r = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.						Min. Temp. on Grass.	Percentage of Humidity.				Rain 0 h. to 24 h.	REMARKS.
	9 h. [†]	14 h.	21 h.	Mean of 3 Readings.	9 h. [†]	14 h.	21 h.	Max.	Min.	Mean of 5 Readings.		9 h. [†]	14 h.	21 h.	Mean.		
1	mb.	mb.	mb.	mb.	a.	a.	a.	a.	a.	a.	200+	%	%	%	%	mm.	
2	1011.9	1007.3	999.1	1006.1	80°1	78°7	80°7	80°8	77°8	80°1	60°8	70	74	98	81	10°0	A.-Cu, red-yellow 8 h. ● ² began 12 h.
3	1003.7	1003.0	998.2	1001.6	82°1	82°1	81°5	82°6	x 81°3	81°9	76°7	63	71	87	74	2°5	Cloudless sky 4 h. ● 20 h.
4	996.1	988.7	978.5	987.8	81°2	81°3	80°8	82°6	79°1	81°0	77°5	94	86	88	89	11°6	● n. and at 17 h. and 22 h.
5	973.4	965.1	964.0	967.5	78°1	78°1	80°1	76°7	78°6	77°1	87	95	88	90	5°7	● from 10 h.	
6	965.4	968.2	975.5	969.7	79°5	81°1	79°0	81°3	78°4	79°9	77°1	90	76	85	84	7°4	● 8 h. 30 m.-16 h.
7	982.1	979.5	968.6	976.7	79°1	80°3	80°0	81°5	77°8	79°7	72°3	77	61	77	72	2°4	● 4 h. 30 m. ● 21 h. ↗.
8	966.6	972.6	979.1	972.8	80°0	81°8	80°1	82°0	77°9	80°4	75°9	78	75	80	78	2°2	● 9 h. 45 m.
9	986.9	990.6	991.0	989.5	82°0	82°6	81°2	83°3	79°4	81°7	76°4	73	79	90	81	5°0	● showers from 5 h. ● 20 h. 30 m.
10	991.4	995.4	1000.9	995.9	80°9	80°1	79°7	82°0	77°6	80°1	76°6	70	69	69	69	2°8	●▲ 12 h. 45 m. q. in afternoon.
11	1001.6	1001.8	1001.7	1001.7	78°9	80°6	78°8	81°0	77°4	79°3	75°5	80	73	78	78	2°0	
12	1001.9	1001.6	1000.8	1000.8	79°0	80°9	79°0	81°6	78°5	79°8	75°0	79	77	90	82	—	Frequent showers from 12 h.
13	1000.3	1000.1	1001.1	1000.5	79°2	80°6	82°1	82°1	76°8	80°4	72°3	90	86	90	89	2°1	● ² n. and a.
14	1000.3	1005.5	1009.0	1007.9	80°6	82°5	81°3	82°9	80°2	81°5	74°5	94	78	82	85	11°1	● ⁰ 6 h. ● 14 h.
15	1005.4	1002.7	1002.2	1003.4	83°5	83°1	80°3	x 84°1	80°2	82°2	82°3	96	93	96	95	6°3	Frequent ● ² showers.
16	1005.7	1002.9	1003.7	1004.1	81°1	82°3	80°6	83°0	78°5	81°1	76°2	83	80	72	78	7°2	↖ 6 h. 30 m. ● p. ▲ 15 h. 40 m.
17	1009.5	1009.5	1009.7	1009.6	80°2	79°8	79°7	82°8	77°4	80°0	73°1	69	78	74	74	4°5	● 12 h. ▲ 12 h. 30 m. and 16 h. 35 m.
18	1011.0	1013.8	1015.9	1013.6	78°8	80°9	78°6	81°1	77°3	79°3	69°7	73	60	70	68	—	[]
19	1015.3	1013.8	1012.5	1013.9	79°1	77°4	77°4	80°0	77°1	78°2	71°6	74	87	97	86	5°2	≡ 7 h. ● ⁰ 10 h. ● ² p.
20	1006.2	1003.1	1003.0	1004.1	79°7	79°0	77°3	79°8	76°4	78°4	76°8	97	90	88	92	13°0	Frequent ● ² showers.
21	1008.6	1009.7	1010.2	1009.5	79°5	82°3	79°8	82°7	76°4	80°1	72°4	94	60	94	83	10°0	● ² n. to 9 h. ● ² 14 h.
22	1012.2	1016.2	1022.0	1016.8	78°7	78°3	77°1	78°8	76°0	77°8	76°0	86	66	74	75	8°8	● ² n. to 5 h.
23	1026.1	1026.4	1027.5	1026.7	75°3	76°1	75°7	77°8	74°5	75°9	68°9	77	80	79	79	—	[]
24	1030.6	1029.4	1029.4	1029.8	74°1	76°4	75°7	77°0	73°3	75°3	69°2	69	62	65	65	—	
25	1026.5	1024.3	1022.1	1024.3	75°1	76°7	75°9	77°0	74°5	75°8	69°1	82	70	79	77	—	≡ ⁰ a.
26	1013.1	1009.0	1006.3	1009.5	80°1	80°0	77°7	80°9	75°0	78°7	74°1	92	89	82	88	2°6	● early. ≡ ⁰ a.
27	1004.2	999.3	999.9	1001.1	78°7	77°1	77°7	80°3	75°8	77°9	70°1	58	87	n 55	67	x 17°0	● ² n. ●▲ 10 h. ● ² 13 h. ▲ 15 h. T
28	1002.7	1003.8	1007.4	1004.6	77°4	77°1	76°0	77°7	75°9	76°8	73°0	62	70	79	70	3°6	None peal.
29	1010.6	1009.9	1009.9	1010.1	76°9	78°1	77°5	78°7	73°9	77°0	70°1	84	71	75	77	2°3	Frequent ● showers.
30	1011.3	1012.1	1013.4	1012.3	75°9	77°0	76°1	77°6	75°6	75°8	73°9	79	70	74	74	0°4	● ⁰ 4 h.
31	1013.9	1012.9	1012.7	1013.2	74°1	74°1	74°0	n 76°0	n 70°6	73°8	70°9	77	68	86	77	0°1	≡ ⁰ a. * ⁰ 9 h. 30 m. ● ⁰ 20 h.
Means	1003.6	1002.9	1002.6	1003.0	79°1	79°7	78°9	80°8	77°1	79°1	73°7	80	77	82	80	14°5	
Normal	1011.4	1011.3	1011.9	1011.5	78°5	79°8	78°9	80°6	77°2	79°0	73°9	84	77	82	81	67.7	
	← 26 years	→ 26 years			← 26 years	→ 26 years			← 23 years	→ 23 years	← 24 years	→ 24 years	← 26 years	→ 26 years			

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).				Mean.	Sunshine.*				Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.								
	Wind Direction and Force		Sunshine.			Upper.		Lower.		Upper.		Lower.		Upper.		Lower.		
	Total.	Percent. of Possible.	Tenths.	Type.		9 h. [†]	9 h. [†]	9 h. [†]	9 h. [†]	14 h.	14 h.	14 h.	14 h.	21 h.	21 h.	21 h.	21 h.	
1	225	2	225	5	225	7	4°7	0°0	0	10	...	...	...	Nb.	...	10	...	...
2	247	5	247	5	203	5	5°0	4°1	50	4	Ci.	...	...	W	...	10	...	...
3	225	4	180	5	247	4	3°8	4°5	8	Ci.	W	...	...	Ci.-Cu.	SW	8	...	...
4	135	3	113	3	180	3	3°0	0°3	4	10	...	...	...	SSE	10	...	...	...
5	203	2	—	0	360	3	1°7	1°2	15	8	...	...	...	Ci.	...	10	...	...
6	247	4	203	4	180	6	4°7	3°1	37	6	...	...	...	Cu.-Nb.	W	7	...	...
7	203	5	225	5	203	5	5°0	2°3	28	7	...	...	...	Cu.-Nb.	SSW	7	...	...
8	247	4	247	4	203	5	4°3	4°3	51	4	A.-Cu.	WSW	...	Cu.-Nb.	WSW	8	...	...
9	225	6	247	6	247	5	5°7	4°9	59	6	...	...	...	Cu.	SW	5	...	...
10	225	4	203	4	203	5	4°3	4°3	60	2	...	...	...	Cu.	SW	3	...	...
11	225	4	180	3	203	3	3°3	4°3	50	8	...	...	...	Cu., Cu.-Nb.	SSW	5	...	...
12	203	3	247	3	225	3	3°0	1°3	15	8	A.-Cu.	W	...	Cu.-Nb.	W	8	...	...
13	—	0	315	2	247	1	1°0	57	67	4	A.-Cu.	...	...	Cu.-Nb.	NW	10	...	...
14	180	4	203	4	225	5	4°3	4°3	58	3	A.-Cu.	...	...	Nb.	...	10	...	...
15	203	4	203	4	270	4	4°0	0°6	7	10	...	...	...	Nb.	SSW	9	...	...
16	225	6	225	3	270	4	4°3	4°4	52	3	...	...	...	Cu.	WSW	3	...	...
17	293	3	293	2	315	3	2°7	3°5	41	4	Ci.	...	...	Cu.-Nb.	WNW	5	...	...
18	45	2	360	2	315	2	2°0	7°4	86	4	Cu.	...	...	Ci.-Cu.	N	3	...	...
19	203	2	203	3	180	4	3°0	0°0	10	...	...	...	...	Nb.	S	10	...	...
20	180	5	180	4	180	4	4°3	1°7	19	7	...	...	...	Nb.	...	10	...	...
21	293	1	293	2	293	1	1°3	0°3	4	6	A.-Cu.	ENE	...	Cu.-Nb.	NNW	10	...	...
22	67	4	45	5	67	3	4°0	5°3	60	6	A.-Cu.	ENE	2	...	...	5	...	4°3
23	90	1	90	3	67	2	2°0	3°4										

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 8·8 m., Ground 13·7 m., M.S.L. 19·2 m.
Height of Cups above—Roof 4·6 m., Ground 7·6 m., M.S.L. 15·2 m.

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1·5 m., Ground 4·9 m., M.S.L. 57·3 m.

Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.	Day.	3 h.				9 h.				15 h.				21 h.				Vel. in Max. Hourly Run.	Time of Max.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.						
1	8·5	12·8	...	5·3	...	10·9	...	2·2	...	8·7	...	13·0	...	24·6	23	25	I	11·3	...	2·2	13·7	...	5·7	4·0	...	1·6	2·2	1·4	14·8	9		
2	7·9	...	19·1	16·1	...	2·0	...	10·0	...	0·8	...	1·8	...	30·8	2	15	2	...	4·4	...	4·4	9·2	...	8·5	3·5	...	1·8	0·8	9·5	II	10		
3	3·3	...	14·4	4·0	...	9·7	...	4·2	...	6·2	...	1·8	...	2·7	...	18·6	7	55	3	...	Calm	...	3·3	...	4·9	2·4	...	5·7	2·7	...	4·1	7·2	10				
4	2·3	1·3	...	1·9	...	2·5	...	2·5	...	7·6	...	5·1	...	12·0	20	40	4	1·2	...	5·8	...	2·9	...	6·9	...	7·4	...	9·0	...	6·0	12·1	23, 24			
5	...	7·9	...	5·3	...	8·3	...	1·7	...	8·2	6·6	...	12·4	6	35	5	...	10·6	...	4·4	...	9·7	...	4·0	...	9·4	...	3·4	...	3·4	11·8	I, 4, 5, 7		
6	...	6·1	2·5	4·7	7·1	...	4·8	...	2·0	...	5·1	...	5·1	...	13·5	23	45	6	...	11·2	...	4·6	...	13·8	...	2·7	...	10·0	2·0	...	5·2	...	14·1	9	
7	4·5	...	10·9	6·4	...	9·6	1·0	...	4·8	3·0	...	3·0	...	18·0	5	35	7	...	3·8	...	0·8	3·3	...	3·3	3·1	...	4·7	4·6	...	6·8	8·2	21					
8	4·4	...	4·4	7·7	...	2·5	3·0	...	7·9	...	3·3	...	14·6	23	25	8	4·9	...	4·9	9·0	...	6·0	10·0	...	4·1	6·9	...	6·9	14·1	14							
9	13·0	...	5·4	11·2	...	4·6	...	10·9	...	9·5	...	14·1	...	28·4	19	40	9	4·0	...	4·0	3·6	...	8·7	5·0	...	12·1	7·3	...	10·9	14·8	17						
10	5·8	...	8·7	4·0	...	6·0	...	9·0	...	1·8	...	9·6	...	1·9	...	20·0	0	5	10	2·9	...	6·9	10·0	...	2·0	13·5	...	2·7	10·3	...	2·0	13·8	15				
11	...	5·6	...	2·0	...	3·0	...	4·3	...	...	...	6·1	...	1·2	...	11·5	11	15	11	9·0	...	1·8	10·6	...	2·1	9·0	...	1·8	9·3	...	1·9	12·5	6, 11	
12	2·5	...	2·5	...	...	Calm	...	2·0	...	...	...	9·3	...	1·2	50	12	9·3	...	1·9	2·3	...	0·4	...	Calm	...	1·4	...	1·4	...	10·5	I	1	
13	1·3	...	0·9	1·3	...	0·9	7·1	...	...	...	1·4	10·8	...	...	...	19·0	23	50	13	4·2	...	0·8	6·8	...	4·6	1·8	...	1·8	8·8	...	12·7	19·0	24
14	10·0	...	2·0	...	...	0·5	2·6	...	...	...	1·5	...	0·6	...	19·1	2	20	14	1·4	...	9·7	5·6	...	1·8	8·8	...	1·8	18·4	2				
15	6·9	...	...	4·0	...	4·0	...	4·3	...	...	...	6·2	...	14·3	15	35	15	4·4	...	4·4	8·6	...	8·6	4·5	...	1·9	3·6	...	1·5	...	13·1	IO, II	
16	4·6	...	6·8	4·4	...	6·6	4·1	...	10·0	...	4·5	10·9	...	18·5	17	0	16	2·4	...	1·0	4·5	...	1·9	...	1·8	...	0·8	...	2·2	...	1·4	...	5·6	5, 6			
17	...	4·9	11·8	...	...	2·2	11·3	...	3·9	9·4	...	4·6	6·8	...	16·0	3	25	17	...	1·7	2·5	...	1·8	2·7	...	5·6	5·6	...	2·8	6·7	...	7·2	8, 12		
18	5·6	5·6	...	4·4	4·4	...	3·2	2·2	...	1·9	1·3	...	1·2	5·5	...	11·3	17	20	19	...	Calm	...	6·9	...	2·9	10·0	...	4·1	12·4	...	5·1	14·4	16, 20, 22				
19	3·2	2·2	...	6·9	...	...	2·9	6·1	...	1·2	1·1	...	1·0	5·5	...	10·8	16	55	20	10·6	...	4·4	10·6	...	4·4	11·1	...	7·5	10·9	...	10·9	16·1	23		
20	4·5	...	1·9	1·7	...	1·1	4·4	...	4·4	...	1·6	...	1·6	...	13·5	14	30	31	0·6	...	3·2	...	0·4	...	2·0	...	3·0	...	1·3	...	1·3	0·9	...	3·3	1, 3, 15, 16, 23		
21	...	1·8	4·3	...	...	4·9	...	0·4	...	2·0	...	...	...	Calm	...	8·3	8	25	21	8·6	...	12·8	10·0	...	10·0	8·1	...	8·1	10·1	...	6·7	17·0	4
22	4·0	...	4·0	Calm	...	1·3	...	0·9	...	2·5	...	1·7	...	9·7	4	15	22	8·2	...	3·4	8·9	...	8·2	...	3·4	8·5	...	3·5	...	6·4	11·8	23			
23	4·8	...	2·0	...	...	4·9	...	3·6	...	...	...	4·2	...	0·8	...	12·8	?	?	23	7·1	...	1·4	3·3	...	3·6	...	1·5	9·6	...	6·4	11·8	2	
24	7·1	...	1·4	...	...	7·1	...	1·4	...	1·4	...	6·8	...	1·3	...	12·8	?	?	24	7·9	...	6·9	...	5·5	...	1·1	5·5	...	2·3	...	9·8	2			
25	5·8	...	1·2	6·2	7·2	...	3·7	...	5·5	...	14·5	23	35	25	4·0	...	6·0	...	4·8	...	6·8	...	1·3	9·0	...	1·8	13·8	24			
26	6·8	...	4·6	...	...	1·6	8·0	...	3·1	...	7·6	...	1·8	...	18·4	4	20	26	10·6	...	4·4	10·6	...	4·4	11·2	...	4·6	7·9	...	3·3	...	13·1	2		
27	...	2·2	10·9	...	1·9	...	9·6	...	9·5	9·5	...	11·5	7·7	...	20·5	20	15	27	8·0	...	1·6	2·1	...	0·9	...	Calm	...	Cal	...	9·2	...	4					
28	...	10·6	7·1	...	6·6	...	4·4	...	3·8	2·6	...	2·4	...	3·6	...	18·8	1	45	28	1·8	0·8	...	2·1	...	2·1	0·8	...	4·2	...	4·2	...	7·2	16				
29	...	3·1	...	4·7	...	1·1	...	2·8	...	2·9	...	6·9	...	3·8	...	10·9	13	0	29	5·5	...	2·3	...	2·6	6·4	...	1·6	4·0	...	5·2	...	5·2	14·4	10			
30	...	1·7	...	8·7	...	...	9·2	...	...	9·5	...	...	9·8	...	14·8	21	10	30	...	6·9	1·4	...	7·1	1·3	...	6·5	1·0	...	5·1	8·5	...	5·1	10
31	0·8	...	3·8	...	3·7	...	5·5	...	5·6	...	8·0	...	1·3	...	6·8	13·5	14	30	31	0·6	...	3·2	...	0·4	...	2·0	...	3·0	...	1·3	...	1·3	0·9	...	3·3	1, 3, 15, 16, 23	
S+N& E	155·9	149·7	114·9	147·1	124·7	128·9	137·1	134·0								S+N& E	177·9	110·7	189·7	III·3	181·6	117·4	168·0	120·7													
W+E	61·7	54·9	48·7	62·1	53·5	38·3	41·9	40·2								W+E	89·5	-69·7	103·9	-73·5	85·4	-57·8	108·2	-77·3													

ENGLAND S.W.:—SCILLY.

Height of Head above—Ground 9·8 m., M.S.L. 49·7 m.
Height of Cups above—Ground 5·8 m., M.S.L. 45·7 m.

ENGLAND E.:—SHOEBURYNESS.*

Height of Head above—Ground 27·4 m., M.S.L. 31·4 m.

Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.	Day.	3 h.				9 h.				Max. in a Gust.	Time of Gust.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.	m/s.</th										

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ .	Remarks.	MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.							
				A _N	A _E	A _Z			o h.	6 h.	12 h.	18 h.	A _N	T.	A _N	T.
1	P	h m s	s	μ	μ	μ	km.									
	I	47 47	...	...	...	...	11700									
	PR	52 14	...	...	...	...						
	S	59 59	...	...	...	...						
	L	23 30	...	...	...	...						
	M	25 2	40	116	...	...								
5	L	15 36 50	22	8	...	...								
5		20 37 to 21 50	...	...	...	...						
6-7		23 0 to 0 50	...	...	...	...						
8		10 30 to 10 50	...	...	...	...						
18	P (?)	6 17 17	...	...	...	...						
	L	6 44	...	...	...	...						
	L	7 1	26	...	...	...							
	F	7 30	18	...	...	...							
27	P	21 59 39	...	...	...	...						
	F	22 50	...	...	...	...						

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	o h.		6 h.		12 h.		18 h.	
	A_{N}	T.	A_{N}	T.	A_{N}	T.	A _N	T.
1	μ	s	μ	s	μ	s	μ	s
2	1'4	4	...	...	2'3	4	2'3	4
3	1'7	4	1'5	4'5	1'7	5	2'2	5
4	2'3	6	1'5	6	1'9	6	1'6	6
5	1'8	6	1'3	6	1'5	6	1'2	5'5
6	1'8	5	1'4	3'5	1'2	4	1'1	5
7	1'3	8	1'1	4	1'4	4	2'8	6
8	3'1	6	2'8	6	2'3	8	4'8	8
9	3'2	8	3'5	6	2'5	8	1'9	6
10	1'9	5	2'7	5	3'1	5	1'8	5'5
11	2'5	6	2'8	6	2'3	6	2'3	6
12	1'7	5'5	1'3	6	1'3	6	1'4	4
13	1'4	5	1'6	6	3'1	6	2'6	5'5
14	3'0	6	2'6	5'5	3'1	6	3'6	8
15	4'7	8	3'6	7	1'9	6	1'8	6
16	2'1	5'5	1'6	6	1'6	5'5	1'2	5'5
17	1'2	6	0'9	6	1'0	5	1'0	5
18	0'8	6	0'8	5'5	0'8	4'5	0'8	6
19	0'9	6	1'2	4	1'4	7	1'1	6
20	1'5	6	1'2	6	2'3	6	1'6	6
21	1'8	6	1'8	5	1'6	6	1'6	4
22	1'4	5	1'0	4'5	1'0	4'5	1'1	4
23	0'9	6	1'0	6	1'2	5	1'6	6
24	1'0	5'5	0'9	6	1'0	5	1'1	4
25	1'1	4	1'1	4	1'4	5	1'6	4
26	1'5	5	2'4	6	3'2	6	4'4	6'5
27	3'9	8	3'5	7	3'6	6	2'3	6
28	2'3	6	1'8	5	2'4	4	1'1	4
29	0'9	5'5	1'0	4	0'9	4	0'9	4
30	0'8	4	1'1	4	0'9	5	1'0	4'5
31	1'1	4	0'9	4	0'9	4	0'8	6

Means for Month $\{ A_N = 1'8, T = 5'5 \}$. Normals, 1911-18 $\{ A_N = 2'5, T = 6'1 \}$.

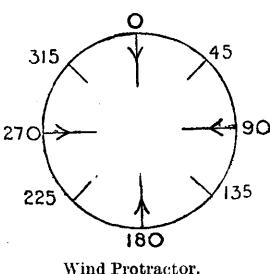
EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).

Day.	Times, G.M.T. of			Remarks.
	Commencement.	Max. Phase.		
1	h 1 57	h 3 41		Amplitude on trace 7'3 mm.
5	...	20 55		Small.
6-7	23 36	0 26		Small.
14	...	16 50		Very small.
18	...	7 0		Very small.

10. SOUNDINGS WITH PILOT BALLOONS.

Height of Station above M.S.L. = H.,
Anemometer above ground = h.

Anemometer above ground.—H.			H.	h.
Eskdalemuir	.	.	242 m.	15 m.
S. Farnborough	.	.	70 m.	31 m.
Falmouth	.	.	51 m.	12 m.
Calhrciveen	.	.	9 m.	13 m.



Notes on Pressure Distribution.

January 1919.

- 7 h. Trough stretching from W. to E. across the British Isles.
 4 h. 7 h., 13 h. Low over the British Isles ; secondary over the Bay of Biscay.
 5 h. Low over the British Isles, centred over the Channel.
 6 h. Wedge over England ; Lows W. of Cahirciveen and E. of the Shetlands.
 7 h. Deep depression centred near Cahirciveen.
 8 h. Low over the British Isles.
 10 h. Low centred N. of Scotland.
 13 h. Deep depression S.W. of Iceland ; light gradient over the British Isles.
 13 h., 18 h. Gradient steeper over the British Isles.
 14 h. 7 h., 13 h. } Deep depression centred W. of Iceland.
 15 18 h. } Deep depression N. of Scotland.
 16 h. Deep depression N. of Scotland.
 17 7 h., 13 h., 18 h. Extensive Low centred near Bergen.
 18 7 h., 13 h. Shallow Low over the North Sea, light gradient.
 19 7 h. Low over Iceland ; wedge over England.
 20 7 h. Shallow Low off W. of Ireland.
 21 13 h. High over Scandinavia and the Bay of Biscay ; Shallow Low N. of Ireland.
 23 13 h., 18 h. }
 24 7 h. S.W. to N.E. ridge across the British Isles ; deep depression over Arctic
 25 7 h.
 26 7 h. Westerly type.
 28 7 h. Extensive shallow Low covering Great Britain and France.
 29 7 h. }
 30 7 h. Anticyclonic ridge across the British Isles.
 31 7 h., 18 h.

Notes on Assessors

Eskdalemuir—
 6th, 11 h. 55 m. Barometer steady but
 very low.
 8th, 9 h. 15 m. Barometer rising quickly.
 14th, 9 h. 10 m. Fog banks rolling over
 hills.
 26th, 7 h. 55 m. Visibility excellent.

S. Farnborough—

8th, 7 h. 50 m. St.-Cu. sheet cleared off before start, detached St.-Cu. coming up.

Falmouth—

7th, 12 h. 5 m. Shower in the middle of ascent.
 16th, 11 h. 5 m. Squally.
 18th, 8 h. 50 m. } Ground mist.
 12 h. 5 m. }
 21st, 11 h. 55 m. Overcast.

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN. Taken at 13 h. G.M.T.

Day.	Type of Cloud.	Velocity-height-ratio.					Remarks.	
		Degrees from N.	Milliradians per Second.	Components.				
				W.-E.	S.-N.			
1	St.-Cu.	225°	mr/s. 2.8	mr/s. + 2.0	mr/s. + 2.0	St.-Cu. in lenticular sheets.		
3	St.-Cu.	271	2.0	+ 2.0	0.0	St.-Cu. inclined to lenticular form.		
7	St.-Cu.	168	10.0	- 2.1	+ 9.8			
8	St.-Cuf.	180	17.0	0.0	+ 17.0	St. in cumuliform masses.		
10	Ci.	174	3.0	- 0.3	+ 3.0	Ci. to Ci.-St. in bands with radiant-point 174°.		
17	Ci.	315	1.0	+ 0.7	- 0.7	" False " Ci. above Cu.-Nb.		
27	Ci.	171	2.0	- 0.3	+ 2.0	" False " Ci. in heavy sheets and tufts.		
28	Cu.-Nb.	50	12.5	- 9.6	- 8.0	Base of cloud measured.		
29	St.-Cu.	95	8.3	- 8.3	+ 0.7			
31	St.-Cuf.	70	6.8	- 6.4	- 2.3	A very low cumuliform cloud, probably stratus originally.		

Note.—The interval from January 11th to 26th was characterised by uniform cloud sheets of A.-St. and St. types, which could not be measured.

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Station.	Aurora Observations.	
			Eskdalemuir.	Richmond.			Remarks.
2	...	●	—	...	Aberdeen	...	Seen late n., moderately bright yellow-green glow, with some streamers, but hidden by clouds.
3	p. a.	}	... 2, 2	2, 2	Eskdalemuir (and many other Scottish stations)	Fine display, began 19 h. Glow 1 h. and 7 h.—9 h.	20 h.—21 h., moderately faint. Brilliant, from 19 h. 45 m. 22 h.
4							
4	p.	...	2, 2	2, 2	Seskin (Carrick-on-Suir) Valencia Observatory Roche's Point		Glow seen between 17 h. and 18 h. through gap in clouds.
5	p.	...	2, 1	2, 1	Baltasound Aberdeen		Faint arch type, late n.
6	p.	...	1, 0	1, 1	Aberdeen Balmoral Paisley		
7	p.	...	0, 1	1, 0	Paisley Fort Augustus		
9	...	□	...	...	Paisley		
16	p.	○	2, 1	2, 1	Baltasound Aberdeen Paisley	Bright but short-lived, about 21 h., curtains and streamer type.	
17	p.	...	1, 2	1, 2	Donaghadee Black sod Point Aberdeen	18 h. Bright to N.N.W., 21 h. 30 m. to 22 h. 20 m. Arch and glow, faint, 18 h.—20 h. 21 h.	
18	p.	...	2, 1	2, 2	Fort William (and other Scottish stations)	In N.N.W. 19 h.—21 h.	
19	p.	...	1, 1	2, 1	Black sod Point Baltasound		
24	...	□	...	...	Paisley		
27	p.	...	0, 1	0, 1	Baltasound		
28	p.	...	1, 1	1, 1	Fort William	21 h.	
30	p.	...	0, 2	0, 1	Baltasound Aberdeen Leith	19 h.—24 h., glow type with detached glows, moderately bright. 23 h. 22 h.	
31	p.	●	...	...	Glasgow (and other Scottish stations)		

Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at midnight of the night in question.

METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—*Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.*

Ninth Year.—No. 2. FEBRUARY 1919.]

Units based on the C.G.S. System.

[Price 1s.

1. SUNSHINE AND SOLAR RADIATION.

Day.	WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.					RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.					ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.					CAHIRCIVEEN.			
	Bright Sunshine.*		Radiation received on Horizontal Surface by Callendar Radiograph.					Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.			Bright Sunshine.*		Radiation by Ångström Pyrheliometer.			Bright Sunshine.*			
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary	Maximum.		For Day.	11.30 h. to 12.30 h.	Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	$\frac{p}{p_0}$ sec Z.	Intensity.	Total.	Per cent. of Possible.
I	hr. 0'0	% 0	j/cm² 93	% 9	mw/cm² 9	h. m. 13 25	mw/cm² 5	hr. 0'0	% 0	... ...	...	...	...	hr. 0'0	% 0	h. m. ...	...	...	...	hr. 0'0	% 0
2	0'0	0	38	4	3	15 40	2	0'0	0	...	...	...	...	0'0	0	...	...	...	...	0'0	0
3	0'0	0	0	0	0	—	0	0'0	0	...	...	...	...	0'0	0	...	...	...	...	0'0	0
4	0'0	0	151	14	14	14 27	9	0'5	5	...	...	...	...	0'0	0	...	...	...	...	...	...
5	0'0	0	59	5	3	11 37	3	0'0	0	...	...	...	...	0'0	0	...	...	...	...	0'2	2
6	0'0	0	63	5	8	11 40	3	0'0	0	...	...	...	...	3'7	42	...	...	...	...	0'0	0
7	2'6	28	326	28	22	11 25	21	1'8	19	...	...	...	...	0'0	0	...	...	...	...	7'2	77
8	x 6'0	0	427	36	25	12 50	22	x 7'3	77	55	22	Hazy	1'4	15	...	...	...	...	6'8	72	
9	3'7	39	323	26	22	12 10	22	4'6	48	47	19	Hazy	7'7	85	...	...	...	...	7'8	82	
10	2'7	28	405	32	27	12 50	24	6'0	64	51	21	Clear	x 8'5	92	12 27	Clear	2'92	83	6'8	71	
11	3'3	34	366	29	23	12 0	23	0'1	1	9	4	Misty	0'2	2	...	...	...	...	0'0	0	
12	2'8	29	361	28	25	13 0	19	4'2	43	...	...	...	...	2'5	27	...	...	...	...	0'0	0
13	0'8	8	248	19	20	13 47	19	1'9	19	...	...	...	...	0'2	2	...	...	...	...	0'0	0
14	0'0	0	138	10	12	14 0	6	0'0	0	...	...	...	...	4'5	47	...	...	...	...	...	...
15	0'3	3	246	18	21	11 9	20	0'5	5	...	...	...	...	0'0	0	...	...	...	...	1'4	14
16	0'0	0	124	9	6	11 52	6	0'0	0	...	...	...	...	0'1	1	...	...	...	...	3'5	36
17	0'0	0	140	10	13	10 50	10	0'0	0	...	...	...	...	1'5	15	...	...	...	...	0'0	0
18	0'0	0	161	11	10	14 20	7	0'0	0	...	...	...	...	2'8	29	...	...	...	...	3'6	36
19	0'0	0	178	12	20	11 45	20	0'0	0	...	...	...	...	0'2	2	...	...	...	...	0'0	0
20	0'0	0	181	12	12	10 55	8	0'0	0	...	...	...	...	0'0	0	...	...	...	...	0'4	4
21	0'5	5	328	22	26	11 50	x 26	0'5	5	...	...	...	...	0'0	0	...	...	...	...	1'3	13
22	0'0	0	230	15	18	10 5	15	0'1	1	...	...	...	...	0'0	0	...	...	...	...	2'4	23
23	0'0	0	135	9	13	10 6	9	0'0	0	...	...	...	...	0'5	5	...	...	...	...	0'6	6
24	0'0	0	109	7	11	9 8	3	0'0	0	...	...	...	...	7'0	69	...	...	...	...	6'6	63
Means	0'89	9	207	15	—	16	—	1'07	11	—	—	—	—	1'96	21	—	—	—	—	2'46	25
Normal	1'35	14	326	24	—	—	—	2'13	22	—	—	—	—	1'56	17	—	—	—	—	2'48	25
	← 35 years →	← 7 years →	← 35 years →	← 7 years →	← 35 years →	← 7 years →	← 35 years →	← 7 years →	← 35 years →	← 5 years →	← 5 years →	← 5 years →	← 5 years →	← 35 years →	← 5 years →	← 35 years →	← 5 years →	← 35 years →	← 5 years →	← 35 years →	← 5 years →

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9'1 m. H_b = 13'7 m. H_a = 26'4 m. Above Ground: h_t = 1'3 m. h_r = 0'56 m. h_a = 13'9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.		Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0-10) and Weather.		Rain 0 h. to 24 h.		Min. Temp. on Grass.		REMARKS.		Magnetism. Horizontal Force, Declination West, and Inclination.
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	
1	mb. 1020'7	mb. 1015'4	a. 76'0	a. 77'1	n 78	75	5'8	5'9	77	72	100	6	110	9	1000	1000	Fine n. Dull. ∞ during day.
2	1013'7	1016'3	77'4	77'8	79	77	6'3	6'6	76	77	100	9	110	5	10	10	o. to fair. ∞
3	1013'6	1009'2	78'8	80'5	81	77	8'0	8'9	87	86	135	6	125	6	8	9	o. d. n. and a. ● later.
4	1003'7	996'0	80'9	82'0	82	80	9'4	9'5	89	83	120	7	100	6	10	10	p. n. and a. d. later. o. p.
5	991'3	998'9	81'8	83'2	83	x 81	10'9	11'5	97	93	180	2	235	5	10	10	o. n. ● a.
6	1005'9	81'9	81'3	83	x 81	10'8	10'3	96	95	155	3	305	2	10	9●	o. to d. a. ● later.	
7	1018'4	1022'1	78'1	80'4	83	78	8'0	8'3	91	81	—	0	110	9	2	2	Fine day. \square p.
8	1020'9	1022'5	79'4	80'4	82	79	6'7	6'0	70	n 58	115	9	125	13	6	2	Fine dry day.
9	1025'1	1024'0	77'9	77'9	80	78	5'6	5'6	65	65	90	9	100	9	1	2	Fine q. \swarrow 23 h.
10	1018'5	1012'5	76'7	76'9	n 78	76	5'2	5'3	66	66	100	12	100	19	1	2	Fine q. ∞ . \nearrow p.
11	1014'7	1015'9	77'5	77'8	79	77	5'9	6'1	70	71	105	14	105	9	8	8	Fine to fair.
12	1013'6	1010'6	79'8	82'0	83	78	8'1	9'9	82	87	100	8	105	9	10	5	Dull day. Fine p.
13	1005'4	1001'1	81'4	81'9	82	x 81	9'2	9'9	84	88	100	8	120	5	10	10	Dull day, with d. p. p.
14	996'0	993'2	81'6	81'4	83	x 81	10'2	10'2	92	93	135	5	165	4	10	9	o. n. ● a. and p.
15	989'8	988'7	81'1	81'4	83	80	8'5	9'3	79	85	95	5	100	3	8	9	Fine to fair.
16	985'0	983'4	80'4	79'8	82	79	8'6	7'2	84	77	85	6	30	12	6	6	Fair.
17	987'5	987'9	78'5	77'6	79	76	6'4	6'5	71	77	25	13	25	3	1000	1	Dull day, with ∞ . Fine p.
18	1001'4	993'0	73'0	79'4	80	n 72	5'4	6'8	89	71	80	2	125	8	5	9	Fine, with \rightarrow to fair.
19	977'7	974'6	82'6	82'0	83	79	11'2	10'6	94	93	170	7	170	6	10	8	• n. and a. Dull day. \nearrow 4 h.
20	973'6	990'3	81'8	81'5	83	79	10'8	8'7	96	79	235	8	285	6	9	8	p. to o. Fine evening.
21	980'8	973'9	80'3	82'3	x 84	77	8'4	11'0	82	95	95	12	170	5	10	10	Fine to o. ●
22	986'5	996'8	81'0	79'8	82	79	9'2	7'6	86	77	315	10	355	7	10	4	o. p. to fair. Fine evening.
23	999'9	1001'7	76'8	77'0	80	75	6'0	6'8	75	84	—	1	60	2	8	2	c. \oplus a. o. to b. \square evening.
24	999'6	999'2	77'4	77'1	80	74	5'5	5'8	66	71	90	6	85	5	4	0	Fine dry day. v.
25	9																

3. METEOROLOGY :—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28'$ N. Long. $0^{\circ} 19'$ W.Heights above Mean Sea Level :—Rain-gauge Site, H = 5.5 m. Barometer, H_b = 10.4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground :—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.				
			Vapour Pressure.		Percentage.														
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.							
1	mb.	mb.	a.	a.	a.	a.	millibar.	%	%	m/s.	°	m/s.	Tenths of Sky covered.	mm.	200+				
1	1020.9	1019.0	72.4	73.3	74	72	4.9	5.8	84	93	34	3	10 \equiv *	10 \equiv *	0.7	70	2 mm. Dull. * ⁰ showers.		
2	1017.4	1017.4	72.9	72.9	74	73	4.8	4.5	78	74	45	3	10 \equiv	10	—	72	* ⁴ mm. Dull. \equiv ⁰ .		
3	1017.6	1017.4	74.0	74.0	74	73	5.2	5.4	80	82	45	2	10 \equiv	10	—	72	Dull.		
4	1014.9	1009.4	73.3	73.8	76	73	5.8	5.5	93	86	—	0	10 \equiv	10 \equiv	0.7	72	Dull, with \equiv ⁰ a. Finer later. • n.		
5	1002.8	998.3	75.3	74.1	76	74	6.1	6.1	85	93	124	4	68	3	10 \equiv	10 \equiv	8.8	68	• early. \equiv 13 h. • and * 11 h.-18 h.
6	1012.2	1013.1	73.8	75.2	76	74	5.9	6.0	92	84	—	1	101	5	10 \equiv	10 \equiv	—	71	* ²¹ mm. Dull. \equiv 15 h.
7	1019.7	1032.1	74.3	71.0	75	71	4.9	3.1	74	59	79	8	79	4	6 \equiv	0 \equiv	—	73	Fine to cloudy.
8	1036.4	1039.6	68.0	68.7	n 73	n 67	2.6	2.6	63	60	113	4	113	2	0 \equiv	0 \equiv	—	65	Fine.
9	1040.5	1037.0	68.6	71.2	74	n 67	2.2	4.2	n 51	77	113	2	101	4	0 \equiv	0 \equiv	—	n 62	—. Fine.
10	1032.1	1027.8	71.6	72.0	74	70	3.4	4.0	61	70	113	7	101	6	6	0 \equiv	—	64	—. \equiv ⁰ . o. early, then fine.
11	1025.9	1024.3	69.9	72.6	76	69	4.1	4.1	84	69	—	1	90	2	0 \equiv	? 0 \equiv	0.1	63	—. \equiv ⁰ a. and at n.
12	1024.0	1020.4	68.9	73.6	80	68	3.5	4.8	77	75	—	1	135	2	? 0 \equiv	0 \equiv	0.1	n 62	—. \equiv ⁰ a. \equiv ⁰ p. \equiv at n.
13	1015.6	1009.9	68.1	73.2	80	n 67	3.5	5.6	83	91	—	0	—	1	? 0 \equiv	? 9 \equiv	0.1	n 62	—. \equiv ⁰ a. \equiv ⁰ p. \equiv at n.
14	1004.9	1000.8	74.3	76.0	79	74	6.2	6.7	93	89	—	1	—	1	10 \equiv	10 \equiv	0.1	68	\equiv all day.
15	998.6	996.8	76.4	77.1	81	74	7.4	7.2	95	88	124	2	113	2	? 10 \equiv	10 \equiv	—	70	\equiv to 10 h. c. to o.
16	991.7	982.8	76.8	77.5	79	76	7.8	8.0	98	95	90	4	90	5	10 \equiv	10 \equiv	{ 18.6	75	\equiv ⁰ a. Dull. • a. and p.
17	980.7	986.1	81.0	76.8	83	76	10.3	7.1	97	89	191	2	45	6	10 \equiv	10	75	Dull. Showery a. • p.	
18	993.6	1003.2	74.5	75.9	77	74	6.1	6.6	89	88	11	6	—	1	10 \equiv	* 10 \equiv	9.1	73	•. * 2 h. 45 m.-15 h. 30 m. Dull.
19	998.3	987.4	74.4	78.9	79	73	6.0	8.3	89	90	79	3	146	3	10 \equiv	10	69	—. Dull.	
20	981.5	987.9	82.0	81.3	83	79	10.8	10.3	95	95	146	3	236	5	10 \equiv	10	3.9	77	Dull. • a. and p.
21	995.4	986.6	81.7	82.7	84	x 81	9.7	11.0	87	92	236	5	225	7	9	10	5.2	79	Fair to dull. • p.
22	985.1	988.8	82.7	81.0	x 85	80	10.9	9.1	91	85	203	6	259	6	10	10	2.3	80	Dull. Frequent showers.
23	994.0	1000.3	79.9	79.0	81	77	7.9	7.7	80	83	281	3	—	1	10	3	78	Dull. Fine at n.	
24	1001.7	1000.7	76.3	78.9	80	75	7.3	6.4	94	69	—	0	23	3	? 8 \equiv	10 \equiv	—	70	\equiv early. c. to o.
25	1000.6	1003.1	74.6	75.3	80	74	6.1	6.0	89	84	56	3	—	1	4 \equiv	0 \equiv	—	71	— early. Fair to fine.
26	1001.1	999.2	75.9	75.8	79	72	6.4	6.5	85	87	11	3	34	6	? 10 \equiv	10	5.6	67	\equiv to 9 h. Dull. • p.
27	1004.9	1009.7	76.3	75.9	78	75	6.4	6.6	83	88	360	4	338	3	10	10	0.6	74	• early. o. Showers p.
28	1015.0	1016.0	76.3	77.3	80	76	6.5	7.6	84	91	349	3	—	1	10 \equiv	10 \equiv	—	74	Dull. \equiv ⁰ .
Means	1008.1	1007.7	74.8	75.5	78.1	73.3	6.2	6.3	84	83	3.0	—	3.1	7.6	7.2	56.1	70.6	Monthly Totals or Means.	
Normal	1014.7	1014.6	76.9	77.3	80.3	74.9	6.7	6.9	84	83	3.8	—	3.7	—	—	39.6	—	Normals.	
	45 years				30 years				35 years				45 years						

4. METEOROLOGY :—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19'$ N. Long. $3^{\circ} 12'$ W.Heights above Mean Sea Level :—Rain-gauge Site, H = 242 m. Barometer, H_b = 237.3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground :—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Vane of Anemometer, h_a = 15 m.

I	997.6	995.0	73.3	73.1	74	73	4.5	5.3	73	87	40	4	50	4	10	10	—	71	REMARKS.			
																					o. v. p. * ⁰ p. n.	
																					Dull to o. * ⁰ p. p. \square n.	
2	992.3	990.7	72.9	73.0	75	72	5.8	5.7	95	93	50	2	—	0	10	10*	—	71	o. a. * ⁰ p. \square . Fine to o. n.	\square early. o. * ⁰ after 7 h. \square n.		
3	988.6	986.2	72.8	73.1	75	72	4.9	4.7	82	77	270	2	250	3	10	9	—	70	o.4	—		
4	983.4	980.5	72.7	70.9	74	71	5.3	4.5	88	86	—	0	20	3	10 \equiv	10	—	70	o.2	—		
5	975.9	975.4	71.5	72.5	73	71	4.8	5.2	88	88	40	5	50	6	10	10	—	70	0.3	—		
6	984.1	985.1	69.8	73.2	75	69	3.5	5.0	74	81	—	2	140	5	4	10	—	64	—			
7	993.6	1002.0	72.5	72.0	73	72	4.5	4.3	76	76	—	1	170	3	10	10	—	71	o. * ⁰ 13 h.-15 h. \equiv ⁰ n.	o. to fair. ∞ . \oplus a. and p. \square 18 h. 30 m.		
8	1005.3	1007.4	68.4	66.7	n 72	65	3.7	2.3	86	63	—	0	—	0	3 \equiv	0 \equiv	—	65	—	65	—	
9	1009.8	1008.6	64.6	64.5	74	n 62	2.0	2.3	66	72	—	0	—	0	3 \equiv	1 \square	—	n 59	n 59	— fine. ∞ . y. a. and p. \square 0 \equiv n.		
10	1004.3	1001.7	68.0	72.1	77	n 62	2.0	4.6	n 48	81	—	0	10	2	0 \equiv	4	—	n 59	n 59	— (U). Clear day. b. to o. \square n.	n 59	
11	999.5	997.9	74.2	74.9	76	72	5.9	6.0	89	85	40	9	50	5	9	10	—	70	70	o. to c. a. o. p. and n.	o. to b. ∞ . \equiv ⁰ 2 \equiv n.	
12	995.6	991.0	74.6	69.3	76	67	5.8	4.2	85	93	110	2	—	1	10	10	—	73	73	o. to b. ∞ . \equiv ⁰ 2 \equiv n.	o. to b. c. v. a., then o. q. to b.	
13	985.8	980.																				

5. GEOPHYSICS :—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.						Magnetic Character of Day.	Electric Character of Day.	Charge per cc. $\times 10^{16}$. + . | -	Air-Earth Current $\times 10^{16}$.	Potential Gradient, Volts per metre. Factor 2.27.												
	0.3 m.		1.2 m.		Daily Mean.		Extremes.		Horizontal Comp't.		Declination.		Inclination.				About 15 h.		About 15 h.		3 h.	9 h.	15 h.	21 h.			
					h	m	γ		h	m	◦	,	h	m	◦	,	h	m	v/m.	v/m.	v/m.	v/m.					
I	a.	a.	cm.	cm.	h	m	γ		h	m	◦	,	h	m	◦	,	i	o	Coulomb.	Amp/cm².	v/m.	v/m.	v/m.	v/m.			
	200+	200+	323	...	...	...	...		...	...	...	,	...	...	...	,	1	o	...	...	430	630	585	585		
	74.7	78.8	323	...	...	...	...		...	...	...	,	...	...	...	,	1	o	...	...	280	335	560	420		
	74.7	78.8	322	...	...	...	...		...	...	...	,	...	...	...	,	i	o	0.22	0.19	0.70	475	725	405	445	
2	74.7	78.6	322	...	...	...	...		...	...	...	,	...	...	...	,	i	o	0.37	0.04	0.65	305	570	420	825	
3	74.4	78.5	321	...	...	...	...		...	...	...	,	...	...	...	,
4	74.4	78.5	321	...	...	...	...		...	...	...	,	...	...	...	,
5	74.5	78.3	320	...	...	...	...		...	...	...	,	...	...	...	,	i	1	...	...	...	320	430	600	765?	
6	74.8	78.4	317	...	II	29	18385		...	...	...	,	14	21	66	57'9		o	o	0.56	0.80	0.25	365?	615	765	850
7	74.9	78.3	315	...	...	...	...		14	21	14	46'5	...	...	...	,	o	o	0.50	0.17	0.55	375	585	500	725	
8	74.6	78.2	312	...	...	...	...		...	...	...	,	...	...	...	,	o	o	...	...	...	210	475	895	895	
9	74.1	78.0	311	...	...	...	...		...	...	...	,	...	...	...	,	o	o	...	...	...	*	570	810		
10	74.0	78.0	311	...	...	...	...		...	...	...	,	...	...	...	,	o	o	0.60	0.19	0.85	*	*	630	840	
11	73.9	78.0	308	...	...	...	...		...	...	...	,	...	...	...	,	o	o	0.30	...	0.35	700	*	560	770	
12	73.9	77.9	305	...	...	...	...		...	...	...	,	...	...	...	,	o	o	...	...	...	615	*	525	840	
13	73.8	77.9	303	...	II	30	18437		14	20	14	54'3	14	15	66	55'9		2	o	0.11	0.13	0.75	825	685	350	790	
14	73.7	77.9	302	...	...	...	...		...	...	...	,	...	...	...	,	2	o	0.58	0.45	0.40	525	335	420?	895	
15	73.7	77.8	300	...	...	...	...		...	...	...	,	...	...	...	,	i	o	...	...	...	835	755	500	780	
16	73.8	77.8	299	299	...	...	...		...	...	...	,	...	...	...	,	i	2	...	...	...	280	405	-110	700	
17	73.8	77.7	300	...	...	...	...		14	27	14	45'4	...	...	...	,	o	1	...	...	...	210	475	350	405	
18	73.8	77.6	344	...	...	...	...		...	...	...	,	...	...	...	,	i	2	...	...	...	55	210	-225	390	
19	73.9	77.4	397	...	...	...	...		...	...	...	,	...	...	...	,	o	1	0.19	0.34	1.10	420	585	85	195	
20	74.8	77.5	407	...	II	17	18428		14	26	14	48'1	14	20	66	58'1		o	1	30	265	210	600	
21	75.5	77.2	410	412	...	...	...		...	...	...	,	...	...	...	,	2	2	...	...	...	55	420	-195	335	
22	77.9	77.4	408	...	...	...	...		...	...	...	,	...	...	...	,	2	1	...	...	...	165	295	125	180	
23	78.3	77.6	404	...	...	...	...		...	...	...	,	...	...	...	,	i	o	...	...	...	140	280	210	390	
24	77.7	77.8	399	...	...	...	...		...	...	...	,	...	...	...	,	o	o	0.39	0.15	0.50	445	560	585	725	
25	77.0	77.9	394	...	...	...	...		...	...	...	,	...	...	...	,	o	1	...	...	...	390	500	460	560	
26	76.5	77.9	390	...	...	...	...		...	...	...	,	...	...	...	,	o	1	...	...	...	320	475	-70	280	
27	76.5	78.0	386	...	II	14	18403		14	19	14	48'3	14	18	66	57'4		1	1	0.17	0.17	0.65	85	225	225	70	
28	76.8	78.0	381	...	...	...	...		...	...	...	,	...	...	...	,	2	o	0.52	0.22	0.25	210	390	365	420	
M.	75.1	78.0	—	—	—	—	—		—	—	—	,	—	—	—	,			—	—	—	318‡	461‡	307‡	550‡		
	77.1	79.1	—	—	—	—	—		—	—	—	,	—	—	—	,			—	—	—	—	—	—	—		

* Jet frozen.

† Insulation found poor after this reading. Defect not improbably existent for several days.

‡ Mean of 23 days only.

6. GEOPHYSICS :—ESKDALEMUIR.

Day.	North Component.			West Component.			Vertical Component.			Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 6.01.									
	Maximum. 15000 γ+.	Minimum. 15000 γ+.	Range.	Maximum. 4000 γ+.	Minimum. 4000 γ+.	Range.	Maximum. 44000 γ+.	Minimum. 44000 γ+.	Range.			3 h.	9 h.	15 h.	21 h.						
	h	m	γ	h	m	γ	h	m	γ	h	m	γ	v/m.	v/m.	v/m.						
1	16.35	1007	893	2.20	114	13.45	942	820	0.13	122	16.28	1121	1028	2.59	93	i	o	80	140	215	220
2	19.58	1040	893	10.43	147	12.31	943	792	16.53	151	16.50	1134	1055	11.43	79	i	o	65	205	125	155
3	20.29	1005	910	8.51	95	3.15	922	862	23.58	60	16.54	1114	1057	0.0	57	i	o	120	355	215	190
4	22.6	1012	920	12.42	92	13.35	955	841	18.0	114	16.45	1121	1049	2.32	72	i	o	185	80	120	55
5	19.14	1013	919	13.27	94	4.48	940	837	19.26	103	14.57	1112	1042	5.5	70	i	2a	-35	55	205	135
6	22.43	1013	924	11.11	89	11.37	928	856	21.35	72	14.30	1093	1067	3.17	26	o	o	90	115	255	340
7	5.49	979	954	12.24	n 25	12.54	910	883	1.0	n 27	20.20	1087	1078	0.0	9	o	o	80	100	90	120
8	0.43	991	949	11.11	42	0.18	921	874	1.42	47	17.0	1089	1067	1.25	22	o	o	150	285	285	425
9	19.17	1035	948	20.20	87	14.18	921	861	19.7	60	21.20	1095	1073	1.145	22	i	o	320	625	320	455
10	5.34	990	943	12.47	47	13.4	929	886	8.32	43	15.55	1086	1077	1.32	9	o	o	310	405	350	790
11	22.26	988	959	12.3	29	13.55	910	883	8.29	n 27	o	1081	1073	11.15	8	o	o	220	355	305	215
12	22.33	996	959	11.15	37	13.7	924	888	8.57	36	8.30	1079	1072	13.30	n 7	o	o	90	290	375	575
13	21.56	1089	904	18.52	185	18.30	x 990	824	22.15	166	18.52	1183	1042	22.37	141	o	o	360	570	475	475
14	18.27	1043	922	19.50	121	14.8	921	781	18.15	140	18.15	1108	1040	1.26	68	i	o	325</			

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$ Heights above M. S. L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1.48 m. h_r = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.					Min. Temp. on Grass.	Percentage of Humidity.				Rain 0 h. to 24 h.	REMARKS.	
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.		9 h.†	14 h.	21 h.	Mean.			
1	mb.	mb.	mb.	mb.	a.	a.	a.	a.	a.	200+	%	%	%	%	1.5	* 4 h.-12 h.	
2	1012.6	1012.2	1012.2	1012.3	73°	75°1	74°4	75°5	72°9	200+	98	73	91	81	0.6	* 4 h. \equiv^0 .	
3	1009.5	1008.6	1009.7	1009.3	73°7	74°2	74°6	75°2	73°5	200+	85	92	80	86	—	\equiv^2 from 5 h. to night. ● ⁰ continuous.	
4	1011.8	1011.4	1011.7	1011.6	74°8	75°2	77°1	77°6	73°5	200+	98	98	88	95	5.7	● ⁰ 4 h. ● ² 17 h. 30 m.	
5	995.7	994.7	996.1	995.5	75°4	78°7	82°4	82°8	74°0	200+	96	98	97	97	16.2	● ² night and day. \equiv^2 noon to night.	
6	1005.9	1005.1	999.2	1003.4	79°8	81°1	80°9	81°7	78°9	200+	93	89	98	93	8.0	● ² morning and evening. \equiv^0 .	
7	1008.7	1015.3	1022.2	1015.4	76°7	77°8	74°7	80°0	73°8	200+	88	66	61	72	12.7	● ² night to 8 h. Cloudless sky.	
8	1026.1	1026.2	1028.2	1026.8	69°7	72°1	71°1	n 74°0	n 68°5	200+	65°4	62	53	61	—	Cloudless sky.	
9	1028.7	1026.5	1025.4	1026.9	79°7	74°8	71°9	75°0	68°6	200+	n 65°1	49	47	62	53	—	
10	1018.2	1014.1	1014.6	1015.6	71°1	74°8	71°1	74°9	69°7	200+	59	n 43	62	55	—	A.-Cu. towards S.W. in afternoon.	
11	1014.1	1012.2	1013.5	1013.3	72°0	75°7	78°0	70°4	74°7	200+	67	49	67	61	—	—	
12	1014.6	1013.4	1012.3	1013.4	75°5	79°6	76°8	80°9	74°5	200+	70	57	84	70	—	\equiv^0 \equiv^2 21 h.	
13	1007.9	1006.6	1003.3	1005.9	77°3	79°1	79°0	80°6	75°1	200+	78°2	68°5	77	83	—	● ⁰ 4 h.-13 h. 30 m. \equiv^0 17 h. \equiv^2 20 h.	
14	997.0	994.3	994.4	995.2	78°5	79°1	78°7	79°4	78°2	200+	75°8	93	94	95	2.7	—	
15	991.4	989.3	989.9	990.2	80°6	80°8	80°4	S1°1	79°0	200+	80°4	77°0	90	100	7.4	\equiv^2 during the night to 5 h. \equiv^2 noon.	
16	982.2	978.5	977.9	979.5	78°8	83°7	81°7	83°9	78°4	200+	81°3	77°3	97	91	10.8	\equiv^2 during the night to 5 h. 30 m. \equiv^2 11 h. (mean).	
17	974.7	974.2	974.2	974.4	81°3	84°1	81°3	x 84°4	80°3	200+	82°3	77°3	95	86	6.4	● ² began 4 h. ● ² 16 h. 45 m. (very)	
18	983.3	993.7	998.5	991.8	76°7	77°7	77°2	81°2	75°2	200+	76°1	90	77	85	8.1	● ² 6 h. 30 m.-14 h.	
19	988.2	983.9	979.4	983.8	77°1	80°3	81°0	75°0	78°8	200+	70°6	97	95	97	9.0	● ² began 4 h. 40 m.	
20	974.1	981.9	989.1	981.7	81°0	82°7	81°6	S3°5	x 80°9	200+	81°9	78°6	97	90	1.6	● ⁰ 7 h. 45 m. to noon.	
21	993.0	985.0	987.1	988.4	80°0	81°7	82°4	83°0	79°8	200+	81°4	76°8	94	94	12.0	● ² 8 h. 45 m. to night.	
22	985.9	988.5	991.5	988.6	82°2	82°9	81°5	83°4	80°4	200+	82°1	79°4	84	86	—	● ⁰ 8 h. 30 m.	
23	992.3	994.4	994.9	993.9	80°2	83°0	79°7	S3°5	79°0	200+	81°1	73°1	91	62	1.3	(U) 4 h. 45 m. \equiv^2 8 h. ● ² 21 h.	
24	993.9	993.4	994.2	993.8	80°1	80°4	81°7	79°0	80°3	200+	76°3	98	95	94	2.5	\equiv^2 night to 13 h. 30 m. ● ² afterwards.	
25	990.6	993.3	997.8	993.9	79°4	80°9	79°9	81°3	78°8	200+	80°1	71°8	100	94	3.7	● ² 4 h. 45 m. \equiv^2 8 h.-11 h. 30 m. ♀ \equiv^2	
26	990.4	989.0	993.8	991.1	78°1	78°6	78°2	79°5	76°5	200+	78°2	74°1	94	91	9.0	● ² 8 h. 30 m. (continuous). [20 h.]	
27	992.7	1004.9	1006.6	1001.4	77°5	79°4	78°0	80°4	76°0	200+	78°3	73°0	80	66	1.5	▲ 14 h. 50 m. Frequent ● showers afterwards.	
28	1009.9	1009.8	1008.2	1009.3	78°2	80°3	78°5	S1°7	75°5	200+	78°8	70°0	69	68	73	—	
Means	1000.1	1000.2	1000.9	1000.4	77°1	79°1	78°1	80°2	75°7	200+	78°0	73°3	86	79	85	8.3	124.9
Normal	1009.8	1009.1	1009.7	1009.5	78°4	80°0	78°6	80°8	76°9	200+	78°9	73°6	—	75	82	—	60.1
	←	→	26 years	→	←	26 years	→	26 years	→	23 years	←	24 years	←	24 years	→	26 years	→

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).				Mean Force.	Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.												Mean Amount			
	Sunshine. *			Upper.		Lower.		Upper.			Lower.			Upper.			Lower.				
	Total.	Per cent. of possible.	Tenths.			Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.		
9 h.†	14 h.	21 h.	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	14 h.	14 h.	14 h.	14 h.	14 h.	21 h.	21 h.	21 h.	21 h.	21 h.		
1	45	I	135	2	—	0	1.5	hr.	%	10	...	...	Cu.-Nb.	NE	I	...	...	Cu.	...	7.0
2	203	3	180	I	135	I	1.7	0.0	0	10	...	...	St.-Cu.	SSW	10	...	...	...	...	10.0
3	—	0	—	0	225	2	2.0	0.0	0	10	...	...	≡Nb.	...	10	...	...	Nb.	...	10.0
4	225	3	203	4	180	5	4.0	0.9	9	10	...	...	Nb.	WNW	10	...	...	A.-Cu.	SW	10
5	180	5	203	3	293	6	4.7	0.0	0	10	...	...	Nb.	...	10	...	...	≡² Nb.	...	10.0
6	90	I	90	2	90	4	2.3	0.0	0	10	...	...	Nb.	NE	7	...	...	Cu.	NE	10.0
7	45	6	67	5	67	4	5.0	4.3	44	10	...	...	Nb.	...	0	...	...	...	...	5.7
8	90	4	113	3	45	5	4.0	9.7	100	0	...	...	Nb.	...	0	...	...	...	...	0.0
9	113	5	90	5	90	6	5.3	9.7	100	0	...	...	Nb.	...	0	...	...	...	...	0.0
10	90	6	90	6	90	5	5.7	9.1	95	0	...	...	Nb.	...	2	...	...	A.-Cu.	...	1.3
11	90	5	90	4	90	4	4.3	9.5	97	I	...	...	Nb.	...	0	...	...	A.-Cu.	...	6.0
12	113	3	157	3	67	3	3.0	5.9	60	7	A.-Cu.	NNW	...	8	A.-Cu.	NNE	...	St.-Cu.	SSW	7.7	
13	135	2	180	3	180	2	2.3	4.7	47	7	A.-Cu.	SW	...	9	...	...	St.-Cu.	SSW	10.0	
14	113	3	135	1	225	I	1.7	0.0	0	10	...	...	Nb.	...	10	...	...	...	...	9.0
15	180	2	135	2	203	2	2.0	0.4	4	7	...	...	St.-Cu., Cu.-Nb.	SW	10	...	...	≡² Nb.	...	9.3
16	113	4	203	4	203	4	4.0	1.1	11	10	...	...	Nb.	SE	8	...	...	St.-Cu.	SW	6.7
17	157	3	157	3	90	3	3.0	27	6	A.-Cu.	SSW	...	Nb.	...	6	A.-Cu.	S	Cu.-Nb.	S	8.0	
18	360	5	337	4	45	I	3.3	0.0	0	10	...	...	Nb.	SE	10	...	...	Cu.-Nb.	NNW	10.0
19	135	4	180	3	157	4	3.7	0.0	0	10	...	...	Nb.	...	...	...	...	Nb.	...	8.7
20	203	4	247	4	247	4	4.0	0.5	5	10	...	...	Nb.	S	6	...	...	Cu.	WSW	10.0
21	180	4	203	5	225	5	4.7	0.3	3	10	...	...	Nb.	...	10	...	...	Nb.	SSW	8.3
22	247	5	247	5	247	4	4.7	2.9	28	10	...	...	Nb.	WSW	7	...	...	Cu., Cu.-Nb.	W	8.3

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 8·8 m., Ground 13·7 m., M.S.L. 19·2 m.
Height of Cups above—Roof 4·6 m., Ground 7·6 m., M.S.L. 15·2 m.

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1·5 m., Ground 4·9 m., M.S.L. 57·3 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.	Day.	3 h.			9 h.			15 h.			21 h.			Vel. in Max. Hourly Run.	Time of Max.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.				S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.			
1	m/s.	10·7	h m	1	m/s.	4·9	hrs.																						
2	... 1·1	... 5·5	... 5·5	... 5·5	... 3·9	... 3·9	... 3·9	... 3·9	... 3·3	... 3·3	... 3·3	... 3·3	10·2	19 20	2	... 1·1	... 1·7	... 1·7	... 1·7	... 0·6	... 0·6	... 0·6	... 0·6	... 1·6	... 1·6	... 2·1	... 2·1	5	
3	... 0·8	... 4·2	... 4·2	... 4·2	... 5·6	... 5·6	... 5·6	... 5·6	... 3·6	... 3·6	... 3·6	... 3·6	10·2	10 45	3	... 0·9	... 2·1	... 2·1	... 2·1	... 2·5	... 2·5	... 2·5	... 2·5	... 5·7	... 5·7	... 3·8	... 3·8	17	
4	... 0·3	... 1·6	... 1·6	... 1·6	... 2·8	... 2·8	... 2·8	... 2·8	... 1·3	... 1·3	... 1·3	... 1·3	0·7	23 50	4	... 4·7	... 4·7	... 4·7	... 4·7	... 0·9	... 0·9	... 0·9	... 0·9	... 3·3	... 3·3	... 3·3	... 3·3	14	
5	... 4·9	... 5·8	... 5·8	... 5·8	... 5·8	... 5·8	... 5·8	... 5·8	... 3·8	... 3·8	... 3·8	... 3·8	7·7	8 50												6·6	3, 10		
6	... 0·6	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 0·7	... 0·7	... 0·7	... 0·7	8·2	15 45	5	... 1·1	... 1·1	... 1·1	... 1·1	... 0·6	... 0·6	... 0·6	... 0·6	... 1·6	... 1·6	... 1·6	... 1·6	22	
7	... 0·4	... 2·3	... 2·3	... 2·3	... 2·3	... 2·3	... 2·3	... 2·3	... 2·6	... 2·6	... 2·6	... 2·6	—	—	6	... 0·9	... 4·5	... 4·5	... 4·5	... 5·9	... 5·9	... 5·9	... 5·9	... 1·1	... 1·1	... 1·1	... 1·1	21	
8	... 0·4	... 2·3	... 2·3	... 2·3	... 2·3	... 2·3	... 2·3	... 2·3	... 0·5	... 0·5	... 0·5	... 0·5	7·0	4 50	8	13·0	5·4	5·4	5·4	14·0	10·6	10·6	10·6	2·1	2·1	2·1	2·1	15·4	
9	... 4·3	... 3·3	... 3·3	... 3·3	... 3·3	... 3·3	... 3·3	... 3·3	... 1·4	... 1·4	... 1·4	... 1·4	7·0	7·2		... 8·5	... 8·5	... 8·5	... 8·5	... 7·1	... 7·1	... 7·1	... 7·1	... 1·4	... 1·4	... 1·4	... 1·4	11	
10	... 3·6	... 2·4	... 2·4	... 2·4	... 2·4	... 2·4	... 2·4	... 2·4	... 2·6	... 2·6	... 2·6	... 2·6	9·2	10 50	9	5·1	... 1·0	... 1·0	... 1·0	... 1·0	... 1·0	... 1·0	... 1·0	... 1·0	... 1·0	... 1·0	... 1·0	6·6	1, 2
11	... 1·5	... 3·6	... 3·6	... 3·6	... 3·6	... 3·6	... 3·6	... 3·6	... 7·7	... 7·7	... 7·7	... 7·7	17·2	16 30	10	... 1·3	... 1·9	... 1·9	... 1·9	... 0·6	... 0·6	... 0·6	... 0·6	... 2·6	... 2·6	... 2·6	... 2·6	12, 13	
12	... 1·3	... 3·0	... 3·0	... 3·0	... 3·0	... 3·0	... 3·0	... 3·0	... 4·9	... 4·9	... 4·9	... 4·9	17·0	4 40	11	0·4	2·0	2·0	2·0	1·3	1·3	1·3	1·3	2·0	2·0	2·0	2·0	20	
13	... 1·3	... 3·0	... 3·0	... 3·0	... 3·0	... 3·0	... 3·0	... 3·0	... Calm	... Calm	... Calm	... Calm	9·8	7 5	12	0·9	2·8	2·8	2·8	1·1	1·1	1·1	1·1	2·0	2·0	2·0	2·0	13	
14	... Calm	... 1·1	... 1·1	... 1·1	... 1·1	4·0	12 0	13	1·1	2·8	2·8	2·8	1·1	1·1	1·1	1·1	2·3	2·3	2·3	2·3	12, 17								
15	... 0·6	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 4·5	... 4·5	... 4·5	... 4·5	1·6	1·4	14	1·6	2·2	2·2	2·2	1·5	1·5	1·5	1·5	2·6	2·6	2·6	2·6	1	
16	... 1·3	... 1·9	... 1·9	... 1·9	... 1·9	... 1·9	... 1·9	... 1·9	... 3·9	... 3·9	... 3·9	... 3·9	12·5	16 10	15	2·4	5·7	5·7	5·7	6·3	6·3	6·3	6·3	9·8	9·8	9·8	9·8	11·8	
17	... 4·9	... 11·8	... 11·8	... 11·8	... 11·8	... 11·8	... 11·8	... 11·8	... 5·9	... 5·9	... 5·9	... 5·9	12·5	17 0	16	8·5	3·5	3·5	3·5	4·3	4·3	4·3	4·3	5·5	5·5	5·5	5·5	10·5	
18	... 6·8	... 4·6	... 4·6	... 4·6	... 4·6	... 4·6	... 4·6	... 4·6	... 2·7	... 2·7	... 2·7	... 2·7	13·7	0 5	18	1·8	0·8	0·8	0·8	1·3	1·3	1·3	1·3	3·6	3·6	3·6	3·6	11·5	
19	... 4·3	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 2·9	... 6·4	... 6·4	... 6·4	... 6·4	9·3	10 40	19	9·3	1·9	1·9	1·9	5·3	5·3	5·3	5·3	2·8	2·8	2·8	2·8	10·5	
20	... Calm	... 1·8	... 1·8	... 1·8	... 1·8	?	?	20	2·0	10·0	10·0	10·0	5·3	5·3	5·3	5·3	12·8	12·8	12·8	12·8	18·0								
21	... 0·8	3·8	3·8	3·8	3·8	3·8	3·8	3·8	5·9	5·9	5·9	5·9	12·7	20 25	21	4·6	11·2	11·2	11·2	1·9	1·9	1·9	1·9	9·6	9·6	9·6	9·6	13·1	
22	... 5·8	1·2	1·2	1·2	1·2	1·2	1·2	1·2	Calm	Calm	Calm	Calm	10·3	16 3	22	1·2	10·2	10·2	10·2	2·8	2·8	2·8	2·8	10·5	10·5	10·5	10·5	8	
23	... 7·0	10·4	10·4	10·4	10·4	10·4	10·4	10·4	6·0	6·0	6·0	6·0	3·7	12·7	23	1·5	5·5	5·5	5·5	3·8	3·8	3·8	3·8	8·7	8·7	8·7	8·7	16, 17	
24	... 2·3	0·4	0·4	0·4	0·4	0·4	0·4	0·4	Calm	Calm	Calm	Calm	2·6	16 15	24	0·9	2·1	2·1	2·1	0·4	2·0	2·0	2·0	4·6	4·6	4·6	4·6	9·9	
25	... 2·6	6·4	6·4	6·4	6·4	6·4	6·4	6·4	3·6	3·6	3·6	3·6	0·8	15·2	25	Calm	1·4	1·4	1·4	1·4	1·8	1·8	1·8	1·8	4·0	4·0	4·0	4·0	22
26	... Calm	... 0·7	0·7	0·7	0·7	0·7	0·7	0·7	3·5	3·5	3·5	3·5	4·9	13·5	26	1·8	2·7	2·7	2·7	4·1	4·1	4·1	4·1	6·2	6·2	6·2	6·2	12, 22, 23	
27	... 8·2	3·4	3·4	3·4	3·4	3·4	3·4	3·4	1·7	1·7	1·7	1·7	1·7	10 27	27	1·4	3·3	3·3	3·3	0·8	0·8	0·8	0·8	2·6	2·6	2·6	2·6	5·2	
28	... 3·2	0·6	0·6	0·6	0·6	0·6	0·6	0·6	2·0	2·0	2·0	2·0	0·4	11·5	28	3·0	2·0	2·0	2·0	7·1	7·1	7·1	7·1	3·5	3·5	3·5	3·5	15	
$S+N+E$			65·7	88·4	48·9	93·8	69·1	103·6	69·0	101·8							$S+N+E$			78·3	97·3	76·9	106·0	93·7	95·3	82·6	90·2		
$S-N-E$			-8·1	-56·8	-0·3	-79·4	2·7	-65·8	-11·0	-71·4							$S-N+E$			11·7	-44·5	35·9	-45·6	31·5	-33·7	25·6	-53·6		

ENGLAND S.W.:—SCILLY.

Height of Head above—Ground 9·8 m., M.S.L. 49·7 m.
Height of Cups above—Ground 5·8 m., M.S.L. 45·7 m.

ENGLAND E.:—SHOEBURYNESS.*

Height of Head above—Ground 27·4 m., M.S.L. 31·4 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.	Day.	3 h.			9 h.			15 h.			Max. in a Gust.	Time of Gust.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.				S.	N.	W.	E.	S.	N.	W.	E.			
1	m/s.	m/s.	m/s.	m/s.	5·0	1·8	...	...	4·3	1·8	...	...	7·1	20 50	1	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	h m
2	1·7	8·6	1·1	...	5·7	...	...	...	4·2	1·1	...	...	2·7	12·4	2	1·9	2·8	2·8	2·8	2·0	4·8	4·8	4·8	4·8		

9. SEISMOLOGICAL DIARY.

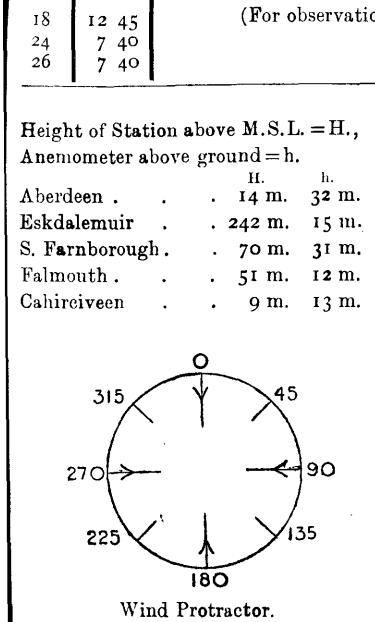
EARTHQUAKES:—ESKDALEMUIR.											MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.							
Day.	Phase.	Time, G.M.T.		Period.	Amplitudes.			Δ .	Remarks.	o h.		6 h.		12 h.		18 h.		
					A _N .	A _E .	A _Z .			A _N .	T.	A _N .	T.	A _N .	T.	A _N .	T.	
—	L F	h m s	s	km.	μ	μ	μ		Slight disturbance. P probably at o h. 2 m. 46 s.	1	μ 0.7	s 6	μ 0.8	s 6	μ 1.6	s 6	μ 1.6	s 4.5
		0 23	...		...	...	...			2	0.9	6	1.4	6	1.6	6	1.5	6
		0 40	...		...	...	...			3	1.6	6	1.1	5	1.1	5	0.9	5
										4	1.0	4.5	1.1	4	1.1	4	1.1	4
										5	1.1	4	0.9	5	1.1	4	1.1	4
2	P i F	20 6 47	...		...	...	...	No well-marked long waves.		6	1.1	4	1.1	4	0.9	5	1.3	3.5
		20 10 1	...		...	...	...			7	1.1	4	1.1	4	1.1	4	1.2	5
		21 5	...		...	...	...			8	1.2	4	1.3	5	1.6	6	1.6	6
										9	1.4	6	1.9	5	1.9	5	2.3	6
										10	2.3	6	2.2	6.5	2.4	7	2.6	8
12	P e _n e _e L F	13 3 31	...		...	...	...			11	3.9	7	3.1	6	2.3	6	1.6	6
		13 8 59	...		...	...	...			12	1.4	6	0.9	6	1.3	8	0.8	7
		13 16 48	...		...	...	...			13	0.8	6	0.7	6	0.3	4	0.3	4.5
		13 25	22		...	...	...			14	0.1	4	0.1	3	0.8	4	1.0	4
		14 30								15	0.8	6	1.0	5	1.5	6	1.7	5.5
12	L	21 29 to	...		...	...	...		Means for Month { $A_N = 1.5$. Normals, 1911-18 { $A_N = 2.6$.	16	2.3	6	1.8	5	1.6	6	1.0	6
		22 12	...		...	...	...			17	1.6	6	1.7	4	2.3	5	1.6	6
										18	1.6	6	1.7	6	1.5	4	1.5	5
										19	1.8	5	2.0	5	2.3	4	2.3	4
										20	1.9	5	2.0	4	2.3	5	2.9	4
14		15 47 to	...		...	...	...	Faint disturbance.		21	2.3	6	2.5	6	2.5	5.5	...	...
		16 14	...		...	...	...			22	2.3	5	1.6	6	2.0	5	1.9	6
										23	1.6	6	2.3	4	1.8	5	2.3	4
										24	1.6	6	1.9	5	3.1	4	2.0	4.5
										25	...	...	1.0	5	2.1	4	1.5	4
15	L F	2 24 30	18		...	...	...		Means for Month { $A_N = 1.5$. Normals, 1911-18 { $A_N = 2.6$.	26	1.9	4	1.2	4	1.2	4	1.1	4
		2 50	...		...	...	...			27	1.4	4	1.2	4	1.1	4	0.7	4
										28	0.5	4	0.6	4	1.1	4	1.1	4
21		4 56 to	...		...	...	...	Slight disturbance.		1	h m	h m	Very small.		Remarks.			
		5 30	...		...	...	...			2	...	20 20						
										12	...	13 30						
										15	...	2 28						
										24	...	2 8						
24	i e M F	2 5 48	...		...	...	...						
		2 9 24	...		...	...	...						
		2 10 51	20		17	...	...									
		2 45	...		...	...	...						

10. SOUNDINGS WITH PILOT BALLOONS.

Horizontal Velocity of Wind.

Cloud Observations.

Day.	Time of Start, G.M.T. h. m.	Geostrophic.		By Anemometer.		At Heights above M.S.L.										Time, G.M.T. h. m.	Type.	Deg. from N.	m/s.	Type.	Deg. from N.	m/s.				
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.	Deg. from N.	m/s.	1000 m.	Deg. from N.	m/s.	2000 m.	Deg. from N.	m/s.	3000 m.	Deg. from N.	m/s.	4000 m.								
ABERDEEN.																										
13	7 30	220	5	255	1'5	250	0'4	230	7'5	245	7'0	...	15	0'5	...	...	16 0	Ci.-Cu. St.-Cu.	285	...	...	...	...	...
14	7 30	270	3	225	1'0	90	1'5	315	2'0	245	2'5	15	0'5	...	...	...	...	...	250	...	...	...	...	...
6	7 45	?	?	360	2'0	?	?	130	6'5	185	2'1	290	5'5	310	11'5	9 0	A.-Cu.	135	...	Ci.-St.	295	2'0				
6	11 35	?	?	60	2'3	125	6'0	140	7'5	255	5'0	300	10'0	...	...	...	...	A.-Cu.	305	3'5	Ci.-Cu.	295	3'2	
7	7 50	210	7	140	0'9	150	6'0	175	6'0	275	3'0	...	...	...	...	9 0	St.	150	15'0	...	225	...		
8	11 30	180	16	175	4'7	175	4'3	165	8'0	130	5'0	65	6'5	25	11'5	...	Ci.-Neb.	300	...	Ci.-St.	360	3'2				
9	11 45	225	11	—	calm	225	4'2	205	10'5	145	5'0	100	8'0	55	12'5	...	Ci.-St.	115	...	Ci.	65	2'5				
10	11 45	?	?	360	3'8	75	4'0	95	11'0	125	15'5	125	24'5	125	20'0	...	...	...	...	...	...	...	...	...
13	12 10	180	7	—	calm	230	4'0	255	6'5	280	6'0	...	...	...	...	...	A.-Cu.	280	...	...	...	...
14	7 25	?	?	—	calm	245	2'0	240	5'5	275	4'8	265	4'5	...	...	...	A.-Cu.	315	...	...	...	...
14	11 40	180	6	50	0'9	70	1'4	200	3'0	265	3'6	230	3'6	...	...	...	A.-Cu.	225	...	...	...	...
21	9 20	?	?	—	calm	?	?	95	0'8	240	2'5	...	...	...	...	...	St.-Cu.	270	...	A.-Cu.	270	...		
24	12 5	?	?	360	3'0	345	2'1	340	2'7	360	4'1	330	9'0	345	14'0	...	Cu.	295	...	...	...	...
25	7 25	90	6	360	6'0	45	9'0	45	9'0	30	5'5	10	11'5	...	...	...	St.-Cu.	45?	...	Ci.	...	...		
27	7 25	40	10	360	5'0	300	11'0	30	20'5	60	3'9	...	...	...	...	...	St.	25	...	A.-Cu.	90	...		
28	7 30	—	—	calm	250	4'1	280	5'0	310	4'4	305	6'5	...	...	...	St.	225	...	...	...	...	
5000 m.																										
6	7 45	(For observations at lower levels, see above.)										280	8'5	9 0	A.-Cu.	135	...	Ci.-St.	295	2'0						
8	11 30											360	12'0	...	Ci.-Neb.	360	...	Ci.-St.	360	3'2						
SOUTH FARNBOROUGH.																										
7	12 5	45	16	45	8'0	65	9'5	70	11'5	60	9'0	70	15'5	
8	7 45	100	10	70	3'1	135	11'5	125	16'0	95	10'0	30	12'0	
11	7 40	?	?	70	3'1	105	10'5	110	13'0	115	14'5	...	...	...	...	...	...	...	...	...	...	...	...	...
12	7 50	?	?	70	?	130	9'5	145	9'5	135	12'0	...	...	...	...	...	Fr.-St.	...	...	...	...	...	...	...
28	9 45	20	10	—	light	10	6'0	20	4'2	360	4'5	345	6'0	...	...	...	...	...	...	...	...	...	...	...
FALMOUTH.																										
3	14 20	?	?	120	—	calm	295	1'7	340	4'2	240	4'7	280	5'5	14 45	Cu.	315	...	A.-St.	325	9'4	cloudless	
8	8 55	140	11	120	5'5	125	15'0	135	23'0	55	3'4	...	...	...	...	...	...	...	...	...	...	...	...	...
CAHIRCIVEEN.																										
7	8 25	?	?	—	calm	?	?	310	2'4	320	9'5	325	12'0	310	16'0	...	St., Fr.-Cu.	...	...	Ci.	...	...		
7	12 5	?	?	160	2'1	160	3'9	190	3'4	260	1'3	330	4'1	310	14'5	...	Cu.	155	...	Ci.-St.	...	...		
18	7 55	!	?	60	2'5	200	2'4	220	2'8	335	4'6	310	6'0	...	...	...	St.	225	...	Ci.	315	...		
18	12 45	?	?	170	8'5	165	7'5	185	4'2	170	3'6	225	9'5	270	8'0	...	St.-Cu.	205	...	A.-St., Ci.-St.	...	...		
3	8 5	?	?	50	1'8	35	7'0	25	7'0	355	6'5	...	...	...	...	...	A.-St., St.	360	...	Ci.-Cl.-Cu., Ci.-St.	270	...		
24	7 40	?	?	95	5'5	95	11'0	110	11'0	100	4'8	120	6'0	110	7'0	...	A.-Cu., Cu.	90	...	Ci., Ci.-Cu.	90	...				
25	7 40	?	?	—	calm	45	6'0	45	5'0	45	5'0	55	6'0	90	7'5	...	Cu., St.	...	...	Ci., Ci.-St.	115	...		
26	16 40	?	?	15	5'5	25	6'0	10	7'0	360	6'5	350	6'5	5	10'5	...	Cu.	25	...	St.-Cu.	25	...				
27	7 40	?	?	—	calm	5	5'0	5	9'5	5	10'0	5	15'5	...	...	...	St., Cu.	300	...	Ci.-Cu.	360	...		
27	16 40	?	?	335	5'5	360	6'0	345	7'0	360	7'0	5	9'5	...	...	...	Cu.	25	...	A.-Cu.	360	...		
5000 m.																										
6000 m.																										
7000 m.																										
18	12 45	(For observations at lower levels, see above.)										280	13'0	295	18'0	...	St.-Cu.	205	...	A.-St., Ci.-St.	...	...		
24	7 40											110	8'0	105	9'0	95	7'5	...	A.-Cu., Cu.	90	...	Ci., Ci.-Cu.	90	...		
26	7 40											85	8'0	...	...	...	Cu., St.	...	...	Ci., Ci.-St.	115	...		



Notes on Pressure Distribution.

February 1919.

3 13 h. Extensive anticyclone covering the British Isles.

6 7 h., 13 h. High over Scandinavia; shallow Low W. of Ireland; slight gradient.

7 7 h., 13 h. Low over France and Iceland, ridge extending from Scandinavia to the British Isles.

8 7 h., 13 h. Anticyclone covering the British Isles, centred over the North Sea.

9 13 h. Anticyclone covering the British Isles, centred over Scotland.

10 13 h. Centred over the North Sea.

11 7 h. " " " "

12 7 h. " " " "

13 7 h., 13 h. " " " "

14 7 h. Wedge over the British Isles.

15 7 h. Low to the W. and High to the E. of the British Isles.

18 7 h., 13 h. Deep depression over France, ridge over Ireland and Scotland.

21 7 h. Low over the British Isles.

23 7 h. Low over the British Isles, centred over the North Sea.

24 7 h., 13 h. Pressure very uniform over the British Isles, but slightly high over the Irish Channel.

25 7 h. E. to W. shallow trough across the British Isles, lowest over the Channel.

26 7 h., 18 h. Low over the Channel growing deeper.

27 7 h., 18 h. Shallow Low centred over the Channel.

28 7 h. Wedge over the British Isles, High over the Azores and the Baltic.

Notes on Ascents.

Aberdeen—
14th, 7 h. 30 m. Direction of cloud varying, general drift from 25°.

Eskdalemuir—
6th, 11 h. 35 m. Sky clouded with A.-St. at 12 h. 30 m., moving from 200° at 4'4 m/s.

7th, 7 h. 50 m. Pressure rising fast.

9th, 11 h. 45 m. Pressure very high (1040 mb.).

23th, 7 h. 25 m. Visibility good.

South Farnborough—
8th, 7 h. 45 m. Mist at surface, normal above.

11th, 7 h. 40 m. Thin mist to 6000 ft. (aeroplane observation).

28th, 9 h

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN. Taken at 13 h. G.M.T.

Day.	Type of Cloud.	Velocity-height-ratio.				Remarks.
		Degrees from N.	Milliradians per Second.	Components.		
				W.-E.	S.-N.	
1	Nb.	45°	8.0	- 5.7	- 5.7	Cumuliform Nb. below St.-Cu. sheet.
4	Ci.	308	4.0	+ 3.2	- 2.5	Ci. to Ci.-Cu. in high sheets.
5	Fr.-Cu.	70	6.2	- 5.8	- 2.1	Degraded broken Cu. and Cu.-Nb.
6	St.-Cu.	179	4.5	- 0.8	+ 4.5	Transition-type between Cu. and St.-Cu.
8	Fr.-St.	191	23.0	+ 4.4	+ 22.5	
11	St.-Cuf.	14	12.0	- 2.9	- 10.4	Broken St. Cumuliformis.
17	St.-Cu.	360	7.0	0.0	- 7.0	Heavy type of St.-Cu.
19	Ci.-St.	271	3.9	+ 3.9	- 0.1	Dense Ci.-St., becoming A.-St. Observation at 11 h.
25	Cu.-Nb.	30	11.0	- 5.5	- 9.5	Low small Cu.-Nb. beneath St.-Cu. sheet.
27	Nb.-Cuf.	64	10.0	- 9.0	- 4.4	Nb.-Cuf., really small low Cu.-Nb.

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Station.	Aurora Observations.	Remarks.
			Eskdalemuir.	Richmond.			
2	p. { a. }	...	1, 1	1, 1	Deerness Eskdalemuir	Glow, 22 h. Showing through clouds to N., 1 h.	
3	p.	...	1, 1	1, 1	Deerness Baltasound		
4	p.	...	1, 1	1, 1	Deerness Aberdeen Eskdalemuir	Faint glow type, 19 h.-20 h. Showing through clouds to N., 21 h.	
7	...	○	...	...	...
14	...	○	...	...	Armagh		
22	p.	...	2, 2	2, 1	Black sod Point Eskdalemuir (and other Scottish stations)	Vivid in N.W. Glow, with streamers, 21 h. 30 m.-1 h., 24th.	
23	p.	□	2, 1	1, 0	Armagh Giggleswick Valencia Observatory	Glow seen low down in N.W., with some short but brilliant streamers, 20 h.-21 h. (See M. O. Circular, No. 35.)	
24	p.	...	1, 0	0, 0	Ford Malin Head Donaghadee Aberdeen Glasgow Eskdalemuir (and numerous other Scottish stations) Malin Head	Streamer type, moderately bright, at night. 22 h. Bright glow, with arch N.E.-N.W., and till 1 h. on 28th.	
27	p.	...	2, 2	1, 2	Armagh Bidston Black sod Point Newtownforbes Dublin (City) Holyhead Valencia Observatory Haverfordwest Roche's Point Sheepstor Southport Tavistock Sheepstor Deerness Gordon Castle	Brilliant. 21 h. 12 m.-22 h. 10 m. Vivid in N.W., 21 h. 15 m. 19 h. 30 m.-20 h. 30 m. 21 h.	
28	{ a. p.	...	2, 2	1, 2	Haverfordwest Roche's Point Sheepstor Southport Tavistock Sheepstor Deerness Gordon Castle Aberdeen Balmoral	In evening and at night; still visible 28th, 4 h. 21 h. and later. Arch N.E.-N.W. Brilliant 19 h.-23 h.; very bright 22 h.-22 h. 30 m. Very fine, ruddy streamers about 3 h. 30 m. 2 h.-3 h. Very brilliant, 2 h.-3 h. 20 m.	
		...	2, 2	2, 2		Moderately faint arch, glow and streamers (slight), 19 h.-23 h.	

Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at the midnight of the night in question.

METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—*Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.*

Ninth Year.—No. 3. MARCH 1919.]

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1. SUNSHINE AND SOLAR RADIATION.

WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.						RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.						ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.						CAHIRCIVEEN.		
Day.	Bright Sunshine.*		Radiation received on Horizontal Surface by Callendar Radiograph.						Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.				Bright Sunshine.*		Radiation by Ångström Pyrheliometer.				Bright Sunshine.*	
	Total.	Per cent. of Possible.	Maximum.		For Day.		11.30 h. to 12.30 h.		Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	$\frac{p}{p_0}$ sec Z.	Intensity.	Total.	Per cent. of Possible.	
			Daily Total.	Per cent. of Planetary.	Amount.	Time.	mw/cm².	h. m.														
1	3.6	33	j/cm² 646	% 37	40	14 5	mw/cm². 39	3.5	32	...	...	...	...	1.6	15	...	...	...	...	hr. 1.7	% 16
2	4.3	39	597	34	44	12 50	27	4.6	42	...	...	...	...	0.1	1	...	...	...	...	0.3 7.2	3 66
3	0.0	0	425	24	33	11 50	33	0.0	0	...	...	...	...	2.1	19	...	...	...	...	...	...
4	0.0	0	118	6	11	15 20	6	0.0	0	...	...	...	...	9.0	83	12 25	Hazy	2.09	71	0.0 7.7	0 70
5	0.0	0	n 77	4	11	9 20	9	0.0	0	...	...	...	...	7.5	69	12 24	Clear	2.08	84	0.0 0.3	0 3
6	7.0	63	870	5	50	13 40	46	8.3	75	...	...	...	...	1.5	14	...	...	...	...	...	...
7	0.0	0	314	16	31	12 55	29	0.0	0	...	...	...	...	0.0	0	...	...	...	...	2.7 0.0	24 0
8	0.4	4	355	18	34	13 50	21	0.0	0	...	...	...	...	0.0	0	...	...	...	...	...	...
9	0.8	7	378	19	44	11 30	44	0.3	3	...	...	...	...	0.6	5	...	...	...	...	...	...
10	0.1	1	301	15	24	9 30	12	0.0	0	...	...	...	...	0.0	0	...	...	...	...	...	...
11	0.1	1	335	16	30	14 30	18	0.0	0	...	...	...	...	0.4	3	...	...	...	...	0.8 0.8	7 7
12	0.4	3	301	15	37	10 30	17	0.8	7	...	...	...	...	3.1	27	...	...	...	...	...	...
13	x 7.5	65	1015	49	59	12 20	59	7.8	67	...	...	...	...	5.7	50	...	...	...	...	3.6 3.8	31 32
14	2.8	24	823	39	54	12 0	54	5.4	46	...	...	...	...	6.7	58	...	...	...	...	...	6.0 6.0
15	1.8	15	665	31	48	9 40	44	4.1	35	...	...	...	...	5.6	48	...	...	...	...	...	...
16	1.0	9	427	20	48	9 50	18	1.7	14	...	...	...	...	2.4	20	...	...	...	...	...	...
17	0.3	3	708	32	43	11 45	43	0.2	2	...	...	...	...	6.4	54	...	...	...	...	...	...
18	1.2	10	827	37	57	11 37	57	3.0	25	...	...	...	...	0.0	0	...	...	...	...	...	...
19	0.0	0	239	11	14	11 30	14	0.0	0	...	...	...	...	0.0	0	...	...	...	...	...	...
20	0.0	0	91	4	n 6	12 8	6	0.0	0	...	...	...	...	6.1	50	...	...	...	...	...	...
21	0.0	0	377	16	37	11 38	37	0.1	1	...	...	...	...	5.4	45	...	...	...	...	...	...
22	0.4	3	470	20	49	12 46	30	0.6	5	...	...	...	...	5.4	44	...	...	...	...	...	...
23	4.7	38	922	39	57	12 0	57	3.3	27	...	...	...	...	x 10.5	85	...	...	...	...	...	...
24	2.6	21	700	29	53	12 2	53	2.7	22	...	...	...	...	3.7	30	...	...	...	...	...	...
25	5.8	47	1056	43	55	11 46	55	6.1	49	...	...	...	...	1.9	15	...	...	...	...	...	...
26	3.4	27	1073	43	63	12 50	58	6.3	50	...	...	...	...	1.2	10	...	...	...	...	...	...
27	5.4	43	922	37	62	13 50	56	5.5	44	...	...	...	...	4.7	37	...	...	...	...	...	...
28	5.0	40	933	37	x 65	13 20	44	4.5	36	...	...	...	...	4.4	35	...	...	...	...	...	...
29	7.0	55	x 1407	55	62	11 27	59	7.6	60	...	...	...	...	4.1	32	...	...	...	...	...	...
30	7.1	56	1225	47	64	13 45	x 64	x 8.7	69	...	...	...	...	1.3	9	...	...	...	...	...	...
31	3.5	27	1067	41	57	13 55	52	5.6	44	...	...	...	...	7.2	56	...	...	...	...	...	...
Means	2.45	21	634	29	43	—	37	2.94	25	—	—	—	—	3.32	28	—	—	—	—	4.03	34	
Normal	2.39	20	570	26	—	—	—	3.39	29	—	—	—	—	3.06	26	—	—	—	—	3.97	34	
	← 35 years →		← 7 years →						← 35 years →						← 5 years →						← 35 years →	

2. METEOROLOGY AND MAGNETISM :—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9.1 m. H_b = 13.7 m. H_a = 26.4 m. Above Ground: h_t = 1.3 m. h_r = 0.56 m. h_a = 13.9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.		Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0-10) and Weather.		Rain 0 h. to 24 h.		Min. Temp. on Grass.		REMARKS.		Magnetism.			
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	Horizontal Force, Declination West, and Inclination.			
1	mb. 997.0	mb. 995.1	200+	200+	a. 82.9	a. 84	78	10.5	11.4	96	94	150	6	185	6	10	10	2.9	77	o. p. n. and a. ● later.
2	994.8	999.9	83.0	77.9	83	77	8.8	7.9	72	91	215	15	360	5	8	10●	7.5	80	Fair to o. ●	
3	1008.2	1008.7	76.3	74.8	78	75	5.5	5.0	71	72	55	4	80	6	7	3	0.1	74	o. n. Fair to fine day.	
4	1005.5	1006.6	75.1	77.5	79	74	6.8	7.5	95	89	35	3	30	2	10	10—	8.2	73	o. n. * p. a. o. ∞ p.	
5	1011.2	1018.0	76.5	78.0	80	76	6.4	7.6	82	88	40	9	325	2	700	3	0.4	75	o. n. Fine ∞ day.	
6	1019.7	1011.6	79.4	81.5	82	77	8.6	10.4	90	94	260	5	220	7	7	10	4.4	74	Fine n. and a. o. p. d. p.	
7	1001.4	1003.5	80.5	78.9	83	78	9.2	8.7	89	94	265	5	—	0	10	3	6.7	79	● ⁰ n. Dull day, fine evening.	
8	1007.1	1006.3	80.3	81.1	82	77	9.8	9.6	96	89	155	2	315	2	10	9	3.9	75	Fine to o. d. n. Dull day. ● ⁰ .	
9	1009.1	1005.7	78.0	79.9	82	77	8.1	8.5	93	86	—	0	175	5	800	9	1.6	—	o. to c. n. Fair to dull day.	
10	1007.8	1002.5	82.2	79.6	x 84	x 79	10.7	8.4	93	86	225	7	240	3	10●	10.3	80	● ⁰ n. and a. Dull p.		
11	1002.3	1004.5	78.5	78.2	81	77	7.9	6.6	87	75	—	1	335	2	9	2	0.1	77	o. n. and a. Fine p.	
12	1012.0	1016.6	78.8	77.5	81	77	7.6	7.1	83	84	350	2	—	1	3	7	0.1	74	Fine day. ⊕ p.	
13	1008.5	1017.3	80.6	77.6	82	76	8.2	7.4	79	87	295	5	35	4	10	6	x 14.3	75	● to p. a. Fine p.	
14	1021.7	1015.4	74.6	78	82	73	6.1	8.1	89	88	90	2	300	1						

3. METEOROLOGY:—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28'$ N. Long. $0^{\circ} 19'$ W.Heights above Mean Sea Level:—Rain-gauge Site, H = 5.5 m. Barometer, H_b = 10.4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.			Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.					
			Vapour Pressure.		Percentage.																
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.							
1	mb.	mb.	a.	a.	a.	a.	millibar.	%	%	m/s.	m/s.	Tenths of Sky covered.	mm.	200+	a.						
1012.5	1007.5	76.9	77.9	82	74	7.1	6.9	88	79	135	5	158	3	—	70	—					
2	1005.6	1006.9	81.2	80.9	x 86	79	10.2	9.2	95	87	203	5	214	6	Dull a. Fine p. ● n.						
3	1006.3	1011.9	82.4	78.9	x 86	79	10.1	6.8	86	73	214	5	34	3	● to 7 h. 20 m. Dull to fair. Showers p.						
4	1006.7	1008.5	78.7	79.2	83	77	8.5	9.0	93	96	90	5	281	2	Dull. ≡ ⁰ to ≡ at 13 h. ● a. and p.						
5	1008.4	1006.8	80.3	76.7	82	75	10.1	7.1	99	89	180	2	34	6	● a. and p. ≡ a. ≡ ⁰ p.						
6	1014.7	1015.7	76.6	78.0	82	75	7.2	7.5	79	86	360	4	259	3	≡ o. early. Fine later.						
7	1008.5	1002.2	81.4	81.0	83	78	10.1	9.8	92	92	225	7	214	4	Dull and o. ● a. and p.						
8	1005.4	1009.4	78.9	78.7	81	78	8.1	8.0	87	88	326	3	—	1	Dull a. Dull to fine p.						
9	1008.1	1010.6	80.1	80.7	84	78	9.7	9.7	96	93	349	2	—	1	≡ ⁰ a. Fine p.						
10	1010.2	1007.1	81.1	83.8	85	77	8.9	11.2	83	87	203	5	214	10	Fair to dull. d. 15 h. and 21 h.						
11	1005.3	1001.3	83.8	84.2	x 83	11.6	10.9	90	83	214	9	191	6	10●	1.5	Dull. ● 6 h. to 10 h. 30 m.					
12	997.3	1006.7	82.9	76.4	84	76	10.3	6.4	85	83	191	5	315	7	9	2.7	Dull to fair. ● a. and from 18 h. 19 h.				
13	1013.3	1011.8	76.4	78.7	81	74	5.6	7.1	72	77	281	4	—	0	o	—	—	Fine to fair. o. n.			
14	1017.0	1019.1	75.9	78.5	80	73	5.6	7.1	74	79	360	2	—	1	o≡ ⁰	6.7	—	≡ ⁰ . Fine to fair.			
15	1022.8	1026.4	77.5	76.1	81	75	6.1	7.4	72	97	315	3	—	1	4	2.9	≡ ⁰ . Fine to fair. Showers p.				
16	1032.6	1034.8	76.8	75.3	79	74	6.3	6.3	79	87	360	5	—	0	5	—	—	Fine to fair. ≡ ⁰ n.			
17	1035.1	1032.5	78.1	77.2	82	75	7.6	6.7	86	81	338	3	11	3	10○ ⁰	8	0.2	67	≡ ⁰ . Dull to fair. ● 17 h. 50 m.		
18	1030.2	1022.6	76.0	75.7	81	73	6.0	6.5	80	88	281	2	—	0	○ ⁰	1.4	n 66	—	≡ ⁰ . Fine to dull. ● n.		
19	1013.1	999.1	76.6	76.9	n 77	74	6.9	7.2	88	89	158	5	135	6	10●	10●	72	≡ ⁰ . Dull and wet all day.			
20	992.6	996.1	75.1	75.4	78	75	6.5	6.7	91	93	79	8	191	2	10● ⁰	2 ⁰	10.9	74	Dull. ● a. and p.		
21	997.5	999.5	76.9	75.3	78	75	6.7	5.8	83	81	56	8	23	5	9○ ⁰	10	—	70	Fair a. Dull p. ✕ ⁰ 17 h.		
22	1004.9	1006.6	74.3	74.4	n 77	74	5.3	5.7	80	84	23	4	—	1	10○ ⁰ *	10○ ⁰	0.1	73	* ⁰ early. Dull to fair.		
23	1004.2	1000.0	74.5	75.0	78	n 70	5.2	5.0	76	71	45	4	68	6	? 1 ⁰	1 ⁰	n 66	—	Fine a. o. cloudy p. ≡ ⁰ .		
24	999.9	1008.3	76.7	74.3	79	74	5.2	4.0	65	60	56	10	45	4	6	—	73	Fine a. Dull to fair p. ▲ ⁰ 16 h. 15 m.			
25	1012.2	1010.4	74.0	74.1	n 77	73	4.5	4.8	69	74	68	10	34	6	10	—	71	o. to 10 h. Fine later. ∞ p.			
26	1009.6	1009.7	75.0	74.0	78	74	4.9	5.0	69	76	23	5	326	2	6	○ ⁰	—	73	Cloudy to fine a. Fine p.		
27	994.2	995.1	78.8	77.0	82	75	6.2	5.8	68	72	281	6	270	7	9	4	4.6	67	Dull to fine. ● and ▲ showers.		
28	1004.4	1006.7	77.4	76.4	79	76	4.9	5.2	n 59	67	315	7	293	3	7	4	—	73	Fine to fair. ✕ ⁰ showers p.		
29	1000.6	1003.0	73.0	74.7	78	72	4.9	5.5	81	79	11	3	304	2	0	8	5.3	72	* early. ✕. o. early, then fine.		
30	1000.0	1002.7	74.4	76.5	78	71	5.2	5.3	62	67	293	5	270	6	5	3	0.2	67	—	Fine to fair, with ✕ showers.	
31	1004.3	1002.6	76.0	75.1	80	72	6.0	6.2	80	88	270	2	—	1	7	3	—	—	—	Fine to fair. Cold showers (▲ and ✕).	
Means	1009.0	1009.1	77.7	77.3	80.8	75.0	7.1	7.0	81	83	4.9	3.5	7.0	0	6.6	77.7	71.9	Monthly Totals or Means.			
Normal	1012.8	1012.8	78.2	78.5	82.4	75.4	7.3	7.4	81	81	4.3	3.6	—	—	40.9	—	—	Normals.			
			45 years			30 years					35 years										

4. METEOROLOGY:—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19'$ N. Long. $3^{\circ} 12'$ W.Heights above Mean Sea Level:—Rain-gauge Site, H = 242 m. Barometer, H_b = 237.3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Vane of Anemometer, h_a = 15 m.

	981.0	973.5	72.0	75.4	77	67	5.3	6.7	94	93	—	I	160	5	10○ ⁰	10● ⁰	1.1	64	REMARKS.
1	966.0	969.1	78.5	74.1	80	73	8.8	5.5	98	84	200	12	230	9	10○ ⁰	4	13.4	74	● ⁰ till 7 h. 30 m. ● p. p. q. ✕ n.
2	974.6	984.2	73.0	66.8	75	64	5.5	3.0	91	79	230	6	—	1	6	0	1.5	68	✖ ⁰ till 3 h. ✕. Fine ✕ n.
3	983.7	981.9	69.5	70.4	77	63	2.9	4.2	62	84	—	0	—	0	200	—	n 60	—	✖ b. ∞ a. ✕ p. b.c. ∞ ⁰ n.
4	982.9	984.9	72.3	71.5	80	67	4.0	5.2	68	94	—	0	—	0	400	—	65	—	○ ⁰ till 5 h. 30 m. Fine a. c. e. y. p. o. to b. ✕ n.
5	983.0	979.3	73.5	75.4	79	67	6.3	6.3	100	87	200	6	220	3	10○ ⁰	9	2.7	64	✖ ⁰ till 17 h. ● ✕ a. ● △ q. to c. p.
6	972.5	976.3	73.2	72.8	74	72	5.8	5.1	93	86	40	6	50	8	10○ ⁰ *	10○ ⁰	7.7	70	✖. ✕ ⁰ 6 h. 18 h. ✕. o. = ⁰ n.
7	979.4	977.1	73.2	73.2	74.6	75	7.2	4.9	6.0	79	89	40	2	0	10	○ ⁰	7.7	71	○. = ⁰ 1 h. ✕ 5 cms. ✕. = ⁰ after 22 h.
8	976.5	979.5	76.7	74.1	80	72	6.5	6.0	82	81	—	0	—	1	10	9	3.6	73	● ⁰ till 5 h. d. a. p. ✕ p. □ n.
9	970.1	968.8	73.7	77.9	81	72	6.2	7.1	96	82	170	6	230	8	10○ ⁰ *	10○ ⁰	x 23.6	70	o. to = ⁰ ● and ✕. ✕. ● q. n.
10	971.6	974.2	76.3	75.4	79	x 75	6.4	6.5	83	90	220	11	10	2	10	—	73	o. to c. till 8 h., then o. ✕ p. q.	
11	980.2	985.1	74.3	73.1	77	73	5.5	6.0	82	98	30	11	20	7	10	8	1.5	73	Fine p. ✕. o. to b. c. ✕. ✕ p. p. ✕ n.
12	983.7	985.1	74.0	73.5	77	72	5.0	5.1	76	80	10	5	360	7	6	7	0.1	68	Fine with frequent ✕ p. ✕ p.
13	988.6	989.1	75.6	74.9	79	72	5.0	5.4	68	77	360	8	350	2	2	7	—	71	c. to fair.
14	994.9	1002.7	75.5	74.9	79	72	6.0	6.0	83	85	360	5	20	3	10○ ⁰	10	—	68	Fine = ⁰ at first, c. = ⁰ p. later.
15	1005.4	1006.7	73.8	76.1	78	68	5.3	6.3	83	83	—	1	360	4	7	7 ⁰	—	65	—
16	1006.4	1005.4	77.2	74.0	80	72	6.2	5.0	75	76	310	9	—	0	10○ ⁰	10○ ⁰	3.1	66	□. = ⁰ b. to c. y. ✕. a. = ⁰ p. p. □ n.
17	999.6	991.2</																	

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ.	Remarks.
				A _N .	A _E .	A _Z .		
1		h m s 14 34 to 14 56	s ...	μ ...	μ ...	μ ...	km.	Slight disturbance, masked by large microseisms and wind effects. Group of long waves from 14 h. 35 m. to 14 h. 42 m.
2	PR ² S L M F	3 46 24 3 56 8 4 23 4 33 30 5 45	...	...	...	...	...	P indistinct, owing to microseisms.
2	S L M	12 14 35 12 42 30 12 48	...	...	...	...	...	Similar conditions to above. F confused with wind effects.
4		8 44 to 10 5	...	...	...	...	...	Slight disturbance. Early phases indistinct. Group of long waves at 9 h. 33 m.
9		...	...	...	...	...	...	Time marking out of order during passage of moderately large disturbance 3 h.—4 h.
16		8 0 to 9 30	...	...	...	...	...	Prolonged slight disturbance. Early phases indistinct. Long waves of 20 sec. period at 8 h. 37 m.
21	L L _E L _N F	1 50 1 58 2 6 2 30	30 19 17 ...	...	...	...	...
21		17 0 to 19 0	...	...	...	...	...	Groups of long waves of low amplitude; apparently due to two separate disturbances.

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	0 h.		6 h.		12 h.		18 h.	
	A _N .	T.	A _N .	T.	A _N .	T.	A _N .	T.
1	μ 1'4	s 4	μ 1'8	s 4	μ 1'8	s 5'5	μ 3'4	s 4
2	2'6	6	4'7	5	4'1	6	4'0	6
3	4'8	6	5'8	6	3'7	6	3'1	6
4	2'7	6	1'8	6	2'1	4	2'0	4'5
5	1'7	5	1'1	5	1'1	4	0'9	5
6	1'1	4	1'0	4	0'9	4	1'2	4
7	2'1	4	2'3	4	2'4	6	2'5	5'5
8	2'5	6	2'0	6	1'6	6	2'5	6
9	2'4	6	2'7	6	3'1	6	3'1	6
10	3'1	6	2'5	7	2'0	6	2'6	6'5
11	6'8	6	8'5	6	6'2	6	5'1	6
12	2'7	6	2'1	5	1'8	5	1'5	6
13	1'4	5	1'6	6	1'2	4	1'0	5
14	1'4	4	1'4	5	1'8	5	1'5	6
15	1'8	5	1'6	6	2'3	5	2'1	7
16	2'7	6'5	3'0	6	3'2	8	2'8	7
17	2'2	7	2'8	7	1'9	7	1'6	6
18	1'3	6	0'9	5	1'0	5	1'1	4
19	1'4	4	2'3	4	2'8	4	3'7	4
20	3'5	4'5	2'0	6	2'3	4	1'4	4
21	1'4	4	1'4	3	1'1	4	0'8	4
22	0'9	4	1'0	3	0'9	4	0'3	3'5
23	0'2	4	0'8	4	0'9	3'5	0'8	4
24	0'9	4	1'0	4	1'1	4	1'0	4
25	0'7	4	0'9	4	0'3	3	0'9	4
26	0'9	4	1'0	4	0'9	4	1'1	4
27	1'4	4	2'4	6	2'7	6	6'9	5
28	5'2	5	3'9	6	2'2	5'5	2'1	6
29	2'3	6	1'2	6	2'1	6	1'9	6
30	1'8	5	1'7	5	1'2	6	2'0	4'5
31	1'6	6	1'6	6	1'8	4	1'6	6

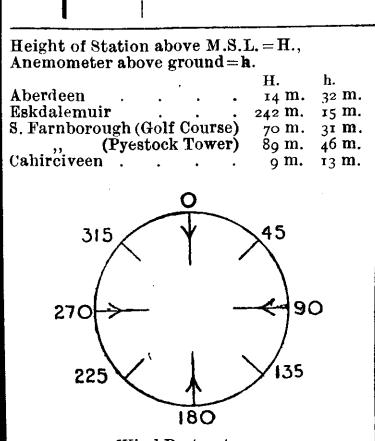
Means for Month $\{ A_N = 2'1, T = 5'1 \}$. Normals, 1911-18 $\{ A_N = 1'7, T = 5'7 \}$.

EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).

Day.	Times, G.M.T. of		Remarks.
	Commencement.	Max. Phase.	
1	h m ...	h m 14 45'5	Small.
2	...	4 39	Amplitude on trace 2'1 mm.
2	...	13 0	Amplitude on trace 3'1 mm.
4	...	9 23	Small.
9	...	4 32	Amplitude on trace 1'4 mm.
16	...	8 48	Small.
21	...	2 5	Small.

10. SOUNDINGS WITH PILOT BALLOONS.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.														Cloud Observations.					
		Geostrophic.		By Anemometer.		At Heights above M.S.L.										Time, G.M.T. h. m.		Type.	Deg. from N. mr/s	Type.	Deg. from N. mr/s
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.							
ABERDEEN.																					
7	7 30	?	?	280	2°0	5	6°0	15	5°5	285	6°0	9 °	Ci-St. Ci.	290 3°0
18	7 30	?	?	315	1°5	335	8°0	350	7°5	330	9°0	340	9°5	340?	...
ESKDALEMUIR.																				Ci. Ci. 255 3°5	
4	7 25	?	?	360	0°5	?	?	140	2°4	230	6°5	260	11°5	...	...	...	...	...	...	...
4	11 35	?	?	130	0°5	190	1°0	180	1°8	250	4°7	260	8°0	255	10°5	...	...	...	...	...
5	7 20	?	?	calm	—	35	3°2	50	4°8	15	4°7	350	4°7	...	...	...	A-St.	...	...	...
5	12 0	?	?	40	4°5	50	2°4	55	4°8	15	6°5	320	4°4	325	6°5	...	...	...	...	Ci-St. ...
15	7 15	?	?	320	5°0	340	8°5	345	8°0	355	7°5	...	...	...	...	...	St-Cu.	360	...	...
17	7 30	330	11	305	6°5	325	7°0	330	10°5	330	14°5	330	23°0	...	...	...	Cu.	...	...	{ Ci-St. 315 ...
17	11 35	330	13	340	9°0	330	10°0	340	9°5	340	21°0	...	...	...	...	...	Cu.	360	...	Ci. 315 8°5
18	7 15	?	?	calm	—	215	2°4	250	3°7	320	8°5	...	...	...	...	...	A-St.	...	...	Ci-St. 320 7°5
21	11 15	90	17	70	10°0	70	8°5	70	15°0	95	10°5	...	...	...	...	...	Cu.	...	...	A-Cu. 70 9°0
22	10 35	45	8	30	4°0	50	4°4	70	6°0	80	9°5	...	...	...	...	...	St-Cu.	65	...	Fr-Nb. ...
22	16 0	?	?	15	1°6	40	3°0	80	3°6	135	8°5	115	10°0	285	7°5	...	A-Cu.	115 4°0	...	...
23	11 35	?	?	90	0°2	25	2°0	355	0°9	30	8°0	315	3°6	...	...	...	...	...	...	...
29	7 25	340	11	290	10°0	325	9°5	325	17°5	340	11°5	...	...	...	...	...	A-Cu.	315	...	...
31	7 20	360	10	350	5°5	345	9°0	5	10°5	340	5°5	330	8°0	...	...	...	A-Cu.	...	Ci-St. 320 1°5	
31	11 50	350	13	325	10°0	320	7°0	350	11°0	330	4°8	...	...	...	...	...	Cu., A-Cu.	...	...	...
(For observations at lower levels, see above.)																					
4	11 35	255	17°0	...	...	295	7°5	295	7°5	...	...	...	...	...	...	...	Cu.	...	...	Ci. cloud 255 3°5
23	11 35	295	7°5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
SOUTH FARNBOROUGH.																					
13	7 25	280	10	250	2°2	300	13°5	300	14°0	305	12°5	...	...	...	...	...	...	...	...	Ci. cloud less ...
14	7 25	?	?	290	2°2	5	7°5	360	8°5	355	6°0	...	...	...	...	...	...	...	...	Ci. ...
18	7 35	?	?	315	1°2	5	11°0	345	10°0	350	9°5	350	17°0	...	...	...	...	...	...	...
28	7 40	315	19	290	11°0	315	15°0	330	22°5	335	15°0	340	16°0	...	...	...	...	...	...	Ci. ...
31	7 25	?	?	260	7°5	275	5°5	275	6°5	265	7°5	250	7°0	250	13°0	...	...	...	...	...
CAHIRCIVEEN.																					
5	16 55	?	?	360	7°0	350	9°5	350	13°0	360	11°0	...	...	...	...	...	Cu., St-Cu.	360	...	Ci. 360 ...
9	8 5	?	?	calm	—	270	5°0	280	7°5	280	13°5	280	16°0	...	...	...	St.	270	...	Ci. 270 ...
11	7 50	270	6	calm	—	?	?	310	5°5	290	7°5	...	...	...	...	...	...	...	...	Ci-St. ...
12	8 40	?	?	360	2°4	340	7°0	345	11°5	340	14°0	345	17°5	...	...	...	Cu.	35	...	A-Cu. 35 ...
12	16 55	340	6	330	5°0	335	4°3	340	6°0	295	11°0	310	15°0	305	15°5	...	St.	...	...	Ci-Cu., Ci-St. 315 ...
14	7 50	?	?	95	1°8	155	3°0	340	1°8	325	5°0	320	8°0	325	24°0	...	A-Cu.	315	...	Ci-Cu., Ci-St. 315 ...	
17	7 50	?	?	50	2°7	80	2°7	160	1°3	290	3°4	285	6°5	285	13°0	...	St., A-St.	270	...	A-Cu., Ci-St. 270 ...	
20	7 40	330	9	50	1°0	10	3°6	30	4°9	20	1°5	10	2°5	10	1°6	...	Cu.	45	...	Ci., Ci.-St. 45 ...	
21	8 20	60	9	25	8°5	20	13°5	40	10°0	35	9°0	...	...	...	...	...	Cu., St.	45	...	A., Cu. 45 ...
22	7 40	?	?	75	5°0	80	8°0	55	5°5	30	3°5	...	...	...	...	...	A., Cu.	245	...	Ci. ...
25	8 0	80	II	65	4°5	80	7°0	70	10°5	20	5°5	...	...	...	...	...	Cu.	...	...	...
25	12 40	?	?	50	5°0	65	5°0	90	4°1	35	7°0	25	7°5	...	...	...	Cu.	45	...	...
29	7 45	?	?	60	3°8	55	11°0	40	19°0	5	10°0	...	...	...	...	...	Cu., St-Cu.	45	...	{ A-St. 315 ...
29	12 35	?	?	50	4°8	20	7°5	15	8°0	350	8°0	320	12°0	290	22°0	...	Cu., St-Cu.	...	...	A-St. ...
30	7 55	315	12	360	8°0	350	13°5	340	10°0	345	19°5	...	...	...	...	...	Cu., St-Cu.	335	...	...
31	8 5	?	?	25	4°3	10	7°0	5	13°0	360	11°0	5	9°5	...	...	...	Cu., St-Cu.	335	...	...
(For observations at lower levels, see above.)																					
20	7 40	295	2°6	105	5°5	120	19°0	120	18°5	120	10°5	130	4°0	125	1°2	...	Cu.	45	...	Ci., Ci-St. 45 ...	



Notes on Pressure Distribution.

March 1919.

4 7 h., 13 h. Irregular trough, English Channel to Scandinavia.
 5 7 h., 13 h. Low centred near Land's End; High over the Azores.
 18 h. over the Channel;
 7 h. Low centred N. of Ireland and over Scandinavia.
 9 h. Low centred W. of Faroe.
 11 h. Deep depression N. of Scotland, light gradient over England and Ireland.
 12 h., 18 h. Low centred over England.
 13 h. Low W. of Ireland and over the North Sea.
 14 h. Shallow Low over the North Sea; High over Scandinavia and the Azores.
 15 h. Light gradient over the British Isles; High over Scandinavia and the Azores.
 17 h., 13 h. Anticyclone extending from the Azores to the British Isles.
 18 h. Deep depression centred over the Channel; High over Iceland and Azores.
 21 h., 13 h. " S. of France; Western Germany; " " "
 22 h., 18 h. Low over Scandinavia and the Bay of Biscay.
 23 h. Ridge across the British Isles.
 24 h. " "
 25 h. " 13 h. Deep depression moving northwards from Denmark to Norway.
 28 h. " "
 29 h. " 13 h. Deep depression moving northwards from Denmark to Norway.
 30 h. " "
 31 h. 13 h.

Notes on Ascents.

Eskdalemuir—
 23rd, 11 h. 35 m. Visibility good.
 29th, 7 h. 25 m. Visibility good.
S. Farnborough—
 From Mar. 28th to July the anemometer referred to is that on Pyestock Tower, not that on the Golf Course.
Cahirciveen—
 9th, 8 h. 5 m. Solar halo.
 11th, 7 h. 50 m. Overcast. Calm at the surface throughout ascent.
 12th, 16 h. 55 m. Atmosphere exceptionally clear.
 17th, 7 h. 50 m. Balloon went into A-Cu. sheet which developed temporarily.
 20th, 7 h. 40 m. Cu. cloud seen later to the S.W. with very well-marked anvil extensions to the N.W. The top of the cloud agreed with the layer of high winds at 7000 m.
 Layer of high winds at 7000 m.

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN. Taken at 13 h. G.M.T.

Day.	Type of Cloud.	Velocity-height-ratio.					Remarks.	
		Degrees from N.	Milliradians per Second.	Components.				
				W.-E.	S.-N.			
5	Ci.	272	mr/s. 2'0	mr/s. + 2'0	mr/s. - 0'1	Observation at 12 h. Coarse floccular Ci., changing to Ci-Cu. Striated at 90° to direction.		
7	Ci-St.	290	2'8	+ 2'6	- 1'0			
11	Fr-Cu.	267	20'0	+ 20'0	+ 1'0	Observation at 9 h. Fine bands of Ci. to Ci-St., radiant [point W.N.W. ⊕		
12	Cu-Nb.	15	18'0	- 17'5	- 4'7	Small low type of Cu-Nb.		
15	St-Cu.	16	3'7	- 1'0	- 3'6	Observation at 12 h.		
17	Cu-Nb.	335	25'0	- 23'0	- 10'0	Bases of clouds measured; large " anvils" seen above in [N.E.		
21	Cu.	84	6'0	- 6'0	- 0'6	Observation at 18 h.		
,"	Cu-Nb.	85	2'0	- 2'0	- 0'2	Observation at 7 h.		
22	St-Cu.	90	4'2	- 4'2	0'0	Observation at 18 h.; at 13 h. the cloud was eddying and [of no definite direction.		
,"	Cu.	275	5'2	+ 5'2	- 0'5			
23	Cu-Nb.	340	8'3	+ 7'8	- 3'1	Observation at 18 h.		
,"	Cu-Nb.	350	5'2	+ 5'1	- 0'9			
24	Cu-Nb.	25	2'0	- 1'8	- 0'8	Observation at 18 h. The St-Cu. was the remains of upper [portions of the previous Cu-Nb.		
,"	St-Cu.	345	2'5	+ 0'6	- 2'4			
25	Cu.	207	2'6	+ 1'2	+ 2'3			
29	Fr-Cu.	315	11'0	+ 7'8	- 7'8			
31	Nb.	318	9'3	+ 5'0	- 6'9	Nb., really the degraded bases of Cu-Nb.		

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Aurora Observations.		
			Eskdalemuir.	Richmond.	Station.	Remarks.	
2	p.	●	2, 1	2, 1	Deerness Gordon Castle Aberdeen Glasgow Paisley Eskdalemuir	Moderately faint arch and glow, 19 h.-22 h.	
3	p.	...	1, 1	1, 1	Eskdalemuir Gordon Castle	Glow, 21 h.	Glow, 21 h. to 1 h. on 4th.
5	p. {	...	1, 1	1, 2	Deerness Eskdalemuir	Brilliant glow 1 h.	
6	p. {	...	1, 1	2, 1	Deerness Aberdeen Fort William Eskdalemuir	Moderately faint arch, 19 h.-24 h.	
7	a. {	...	1, 1	2, 1	Eskdalemuir	Glow 1 h.	
9	...	○	...	...	...
16	...	○	...	...	Tavistock		
17	p.	...	I, 0	I, 0	Armagh		
19	p.	...	2, 2	1, 2	Baltasound	Bright.	
20	p.	...	2, 2	2, 2	Deerness		
21	p.	...	2, 2	2, 2	Paisley Eskdalemuir	22 h.	
22	p.	...	2, 1	2, 1	Fort William	Streamers $20\frac{1}{2}$ h; faint glow 21 h.	
23	p. {	○	I, 0	I, 0	Eskdalemuir		
24	a. {	○	I, 0	I, 0	Glasgow	Slight 1 h.	
27	p. {	...	I, 2	2, 2	Inverness Edinburgh		
28	a. {	...	I, 2	2, 2	Glasgow Eskdalemuir	21 h.; glow and streamers 1 h.	
28	p.	...	2, 1	2, 1	Roche's Point		
30	p.	...	I, 1	I, 1	Aberdeen Baltasound	Moderately faint arch and streamers between 21 h. and 23 h.	
31	p.	...	I, 1	I, 1	Deerness Fort William		

Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at the midnight of the night in question.

5. GEOPHYSICS:—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.								Charge per cc. $\times 10^{16}$. +. —.	Air-Earth Current. $\times 10^{16}$.	Potential Gradient, Volts per metre. Factor 2·30.						
					Horizontal Comp't.				Declination.		Inclination.										
	0·3 m.	1·2 m.	Daily Mean.	Extremes.	Mean Time.		h m	γ	h m	γ	h m	γ	h m	γ	h m	γ	Magnetic Character of Day.	Electric Character of Day.	About 15 h.	About 15 h.	
	a.	a.	cm.	cm.	h m	γ	h m	γ	h m	γ	h m	γ	h m	γ	h m	γ	coulomb.	amp/cm ² .	v/m.	v/m.	
1	200+	200+	359	362	14 51	66 57·2	1	2	0·58	185	660	z±	815
2	76·8	78·7	355	...	11 10	18394	14 18	14 51·6	14 46	66 57·4	0	0	0·13	0·13	0·70	620	645	435	560		
3	76·0	78·8	353	...	...	...	...	...	...	...	0	0	·30	·07	0·80	125	505	170	560
4	76·1	78·8	351	...	...	...	14 18	14 49·2	14 35	66 59·3	1	2	·19	·02	0·75	535	815	630	620
5	77·3	78·8	348	...	...	...	...	...	...	...	0	0	...	...	...	195	535	210	380
6	77·8	78·8	346	...	...	...	...	...	...	...	1	1	...	...	...	55	365	210	265
7	80·0	78·9	343	...	...	...	...	...	...	...	2	0	0·26	0·11	0·90	110	265	185	255
8	80·8	79·0	339	...	...	...	...	...	...	...	1	1	·52	·82	0·55	125	280	110	420
9	80·0	79·0	334	...	...	...	...	...	...	...	1	2	·43	·52	...	350	350	z±	420
10	79·7	79·1	329	...	11 8	18385	14 19	14 49·1	14 29	66 57·5	1	0	...	...	...	335	325	195	155
11	80·6	79·2	325	...	...	...	...	...	...	...	0	0	0·22	0·32	0·60	140	185	240	195
12	81·3	79·4	322	...	...	...	...	...	...	...	0	1	...	...	...	-15	225	125	365
13	81·2	79·6	320	...	...	...	...	...	...	...	0	1	...	...	...	225	280	z±	490
14	81·1	79·8	322	...	...	...	...	...	...	...	0	2	...	...	...	70	-110	210	295
15	81·0	79·9	319	...	...	...	...	...	...	...	0	2	0·15	0·54	...	70	225	z±	-335
16	80·9	79·9	315	...	...	...	...	...	...	...	1	1	...	...	...	110	55	170	265
17	80·6	80·0	314	...	11 3	18354	14 19	14 51·3	14 32	67 0·4	2	0	0·26	...	1·35	255	465	185	280		
18	81·5	80·1	315	...	...	...	...	...	...	...	1	0	...	...	...	225	310	195	85
19	83·0	80·0	315	...	...	...	...	...	...	...	1	0	...	...	...	225	480	195	365
20	84·0	80·4	313	...	...	...	...	...	...	...	1	0	...	...	...	110	365	335	335
21	82·2	80·6	312	...	...	...	...	...	...	...	1	0	0·34	0·13	0·70	255	295	310	480
22	81·1	80·8	311	...	...	...	...	...	...	...	1	0	·17	·07	0·50	265	420	265	140
23	81·9	80·8	309	...	11 9	18392	14 21	14 51·2	...	...	1	0	...	...	...	110	310	185	110
24	81·9	80·9	305	14 33	66 58·8	1	2	·13	·11	...	155	225	-845	450	
25	81·0	80·9	302	...	...	...	...	...	...	...	0	0	·24	·41	0·70	225	195	170	265
26	81·4	80·9	299	...	...	...	...	...	...	...	0	1	...	...	...	110	195	155	195
27	80·6	80·9	296	...	...	...	...	...	...	...	0	2	...	...	...	125	170	z-	z±
28	79·1	80·9	296	294	...	...	...	...	...	...	0	1	0·65	0·37	1·05	85	450	395	-30
29	79·3	80·9	300	...	...	...	...	...	14 38	66 55·9	1	2	...	...	...	185	310	z±	325
30	79·2	80·8	307	...	...	...	...	...	...	...	0	0	0·24	0·22	0·65	240	395	265	195
M.	82·1	79·8	322	—	—	—	—	—	—	—	—	—	—	—	—	194*	341*	196*	300*		
SI. 1	80·8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
←—12 years→	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

* Mean of 24 days.

6. GEOPHYSICS:—ESKDALEMUIR.

Day.	Magnetic Force.								Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 6·06.			
	North Component.			West Component.			Vertical Component.				3 h.	9 h.	15 h.	21 h.
	Maximum. 15000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	Maximum. 44000 γ +.	Minimum. 44000 γ +.	Range.	v/m.	v/m.	v/m.	v/m.	
1	h m	γ	h m	γ	h m	γ	h m	γ	h m	γ	h m	γ	h m	γ
2	20 37	1043	916	11 1 ¹	127	13 55	927	812	20 25	115	20 26	1046	1007	12 35
3	17 59	998	933	12 21	65	13 28	931	853	8 57	78	18 13	1035	1011	11 50
4	19 53	1007	936	12 16	71	14 58	940	859	9 13	81	16 16	1030	1013	12 20
5	5 33	1018	903	11 7	115	4 57	931	859	11 10	72	15 55	1037	1007	5 48
6	20 13	1005	934	11 27	71	14 42	917	861	9 48	56	21 47	1029	1007	13 6
7	23 46	1032	922	11 11	110	13 49	947	753	23 46	194	17 6	1053	1003	12 26
8	23 13	1106	888	22 27	218	2 55	926	758	22 18	168	21 17	1042	<916	>126
9	22 5	1025	872	10 55	153	13 42	936	802	0 23	134	18 38	1106	890	2 17
10	20 9	1063	918	11 28	145	14 8	936	840	22 8	96	19 22	1040	1050	6 9
11	22 7	1025	924	12 9	101	14 0	920	825	2 23	95	19 20	1116	1043	1 55
12	17 50	1008	937	12 29	71	13 58	938	857	2 58	81	18 15	1114	1068	1 25
13	16 37	1003	949	13 40	54	14 15	959	853	2 36	106	18 55	1139	1053	12 20
14	1 21	1029	946	11 47	83	15 4	914	846	2 17	68	21 16	1093	1059	12 25
15	19 56	1012	939	11 47	73	13 31	921	863	8 55	58	21 48	1081	1049	12 10
16	21 57	1038	945	11 30	93	13 25	927	855	9 3	72	21 40	1114	1056	25
17	18 16	1029	914	22 51	115	14 28	981	810	20 48	171	16 41	1138	1009	23 35
18	19 24	1095	852	9 27	243	15 1	970	779	20 45	191	16 51	1192	988	22 26
19	16 45	1047	881	4 11	166	16 47	947	818	21 12	129	16 56	1143	941	4 25
20	23 33	1034	897	11 16	137	14 19	928	840	3 5	88	19 19	1101	1022	2 56
21	16 10	1017	934	11 54	83	20 14	932	799	22 5	133	19 47	1114	1045	1 38
22	20 35	1032	917	10 47	115	13 53	926	836	23 49	90	19 45	1113	1033	2 0
23	22 57	1071	922	11 3	149	14 24 ¹	928	804	23 19	124	18 9 ³	1087	1004	23 55
24	19 25	1009	928	11 29	81	13 54	938	845	0 40	93	19 11	1092	1005	{ 0 8 }
25	18 10	1037	943	15 34	94	13 48	928	843	19 42	85	19 24	1108	1060</	

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12'$ N. Long. $2^{\circ} 6'$ W.

Heights above M.S.L. :—H = 54 m. H_b = 55 m. Above Ground :—h_t = 1.48 m. h_f = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.					Min. Temp. on Grass.	Percentage of Humidity.				REMARKS.
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.		9 h.†	14 h.	21 h.	Mean.	
1	mb. 998.7	mb. 1000.1	mb. 1004.2	mb. 1001.0	a. 200+	a. 200+	a. 200+	a. 200+	a. 200+	a. 200+	% 62	68	82	71	—
2	1010.5	1011.5	1012.0	1012.0	79.2	80.2	77.4	n 81.0	74.7	78.5	70	58	71	66	—
3	1015.5	1014.2	1014.1	1014.6	79.4	81.0	77.5	82.0	75.9	79.2	69.7	69	74	63	—
4	1014.9	1014.7	1016.1	1015.2	80.2	82.1	77.8	82.7	75.9	79.7	70.0	68	72	62	—
5	1015.0	1013.3	1012.7	1013.7	81.3	85.1	80.2	85.6	77.0	81.8	72.4	49	48	78	58
6	1012.6	1011.7	1011.0	1011.8	81.6	83.2	79.6	84.0	77.6	81.2	70.7	79	57	71	—
7	1007.4	1004.6	1003.1	1005.0	83.0	81.9	80.2	83.3	77.2	81.1	71.1	69	77	81	—
8	1000.1	1000.7	1001.5	1000.8	82.4	84.3	80.4	85.0	78.4	82.1	71.1	82	69	91	81
9	1002.9	1004.6	1008.7	1005.4	79.3	83.5	79.8	84.3	79.0	81.2	73.1	92	64	78	78
10	1009.9	1011.7	1015.4	1012.3	81.1	82.1	82.7	83.0	78.1	81.4	71.3	97	98	100	98
11	1018.6	1017.8	1016.7	1017.7	83.1	83.6	83.3	83.9	82.2	83.2	81.9	91	96	96	94
12	1012.5	1012.3	1011.1	1012.0	82.7	84.4	81.5	84.9	x 82.4	83.2	82.2	100	86	94	93
13	1006.6	1006.5	1003.3	1005.5	83.8	80.5	84.4	79.7	82.0	76.8	65	68	90	74	—
14	985.3	982.5	982.6	983.5	82.4	82.3	80.7	83.7	79.8	81.8	78.7	95	90	70	x 10.0
15	981.3	986.2	993.9	987.1	82.3	81.8	81.4	83.6	78.0	81.4	77.3	75	88	78	80
16	1004.9	1008.8	1015.1	1009.6	81.8	83.3	81.1	84.3	80.1	82.1	76.4	62	59	82	68
17	1021.8	1023.3	1023.5	1022.9	83.4	84.7	81.9	85.4	79.3	82.9	71.5	69	65	93	76
18	1024.3	1024.5	1023.9	1024.2	84.2	83.1	81.4	85.7	81.0	83.1	78.1	79	95	95	90
19	1022.9	1022.7	1022.4	1022.7	87.6	89.4	86.0	x 90.1	81.2	86.9	75.0	72	68	77	72
20	1024.9	1026.3	1028.1	1026.4	84.3	83.7	79.2	84.3	78.6	82.0	79.8	85	77	67	76
21	1029.9	1028.6	1028.2	1028.9	79.5	81.2	78.6	82.6	78.3	80.0	74.9	61	68	68	66
22	1026.2	1023.8	1021.8	1023.9	79.8	83.3	79.3	84.0	77.3	80.7	73.2	70	57	62	63
23	1017.8	1015.9	1013.8	1015.8	83.5	85.7	82.4	86.7	77.8	83.2	71.0	75	58	82	72
24	1011.1	1009.9	1011.0	1010.7	82.0	82.4	80.8	84.5	80.0	81.9	75.7	69	64	77	70
25	1015.3	1015.0	1012.6	1014.3	82.6	83.9	80.8	85.0	78.5	82.2	72.2	59	43	86	63
26	1006.9	1007.3	1010.5	1008.2	83.6	84.0	80.7	84.0	80.0	82.5	74.9	68	54	n 39	54
27	1007.3	999.7	1001.1	1002.7	81.7	81.2	77.3	82.9	76.0	79.8	71.1	68	89	46	68
28	998.5	1002.2	1005.5	1002.1	77.6	79.9	79.0	n 81.0	n 73.7	78.2	71.6	60	46	53	53
29	1008.7	1009.8	1010.3	1009.6	79.2	81.3	80.2	81.7	77.9	80.1	69.5	57	56	45	53
30	1008.9	1008.1	1008.2	1008.4	80.3	82.4	82.5	84.1	77.6	81.4	72.3	85	88	86	1.3
Means	1010.7	1010.6	1011.5	1010.9	81.7	83.1	80.5	84.0	78.3	81.5	73.7	73	68	76	73
Normal	1009.0	1008.7	1009.0	1008.9	82.2	84.1	81.3	85.1	79.4	82.4	75.6	?	67	81	?
	←	26 years	→	←	26 years	→	26 years	→	23 years	←	24 years	→	26 years		

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).			Mean of Force	Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.														
					Sunshine.*		Upper.		Lower.		Upper.		Lower.		Upper.		Lower.		
	9 h.†	14 h.	21 h.		Tenths.	Total.	Type.	Direction.	Type.	Direction.	Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.
					9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	14 h.	14 h.	14 h.	14 h.	21 h.	21 h.	21 h.	21 h.	Mean Amount
1	270° 2	225° 3	67° 4	3° 0	8·8	70	6	A.-Cu.	W	Cu.-Nb.	...	4	A.-Cu.	SW	Cu.	SW	2	...	4°
2	67 4	45 4	45 3	3° 7	11·4	88	1	...	...	Cu.	ENE	6	...	...	Cu., Cu.-Nb.	ENE	0	...	2° 3
3	45 3	23 3	45 1	2° 3	8·4	65	0	...	...	...	...	1	...	...	Cu.	ENE	0	...	0° 3
4	23 3	67 4	45 3	3° 3	13° 0	100	0	...	...	...	...	2	...	...	Cu.	NE	0	...	0° 7
5	90 2	337 3	0 2	2° 3	12·4	94	0	...	...	...	...	0	...	...	...	...	3	Cl.	1° 0
6	360 2	247 3	23 2	2° 3	1° 1	8	10	...	...	...	...	8	...	...	St.-Cu.	ESE	0	...	6° 0
7	180 1	270 2	293 1	1° 3	0·6	4	7	...	...	...	...	10	...	...	St.-Cu.	SW	7	A.-Cu.	...
8	270 4	270 4	247 2	3° 3	11·2	85	4	...	...	Cu.	WNW	5	...	...	Cu.	W	1	...	8° 0
9	337 1	293 3	293 3	2° 3	7·1	54	0	...	...	Nb.	NW	4	...	...	Cu.	WNW	0	...	4° 7
10	270 3	293 4	270 3	3° 3	0·0	10	...	...	...	Nb.	...	10	...	...	...	...	...	Nb.	10° 0
11	247 3	247 4	225 4	3° 7	0·0	0	10	...	...	...	...	10	...	...	Nb.	...	10	...	10° 0
12	270 3	270 4	293 3	3° 3	0·8	6	10	...	...	...	...	10	...	...	...	...	8	...	9° 3
13	337 3	225 4	247 5	4° 0	10·9	81	6	...	...	Cu.	NW	3	...	...	Cu.	W	10	...	6° 3
14	225 5	247 5	247 6	5° 3	2·7	20	10	...	...	Nb.	SW	8	...	...	Cu.-Nb.	W	7	...	Cu.-Nb.
15	270 5	293 5	293 5	5° 0	5·5	40	7	Ci.-Cu.	W	Cu.-Nb.	WNW	8	...	...	Cu.-Nb., Nb.	NW	6	Ci.	Fr.-Cu.
16	315 5	337 5	315 4	4° 7	11·1	81	7	...	...	Cu., Cu.-Nb.	NW	6	...	...	Cu., Cu.-Nb.	NNW	7	A.-Cu.	NW
17	337 3	270 3	315 3	3° 0	9·0	66	3	Ci., A.-Cu.	NW	...	...	6	Ci.-Cu.	NW	Cu.	WNW	7	A.-Cu.	...
18	315 2	337 2	360 3	2° 3	7·0	51	2	Ci.	N	...	...	8	...	...	Cu.-Nb.	NNW	9	...	6° 3
19	67 3	90 2	67 3	2° 7	13·5	98	2	A.-Cu.	NE	...	...	0	...	...	...	...	0	...	0° 7
20	45 3	67 6	67 5	4° 7	6·6	48	10	...	...	...	...	3	...	...	Cu.-Nb.	NE	1	...	4° 1
21	90 5	67 6	67 5	5° 3	8·3	60	8	...	...	Cu.-Nb.	ENE	7	...	...	Cu.	NE	2	...	5° 7
22	67 5	67 4	45 3	4° 0	13·4	96	4	...	...	...	...	2	Ci.-Cu., A.-Cu.	NE	...	...	0	...	2° 0
23	360 2	337 4	315 2	2° 7	13° 0	92	1	...	...	...	...	0	...	...	...	...	6	...	2° 7
24	360 3	315 3	45 4	3° 3	8·2	58	4	Ci.	...	...	...	10	...	...	Nb.	NW	3	...	5° 7
25	337 3	293 5	315 2	3° 3	12·1	85	4	Ci.	...	Cu.	N	4	Ci.-St.	...	...	...	4	...	4° 0
26	293 4	315 5	360 5	4° 7	7·7	54	9	...	...	Cu.-Nb., Nb.	WNW	6	...	...	Cu.-Nb.	NW	2	...	5° 7
27	270 4	270 5	337 5	4° 7	5·8	41	2	...	...	Nb.	W	8	A.-Cu.	W	Cu.-Nb., Nb.	W	2	...	4° 0
28	360 6	360 4	360 3	4° 3	9·6	67	8	...	...	Cu.-Nb.	N	7	A.-Cu.	N	Cu.-Nb.	N	4	...	6° 7
29	23 5	360 4	45 4	4° 3	5·3	37	9	...	...	Cu.-Nb.	N	5	A.-Cu.	NNW	Cu.	NNW	3	...	5° 7
30	315 3	315 4	337 3	3° 3	2·2	15	10	...	...	Nb.	NW	8	...	...	Cu.-Nb., Nb.	NNW	10	...	9° 7
Means	3° 3	3° 9	3° 4	3° 5	7·6	55	5·8	—	—	—	—	5·6	—	—	—	4° 1	—	—	5° 3
Normal	3° 6	4° 0	3° 5	3° 7	7·3	53	6·0	—	—	—	—	5·0	—	—	—	5° 1	—	—	5° 4

* For method of estimation, see Introduction.

[†] The first hour of observation was changed to 9 h. on Jan. 1st, 1919.

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 88 m., Ground 13'7 m., M.S.L. 19'2 m.
Height of Cups above—Roof 4'6 m., Ground 7'6 m., M.S.L. 15'2 m.

SCOTLAND N.:—DUNDEE.

Height of Cups above—Roof 1'5 m., Ground 4'9 m., M.S.L. 57'6 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.	Day.	3 h.			9 h.			15 h.			Vel. in Max. Hourly Run.	Time of Max.					
	S.	N.	W.	S.	N.	W.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.									
I	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	hrs.													
2	3'9	...	...	0'4	...	2'0	...	3'7	...	5'5	...	1'4	...	3'3	12'2	10	5	1	5'6	...	5'6	...	7'3	...	3'0	...	3'3	9'2	I	
3	...	Calm	...	...	Ca	lm	...	2'7	1'8	3'5	...	3'5	...	3'5	8'2	21	55	2	8'5	...	8'5	...	10'9	...	2'1	...	2'1	11'1	9	
4	1'6	...	4'0	...	4'3	...	1'6	...	4'0	...	4'0	...	4'0	...	4'0	9'4	7	0	3	3'1	...	4'7	...	2'1	...	5'2	11'1	24			
5	...	Calm	...	o'6	...	1'5	...	0'6	2'9	...	2'7	...	4'1	...	4'1	9'3	22	30	4	5'2	...	2'1	...	7'8	...	11'7	14'1	9, 11			
6	...	6'6	...	...	5'9	...	1'5	...	7'4	...	1'1	...	5'5	...	11'7	14	45	5	Ca	lm	...	5'7	...	13'7	...	2'5	12'6	10'1		
7	...	6'2	...	...	6'9	...	4'0	...	4'0	...	4'7	...	4'7	...	10'7	18	0	6	Ca	lm	...	7'9	...	3'6	...	8'8	...	3'6	9'8	13, 14
8	2'5	...	2'5	...	4'9	...	3'3	...	6'6	...	4'4	...	4'1	...	2'7	12'8	16	10	7	5'2	...	3'4	...	2'7	...	4'1	...	2'3	7'5	4	
9	1'4	...	1'4	...	5'2	...	5'7	...	3'8	...	4'0	...	6'0	...	13'8	17	20	8	Ca	lm	...	2'0	...	1'8	...	4'2	...	0'8	5'9	19, 22	
10	0'8	...	4'2	...	7'9	...	5'0	...	1'3	...	3'0	...	1'1'8	11	45	9	2'0	...	0'4	...	4'4	...	1'7	...	8'7	...	2'8	8'9	15		
11	3'5	...	3'5	...	5'5	...	2'3	...	4'0	...	4'7	...	4'7	...	12'2	6	20	10	2'3	...	5'5	...	1'0	...	9'1	...	3'8	6'1	14		
12	5'8	...	5'8	...	8'1	...	5'4	...	4'7	...	7'1	...	3'8	...	17'5	3	55	11	6'8	...	1'3	...	7'1	...	1'4	...	5'7	15'4	23		
13	4'0	...	4'0	...	6'0	...	3'7	...	3'7	...	0'7	...	3'5	...	15'7	10	30	12	6'7	...	6'7	...	7'4	...	4'1	...	10'0	4'4	2		
14	2'9	...	6'9	...	3'1	...	7'6	...	6'8	...	4'6	...	5'7	...	15'6	22	20	13	4'9	...	3'3	...	11'8	...	5'7	...	4'5	11'8	9		
15	9'1	...	3'8	...	3'8	...	5'8	...	9'1	...	3'8	...	1'8	...	18'5	5	45	14	3'0	...	1'3	...	5'6	...	1'6	...	8'0	10'0	23, 24		
16	6'4	...	2'6	...	9'0	9'0	...	12'0	12'0	...	11'6	...	11'6	...	24'1	15	40	15	6'9	...	6'9	...	8'0	...	1'6	...	1'0	10'5	14		
17	...	13'4	13'4	...	13'4	9'0	...	7'3	3'0	...	1'8	0'8	...	24'3	4	0	16	2'1	...	2'1	...	3'0	...	3'0	...	4'9	7'4	16			
18	0'8	3'8	...	4'4	...	4'4	...	4'4	...	3'6	...	2'4	...	11'5	10	5	17	2'8	...	1'1	...	10'0	...	2'0	3'6	...	2'4	4'4	10'2	9	
19	3'5	...	3'5	...	3'6	...	2'4	...	4'3	...	1'8	...	4'0	...	8'0	11	45	18	4'0	...	9'7	...	4'9	...	3'6	3'6	...	4'0	9'7	12'1	2
20	5'5	...	6'4	...	2'2	...	11'3	...	1'0	...	10'6	...	3'6	...	2'3	16'5	3	5	20	5'7	...	5'7	...	8'5	...	1'6	...	5'1	5'1	II	
21	...	1'8	3'0	...	2'0	...	0'7	3'5	...	0'5	2'6	...	8'2	0	35	21	5'9	...	6'2	...	...	...	5'1	...	1'0	...	1'7	2'5	5	
22	0'4	2'0	...	1'0	...	2'4	...	1'3	...	3'0	...	1'1	...	5'8	18	40	22	3'3	...	3'3	...	4'4	...	6'6	...	1'7	6'2	12			
23	0'6	2'9	...	2'5	2'5	...	2'5	2'5	...	3'0	2'0	...	8'7	10	35	23	2'3	5'5	...	4'2	4'2	...	4'3	1'8	...	2'8	1'1	8'5	18		
24	2'0	3'0	...	5'7	2'4	...	7'7	1'5	...	3'2	0'6	...	15'0	12	50	24	Ca	lm	...	3'0	...	3'0	...	4'2	6'2	...	1'0	5'1	10'5	6	
25	2'1	5'2	...	2'8	6'7	...	4'0	...	6'0	...	10'5	...	10'5	...	16'1	21	35	25	4'9	...	1'2	6'1	...	3'0	...	3'0	...	7'4	4'9	10'5	
26	2'5	12'6	...	14'5	6'0	...	10'9	2'2	...	4'0	1'0	...	23'5	7	15	26	10'5	...	10'6	4'4	...	6'8	4'6	...	4'1	2'7	13'1	7			
27	...	8'2	...	13'1	2'6	...	14'5	6'0	...	2'1	6'0	...	31'1	18	55	27	9'8	...	14'6	6'1	...	8'8	8'8	...	13'5	2'7	17'7	24			
28	...	13'5	2'7	...	13'8	...	15'2	...	6'3	...	14'5	2'9	...	28'1	10	30	28	19'7	...	18'0	...	13'3	5'5	...	10'6	2'1	21'3	2			
29	...	13'0	5'4	...	9'2	...	3'8	...	8'7	1'7	...	7'1	4'7	...	18'2	2	20	29	5'6	5'6	...	4'9	...	2'5	6'1	...	1'3	6'8	8'9	I	
30	6'8	4'6	...	4'4	4'4	...	1'8	2'7	...	2'2	3'2	...	10'8	22	55	30	4'3	...	0'9	4'5	...	4'6	6'8	...	4'8	...	2'0	...	9'2	20	
S+N& W+E	105'0	132'5	136'8	132'3	153'6	128'3	125'6	104'8							S+N & W+E	128'9	99'5	172'7	137'9	130'5	171'7	117'5	135'7								
S-N & W-E	-30'6	87'9	-44'0	99'5	-30'2	87'1	-27'6	81'4							S-N & W-E	-6'3	60'9	18'9	103'1	-13'1	118'9	-3'5	76'9								

ENGLAND S.W.:—SCILLY.

Height of Head above—Ground 9'8 m., M.S.L. 49'7 m.
Height of Cups above—Ground 5'8 m., M.S.L. 45'7 m.

ENGLAND E.:—SHOEBURYNESS.*

Height of Head above—Ground 27'4 m., M.S.L. 31'4 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.	Day.	3 h.			9 h.			15 h.			Max. in a Gust.	Time of Gust.				
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.				S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.			
I	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	h	m									
2	2'2	5'4	...	3'1	1'3	...	1'3	...	3'1	...	5'8	...	1'8'1	2	30	1	3'4	...	2'5	1'0	0'7	...	1'8	...	4'3	...	3'8	2'6	22	5
3	...	5'0	5'8	...	2'8	4'2	...	5'8	...	2'4	...	10'4	0	45	2	4'3	...	2'5	2'6	0'5	...	2'8	...	1'1	1'5	12	15	
4	2'1	...	1'4	...	0'7	...	3'5	1'5	...	3'8	...	2'6	...	2'3	2'3	6'9	14	45	3	1'0	...	2'5	1'0	...	1'5	1'5	15	55		
5	...	1'6	...	0'7	...	2'1	...	3'2	...	3'8	...	2'6	...	2'3	2'3	6'9	12	55	4	3'7	...	3'0	...	1'7	...	2'1	2'1	16	55	
6	...	1'5	1'5	...	2'8	...	0'6	...	4'3	1'8	...	8'2	...	18'5	18	55	5	0'8	...	4'2	...	3'0	...	1'0	...	5'1	5'5			
7	...	4'7	4'7	...	0'8	1'9	...	4'3	1'8	...	5'8	...	2'4	...	12'1	22	15	6	0'9	...										

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ .	Remarks.
				A_N	A_E	A_Z		
2	P ie L _n L _e L _n F	h m s 0 59 38 I 2 24 I 27 I 30 I 36 2 18	s	μ	μ	μ	km.	
17	O P _z P _n PR ₁ S L M F	II 28 36 II 41 57 II 42 5 II 45 39 II 53 4 I2 14 I2 15 10 26 I4 15	... ... ... ... ... ... 54 ...	... ... ... ... ... ... ... ...	... ... ... ... ... ... ... ...	... ... ... ... ... ... ... ...	10400	Clearly marked P on vertical record.
17	O P S L M F	20 53 6 21 4 58 21 14 49 21 32 21 42 24 0	... ... ... ... 21 ...	... ... ... ... ... ...	... ... ... ... 40 ...	... ... ... ... ... ...	8600	A sharply marked group of long waves began at 12 h. 15 m. 16 s.
18		5 30 to 5 32	...	...	...	...	...	Slight disturbance, with long waves at 5 h. 41 m.
18	i L F	21 23 43 21 42 22 30	... ... ...	... ... ...	... ... ...	... ... ...		Means for Month $\{ A_N = 1.2 \}$. Normals, 1911-18 $\{ A_N = 1.2 \}$. $T = 4.5$.
21	O P S L M F	II 26 18 II 35 19 II 43 25 II 52 II 52 14 33 I3 30	... ... ... ... ... ...	... ... ... ... 83 ...	... ... ... ... ... ...	... ... ... ... ... ...	6000	
22	e i L F L	3 4 3 3 13 49 3 43 4 30 23 6	... ... 27 ... 22	... ... ... ... ...	... ... ... ... ...	... ... ... ... ...
23	L	8 20 to 9 15	18	...	...	...
27	P? S? L M _e M _n F	0 45 54 0 54 6 I 6 I 16 7 28 I 25 46 20 2 0	... ... ... ... 24 ...	... ... ... 37 ... ...	... ... ... ... ... ...	... ... ... ... ... ...	6700	
30		...	...	...	...	...	...	Large disturbance. Photographic impression of light spot too faint for accurate reading, owing to rapidity of motion.

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	0 h.		6 h.		12 h.		18 h.	
	A_N	T.	A_N	T.	A_N	T.	A_N	T.
1	μ	s	μ	s	μ	s	μ	s
2	1.4	5	1.7	5	0.9	5	0.9	5
3	1.1	4	0.7	5	0.6	4	0.3	4
4	0.9	4	0.8	4	0.7	4	1.0	4
5	1.0	4.5	0.9	5	1.0	4.5	0.9	5
6	2.3	4	1.0	5	2.3	4	1.8	5.5
7	2.5	4	2.0	4	1.8	4.5	1.8	4
8	1.7	5.5	1.1	5	1.5	4.5	1.1	4
9	1.1	4	1.1	4	1.2	4	1.2	4
10	1.1	4	1.2	4	1.0	4.5	1.6	5
11	1.6	6	1.7	5.5	1.7	6	2.1	4.5
12	1.8	6	2.3	5	2.8	6	2.5	5.5
13	2.7	5.5	2.9	6	2.7	6	2.7	6
14	1.8	5.5	2.3	6	1.8	5	2.0	6
15	2.1	5	2.3	6	1.6	6	1.9	5.5
16	1.8	5	1.5	5	1.3	4.5	1.1	4
17	1.1	4	1.0	4	?	?	1.1	4
18	0.9	4.5	1.1	4	1.1	4	1.0	4
19	1.0	4.5	1.1	4	1.1	4	1.1	4
20	1.1	4	1.0	6	0.9	6	1.1	4
21	1.1	4	0.6	4	?	?	0.8	4
22	0.9	4	0.9	4	0.9	4.5	1.1	4
23	0.9	4	0.9	4	0.5	4	0.1	4
24	1.0	4	0.8	4	0.2	4	0.2	4
25	0.2	4	0.2	4	0.3	4	0.3	4
26	0.9	4	1.1	4	1.1	4	1.1	4
27	0.9	6	1.1	4	1.0	5	...	...
28	1.4	4	1.1	5	1.1	4	0.9	4
29	1.1	4	0.9	4	0.5	4	0.2	4
30	0.3	4	0.3	4	?	?	0.3	4.5

EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).

Day.	Times, G.M.T. of		Remarks.
	Commencement.	Max. Phase.	
17	h m ... 13 22		
17	21 14	21 44	Amplitude on trace 3.3 mm.
21	...	11 57	...
22	...	3 51	Very small.
27	...	1 24	Small.
30	7 37	9 13	Amplitude on trace > 17 mm.

10. SOUNDINGS WITH PILOT BALLOONS.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.														Cloud Observations.									
		Geostrophic.		By Anemometer.		At Heights above M.S.L.										Time, G.M.T. h. m.	Type.	Deg. from N. m/s.	Type.	Deg. from N. m/s.					
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.											
ABERDEEN.																									
2	7 30	270	11	260	1·5	300	10·5	310	10·5	300	10·5	...	...	...	...	...	A-Cu.	...	Ci-St.	350	20
9	7 30	?	?	calm		275	6·0	285	8·5	270	10·0	...	...	...	...	...	250	...	...	...	...
10	7 30	225	15	225	1·8	225	4·0	245	6·5	255	7·5	...	...	...	...	8 0	St.	...	...	...	...
19	7 30	270	16	200	1·8	250	13·0	295	13·0	305	16·0	...	...	...	...	...	...	...	...	270	...
ESKDALEMUIR.																									
1	7 5	?	?	360	3·6	10	6·0	40	8·0	50	9·0	50	8·0	...	...	...	A-Cu.	40	7·5	...	...		
2	7 10	?	?	calm		275	4·8	310	8·0	305	8·5	340	8·5	15	12·0	...	St-Cu.	...	...	...	...
8	7 25	225	8	230	3·4	255	4·3	260	6·0	240	6·5	...	...	...	...	...	A-St., St.	225	...	Ci-St.	10 3·0
8	12 45	225	8	225	6·0	240	6·0	245	8·0	245	11·0	...	...	...	...	...	A-Cu.	205	3·0	Ci., Ci-Cu.	200 3·5
9	17 45	280	10	270	9·5	285	6·5	285	12·0	290	13·0	...	...	...	...	...	Cu-Nb.	270	5·0	...	...		
14	16 0	190	13	200	6·5	195	6·5	195	7·5	195	9·5	...	...	...	...	...	Cu-Nb.	180	...	A-Cu.	190
20	17 0	?	?	65	5·0	65	2·6	30	1·9	25	11·5	5	12·0	...	...	...	...	...	...	...	...
21	7 10	?	?	calm		245	5·5	200	3·8	355	2·8	345	9·0	...	...	7 30	...	...	...	...	
21	11 30	?	?	210	5·0	215	3·0	245	2·9	290	4·0	...	...	...	...	...	...	...	...	...	...
22	11 45	?	?	290	9·5	280	4·5	275	11·0	315	6·0	...	...	...	...	...	Cu.	270	...	...	...	
22	17 40	280	8	290	6·5	345	2·8	340	5·5	335	7·5	...	...	...	...	...	Cu., A-Cu.	360	...	Ci., Ci-St.	270
24	17 40	340	8	290	5·0	300	7·0	330	8·5	340	8·5	...	...	...	...	...	A-Cu.	360	...	...	...	
30	7 15	?	?	250	2·0	325	6·0	350	4·5	330	10·0	...	...	...	...	...	St.-Cu.	315	...	A-Cu.	340 5·0
30	17 40	280	8	290	12·5	300	7·0	300	10·0	310	8·0	315	12·0	320	14·5	...	A-St.	335	...	Ci-St.	315				
S. FARNBOROUGH.																									
1	9 35	?	?	?	?	20	1·2	65	1·7	155	1·8	...	...	...	...	...	Fr-Cu.	...	...	...	...
3	6 55	?	?	290	3·0	295	8·0	300	5·0	...	...	...	...	...	...	...	St-Cu.	...	...	...	...
5	6 30	?	?	275	2·5	305	6·0	300	7·0	20	4·2	35	7·5	25	9·0	...	...	...	...	cloud less	...
12	9 15	260	12	250	7·0	270	12·5	270	19·5	275	14·0	255	22·0	...	...	...	St-Cu.	...	...	Ci.	...
17	6 30	300	12	265	4·0	330	8·0	335	7·0	340	14·5	335	18·5	...	...	...	...	...	...	...	...
19	6 35	?	?	25	3·0	55	5·0	65	5·0	35	4·2	...	...	...	...	...	A-Cu.	...	...	...	...
21	6 30	45	11	25	5·0	55	10·5	50	11·0	45	13·0	35	17·5	15	13·0	...	Cu.	...	...	...	...
22	6 30	?	?	?	?	70	4·4	50	6·5	40	9·5	...	...	...	...	...	...	...	...	Ci.	90
22	6 50	?	?	?	?	70	3·9	50	6·5	40	9·5	...	...	...	...	...	...	...	...	Ci.	...
23	6 25	?	?	?	?	10	5·0	10	6·5	5	10·0	20	14·0	...	...	...	...	...	...	Ci.	360
24	6 45	360	6	?	?	300	4·5	350	3·0	325	5·5	...	...	...	...	...	St-Cu.	...	...	...	...
25	6 25	320	9	?	?	325	15·5	325	10·0	330	8·0	345	10·5	350	15·5	...	...	...	...	cloud less	...
28	9 20	30	32	360	10·0	10	11·0	35	12·5	25	16·5	25	15·5	...	...	...	Fr-Cu.	...	...	Ci.	...
CAHIRCIVEEN.																									
1	7 35	360	10	10	10·0	10	16·5	5	8·5	15	21·0	...	...	...	...	...	Cu., St-Cu.	360	...	A-St., A-Cu.	360
2	7 55	?	?	calm		?	?	35	10·0	45	6·0	45	13·5	...	...	...	...	...	...	Ci-Cu.	45
2	12 35	?	?	360	2·4	15	3·6	45	3·4	40	4·8	35	9·0	30	15·0	...	Cu.	360	...	Ci-Cu., Ci-St.	45				
7	16 50	?	?	255	5·5	280	7·0	275	11·5	265	10·5	250	9·0	220	15·5	...	Cu., St.	270	...	A-Cu. (17-35)	190 5·0				
8	16 35	270	11	260	5·0	270	9·5	285	9·5	275	9·5	280	8·5	...	...	...	Cu., St-Cu.	270	...	...	...	
12	17 5	280	13	?	?	255	9·5	260	13·5	265	19·5	...	...	...	...	...	Cu.	270	...	...	...	
13	8 5	260	17	275	1·0	270	12·0	265	14·0	270	17·5	...	...	...	...	...	Cu.	270	...	A-Cu.	270
16	12 40	330	10	325	7·5	320	15·5	320	9·0	310	10·0	...	...	...	...	...	Cu.	315	...	...	...	
19	16 45	45	6	360	6·5	60	2·7	55	4·8	30	3·2	310	4·0	265	3·6	...	Cu.	25	...	Ci-Cu.	225				
21	7 35	?	?	75	4·5	150	8·5	145	6·0	70	2·8	360	2·3	355	3·0	...	Cu.	25	...	Ci-St.	360				
22	12 20	?	?	330	3·4	220	4·1	105	5·5	215	2·2	105	1·4	50	1·5	...	Cu.	...	...	...	...
23	7 25	360	7	calm		5	2·0	320	5·0	310	7·0	310	8·5	...	...	...	...	...	...	cloud less	...
(For observations at lower levels, see above.)																									
5	6 30																				cloud less				
(For observations at lower levels, see above.)																									
7	16 50																								
19	16 45																								
21	7 35																								
22	12 20																								
22	12 20																								

Height of Station above M.S.L.=H.,
Anemometer above ground= h.

Aberdeen 14 m. 32 m.

Eskdalemuir 242 m. 15 m.

S. Farnborough (Golf Course) 70 m. 31 m.

(Preststock Tower) 89 m. 46 m.

Cahirciveen 9 m. 13 m.

Notes on Pressure Distribution.

April 1919.

1 7 h. Shallow Low over England, High over the Faroe.

2 7 h., 13 h. Wedge extending from the Azores to the British Isles, Low centred near Bodö.

3 7 h. " England S., shallow Low over the North Sea.

5 7 h. " British Isles; deep depression centred near Bodö.

7 18 h., 13 h., 18 h. " the Channel, Low S. of

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN. Taken at 13 h. G.M.T.

Day.	Type of Cloud.	Velocity-height-ratio.				Remarks.	
		Degrees from N.	Milliradians per Second.	Components.			
				W.-E.	S.-N.		
1 13 h.	St-Cu.	58	mr/s.	mr/s.	mr/s.	Fused sheet of St.-Cu.	
2 7 h.	Ci, to Ci-Cu.	350	6°0	- 5°1	- 3°2	Ci. changing to Ci-St. and Ci-Cu.	
,, 13 h.	St-Cu.	328	2°0	+ 0°3	- 2°0	Fused sheet of heavy St-Cu.	
,, 18 h.	St-Cu.	328	4°2	+ 2°2	- 3°6		
4 7 h.	Ci, to Ci-Cu.	319	6°1	+ 3°2	- 5°2		
,, 13 h.	St-Cu.	311	2°8	+ 1°8	- 2°1	Ci. to Ci-Cu. ⊕ visible.	
,, 18 h.	St-Cu.	300	7°1	+ 5°3	- 4°8	St-Cu. in lenticular bands.	
5 7 h.	A-Cu.	300	4°6	+ 4°0	- 2°3	Heavy lenticular St-Cu.	
,, 13 h.	Cu.	295	3°1	+ 2°7	- 1°5	A-Cu. rather indefinite, measurement approximate.	
,, 18 h.	St-Cu.	290	20°0	+ 18°2	- 8°4	Cu. in large masses, obviously low altitude.	
7 13 h.	St-Cu.	271	12°0	+ 11°3	- 4°1	Cu. to St-Cu., transitional type.	
,, 18 h.	St-Cu.	210	2°0	+ 2°0	0°0		
8 13 h.	Cu.	240	1°8	+ 0°9	+ 1°6	Heavy St-Cu.	
,, 18 h.	Cu.	215	3°2	+ 1°8	+ 0°9		
9 13 h.	Cu, to Cu-Nb.	270	3°6	+ 3°6	+ 2°6	Heavy Cu. to Cu-Nb.	
,, 18 h.	Cu-Nb.	280	8°2	+ 8°0	0°0	Basal part measured.	
11 12 h.	St-Cu.	265	9°0	+ 9°0	+ 0°8	St-Cu. of low altitude.	
,, 18 h.	Ci-Cu.	265	3°7	+ 3°7	+ 0°3		
12 13 h.	Cu.	265	4°2	+ 4°2	+ 0°4		
,, 18 h.	Cu.	266	3°4	+ 3°4	+ 0°2		
13 7 h.	False Ci.	272	4°0	+ 4°0	- 0°1	Heavy sheet of "false" Ci.	
,, 13 h.	False Ci.	274	4°0	+ 4°0	- 0°3	Cloud diffuse and indefinite, measurement approximate.	
,, 18 h.	False Ci.	260	1°9	+ 1°9	+ 0°3		
14 7 h.	St-Cuf.	175	10°0	- 0°9	+ 10°0	Average velocity given.	
16 13 h.	Cu-Nb.	352	4°3	+ 0°6	- 4°3		
,, 18 h.	Cu-Nb.	338	16°0	+ 6°0	- 14°8	Apical part measured. It had the form of St-Cu.	
17 13 h.	St-Cu.	291	3°9	+ 3°6	- 1°4		
18 7 h.	False Ci.	278	2°7	+ 2°7	- 0°4	False Ci. becoming A-Cu.	
,, 13 h.	A-Cu.	261	3°3	+ 3°3	+ 0°5	A-Cu. in lenticular sheets.	
,, 18 h.	St-Cu.	259	3°1	+ 3°1	+ 0°5	Lenticular St-Cu.	
20 13 h.	Cu.	340	5°0	+ 1°7	- 4°7		
21 13 h.	Ci-Cu.	295	2°8	+ 2°5	- 1°2	Cu. to St-Cu., transitional type.	
23 13 h.	Cu.	306	8°2	+ 6°6	- 4°8	Flat, fused Ci-Cu.	
,, 18 h.	St-Cu.	315	8°2	+ 5°8	- 5°8	Cu. changing to small Cu-Nb.	
24 13 h.	Cu.	305	5°0	+ 4°1	- 2°9		
26 13 h.	Cu-Nb.	344	13°0	+ 3°6	- 12°5		

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Aurora Observations.		Remarks.	
			Eskdalemuir.	Richmond.	Station.			
7	...	○	...	...	Baltasound	...	
8	p.	...	2, I	I, I	Deerness			
15	...	○	...	...	Aberdeen	...	Faint glow, 22 h.
20	p.	...	I, I	I, I	Paisley			
23	...	○	...	...	Tenbury	...	21 h.
29	p.	...	I, I	I, o	Oxford	...		
30	...	●	...	...		

Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at midnight of the night in question.

METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—*Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.*

Ninth Year.—No. 5. MAY 1919.]

Units based on the C.G.S. System.

[Price 1s.

1. SUNSHINE AND SOLAR RADIATION.

Day.	WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.						RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.						ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.						CAHIRCIVEEN.	
	Bright Sunshine.*		Radiation received on Horizontal Surface by Callendar Radiograph.						Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.				Bright Sunshine.*		Radiation by Ångström Pyrheliometer.				Bright Sunshine.*	
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.		For Day.	11.30 h. to 12.30 h.	Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	p sec Z.	p ₀	Intensity	Total.	Per cent. of Possible.
					Amount.	mw/cm ² .	h. m.	mw/cm ² .	hr.	%	...	...	...	hr.	%	h. m.	...	...	...	hr.	%
1	1.0	7	963	28	66	12 48	52	0.1	1	...	...	...	...	2.9	19	...	...	...	...	0.0	0
2	0.0	0	n 413	12	36	11 55	36	0.0	0	...	...	...	...	9.7	64	...	...	...	...	5.4	36
3	4.2	28	1250	35	72	13 50	55	4.7	32	...	...	...	...	6.5	42	...	...	...	...	0.1	1
4	1.3	9	945	27	61	12 50	45	3.3	22	...	...	...	...	0.0	0	...	...	...	...	0.0	0
5	0.2	1	594	17	53	13 32	25	1.6	11	...	...	...	...	0.1	1	...	...	...	...	4.0	26
6	5.0	33	1397	39	68	11 42	68	0.1	1	...	...	...	...	0.0	0	...	...	...	...	12.8	85
7	0.0	0	631	17	49	13 45	25	0.8	5	...	...	...	...	5.2	33	...	...	...	...	14.1	93
8	6.2	41	1252	34	60	10 59	58	6.5	43	...	...	...	...	0.5	3	...	...	...	...	7.7	51
9	12.6	83	1985	54	69	12 0	69	12.0	79	...	...	...	...	9.9	63	...	...	...	...	0.0	0
10	6.2	41	1472	40	80	13 40	64	6.7	44	...	...	...	...	8.2	52	...	...	...	...	3.0	20
11	7.7	50	1711	46	79	11 37	79	3.9	25	...	...	...	...	2.9	18	...	...	...	...	5.3	34
12	1.9	12	861	23	65	14 55	16	2.5	16	...	...	...	...	0.3	2	...	...	...	...	0.8	5
13	12.5	81	1770	47	74	12 45	73	12.0	78	...	...	...	...	8.9	56	...	...	...	...	1.5	10
14	13.0	84	2054	55	68	12 45	67	12.9	83	...	...	...	...	13.4	84	...	...	...	...	2.3	15
15	10.8	70	1568	42	62	13 25	55	10.6	68	...	...	...	...	12.8	80	...	...	...	...	2.6	17
16	5.0	32	1259	33	62	10 15	61	4.7	30	...	...	...	...	6.2	39	...	...	...	...	1.2	8
17	11.8	76	2106	55	82	12 0	82	12.3	79	...	...	...	...	4.2	26	...	...	...	...	1.2	8
18	6.0	38	1548	40	68	12 35	60	6.6	42	...	...	...	...	3.7	23	...	...	...	...	7.0	45
19	3.8	24	2222	58	74	12 12	74	14.2	90	...	...	...	...	13.8	85	...	...	...	...	5.3	34
20	11.4	73	2310	60	x 86	12 7	x 86	11.3	72	...	...	...	...	10.9	66	...	...	...	...	2.0	13
21	12.7	80	x 2334	60	77	12 15	77	11.3	72	...	...	...	...	2.2	14	...	...	...	...	6.3	40
22	11.9	75	2168	56	81	12 10	81	11.6	73	...	...	...	...	11.9	72	...	...	...	...	9.7	62
23	13.0	82	2206	56	76	13 1	74	12.7	80	...	...	...	...	10.4	63	...	...	...	...	0.0	0
24	4.1	26	1482	38	73	10 35	68	6.1	38	...	...	...	...	3.4	21	...	...	...	...	3.9	24
25	1.5	9	913	23	54	16 0	22	0.6	4	...	...	...	...	6.2	37	...	...	...	...	0.0	0
26	6.1	38	1641	42	63	12 20	63	8.3	52	...	...	...	...	11.3	68	...	...	...	...	11.5	71
27	11.4	71	2046	52	74	11 35	74	10.6	66	...	...	...	...	13.3	80	...	...	...	...	6.2	39
28	11.9	74	2045	51	68	13 5	66	12.2	76	...	...	...	...	13.2	79	...	...	...	...	8.1	50
29	13.5	84	2081	52	69	11 28	69	13.5	84	...	...	...	...	11.0	65	...	...	...	...	4.3	27
30	12.5	77	2224	56	73	12 10	73	12.8	79	...	...	...	...	11.9	70	...	...	...	...	9.0	56
31	12.9	80	2042	51	68	12 33	67	12.6	78	...	...	...	...	7.7	46	...	...	...	...	13.9	85
Means	7.48	48	1597	42	68	—	61	7.71	50	—	—	—	—	7.19	45	—	—	—	—	4.81	31	
Normal	5.61	36	1478	39	—	—	—	6.48	42	—	—	—	—	5.23	33	—	—	—	—	6.55	42	
	35 years →		7 years →		35 years →		35 years →		35 years →		35 years →		35 years →		35 years →		35 years →		35 years →			

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9.1 m. H_b = 13.7 m. H_a = 26.4 m. Above Ground: h_t = 1.3 m. h_r = 0.56 m. h_a = 13.9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.		Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0-10) and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.		Horizontal Force, Declination West, and Inclination.				
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	mm.	200+	a.	...					
	mb.	mb.	200+	200+	200+	200+	millibar.	%	m/s.	m/s.	Tenths of Sky covered.	mm.	200+	...					
1	1013.2	1004.7	83.4	83.7	n 85	83	11.9	12.1	95	95	250	10	230	13	2.4	82	d. n. and a. Damp day.		
2	1002.7	1005.5	82.3	81.9	n 85	81	9.7	9.3	83	82	315	4	265	8	3.6	81	• n. o. a. Fine p.		
3	1005.0	1003.2	83.9	83.2	n 85	80	10.2	11.4	79	92	225	2	150	2	10	10.0	x 16.5	Fine n. o. a. • p.	
4	1003.6	1004.2	84.9	83.3	86	83	12.4	11.4	90	92	185	10	165	10	10	10.0	82	d. n. • a. o. day. • later.	
5	1000.7	1008.9	83.5	81.7	n 85	81	11.7	8.5	93	76	160	10	235	10	7	12.8	82	• n. p. a. p. day. Fair p.	
6	1017.3	1020.5	85.0	81.5	86	78	10.2	8.7	73	79	255	4	—	1	2	5	—	79	Fine day. ⊕ p.
7	1021.2	1021.0	83.8	82.9	n 76	76	8.5	9.3	66	77	50	5	90	2	2	2	—	n 72	Fine and ⊙ n. Very fine day. [∞ p.
8	1019.5	1016.3	85.4	83.2	87	78	8.7	10.3	61	84	75	3	73	5	—	—	74	Fine and ⊙ n. Fine and ∞ a. o. and ⊙ o. to c. and ∞ early. • a. o. and ∞ o. and ∞ n. Fair and ∞ all day. [day.	
9	1009.8	1002.9	83.0	84.8	87	80	9.3	12.3	76	90	100	6	100	8	100	4.8	75	68° 42'	
10	1004.9	1003.8	84.5	84.5	87	83	11.0	11.2	81	83	150	6	155	10	800	—	80	o. and ∞ n. Fair and ∞ all day. [day.	
11	1001.3	1008.3	84.9	84.8	88	83	12.1	12.6	88	92	185	5	170	5	8	10	9.0	82	Fair n. • a. Fair day. Dull p.
12	1008.0	1011.0	85.5	85.5	88	84	13.7	13.1	95	91	160	10	170	10	10	3.0	84	d. o. to a. o. q. and p. evening.	
13	1014.6	1011.9	85.7	87.9	90	84	13.6	13.9	98	83	155	7	110	8	10	1.5	84	p. n. and a. Fair day. ⊕ d. o. p.	
14	1005.7	1007.5	89.5	85.4	90	85	15.8	13.6	85	95	220	3	175	3	6	4.2	85	• early. Fair a. Dull evening.	
15	1010.0	1013.3	83.9	83.8</td															

3. METEOROLOGY:—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28'$ N. Long. $0^{\circ} 19'$ W.Heights above Mean Sea Level:—Rain-gauge Site, H = 5.5 m. Barometer, H_b = 10.4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.			
			Vapour Pressure.		Percentage.													
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.						
1	mb.	mb.	a.	a.	a.	a.	millibar.	%	%	° m/s.	m/s.	10●	10	x 6.0	77	● early. Dull to o. Cloudy later.		
2	1004.8	1004.9	83.8	83.6	86	81	11° 3	10° 5	88	281	4	236	4	2.0	82	● at intervals 8 h.—13 h. Dull and o.		
3	998.3	1003.2	84.0	82.2	86	81	12° 2	9° 0	94	225	6	281	2	—	75	● p. noon. Fair to fine.		
4	1008.4	1010.7	83.5	83.9	88	80	9° 3	8° 9	74	69	3	214	2	7	81	● between 3 h. and 4 h. ● d. 9 h. Dull to fine.		
5	1012.5	1017.0	85.2	84.4	91	82	12° 4	11° 6	88	87	4	214	2	100	9	≡ early. ≡ 7 h.—9 h. Dull a. Fine to o. p.		
6	1016.9	1015.0	85.1	83.8	92	82	11° 5	8° 0	82	62	—	101	5	100	75	[∞] 18 h.		
7	1014.6	1015.2	83.7	84.8	89	83	10° 9	10° 5	85	76	90	2	90	2	100	Dull to fair. Sunshine about noon.		
8	1018.0	1020.0	83.0	82.3	n 85	80	9° 8	8° 9	80	76	68	5	56	3	100	Dull to 13 h., then fine. o. later.		
9	1019.5	1016.7	82.1	84.2	91	80	9° 9	10° 0	86	76	23	3	90	4	? 000	Dull to 10 h. Fine. ∞ all day. [∞] 20 h. 30 m.		
10	1013.5	1009.8	88.0	87.9	93	80	10° 8	11° 4	64	68	56	4	90	5	? 000	≡ early. Fine and 000 13 h. 30 m. Line q. 21 h. 30 m.		
11	1009.6	1012.1	88.7	87.7	93	83	13° 1	12° 8	74	77	180	4	191	2	8	0.1	● o. h. 25 m.—35 m. Fine to fair. < 20 h. 15 m. and 30 m.	
12	1015.0	1017.6	86.8	86.8	93	81	13° 4	13° 1	86	84	—	0	214	5	300	10	≡ early. 000 ² to 9 h. 30 m. Fine to o. ●	
13	1021.1	1023.9	87.7	88.0	93	x 85	13° 6	13° 0	82	77	191	4	236	2	10	0.1	● d. early. Dull to fine. [d. 17 h.—18 h.]	
14	1024.9	1020.9	91.0	88.8	96	81	12° 7	11° 9	62	67	191	3	90	3	3	74	≡ early. Fine.	
15	1016.7	1012.8	92.1	89.0	96	x 85	14° 0	12° 3	64	68	79	6	90	5	200	Fine all day.		
16	1011.3	1013.9	92.1	89.4	x 98	x 85	13° 2	14° 1	60	76	101	2	270	2	? 000	∞ early. Fine to fair.		
17	1015.4	1014.5	87.2	89.5	94	x 85	13° 5	13° 2	84	71	—	1	281	2	10	81	o. to 14 h. Fine later.	
18	1014.8	1013.9	88.2	86.5	93	83	11° 8	9° 7	69	63	236	2	—	3	0	Fine all day. V. in p.		
19	1014.6	1016.6	87.1	83.9	89	81	9° 5	9° 4	59	73	338	3	68	5	2	Fine in a. to cloudy at 17 h. o.		
20	1018.9	1022.0	86.0	83.9	89	81	7° 7	8° 5	52	66	79	8	90	6	? 000	∞ early. Fine all day.		
21	1023.9	1023.2	88.2	85.3	92	80	7° 9	8° 8	46	62	146	6	90	6	3	Fine all day.		
22	1022.4	1020.9	90.2	88.0	95	82	8° 7	10° 5	n 45	62	135	6	90	5	2	75	Fine all day. ⊕ 13 h.	
23	1020.9	1023.8	90.9	88.9	95	84	10° 5	9° 6	52	54	79	6	79	3	1000	o. 8 h.—9 h. 30 m. Fine rest of day. ∞ in a.		
24	1025.8	1026.5	91.0	89.1	x 98	81	11° 7	13° 8	57	76	180	2	214	3	000	≡ early. Fine and warm all day.		
25	1026.1	1023.7	89.1	89.4	95	84	11° 6	14° 5	64	78	259	2	—	1	900	Fine to fair all day, with ∞. ⊕ 18 h.		
26	1022.9	1022.2	88.9	88.2	93	84	12° 5	14° 4	70	84	326	2	11	3	10	o. early. o. and showery later. — 17 h. 45 m.		
27	1026.1	1027.2	85.2	84.5	91	81	10° 7	10° 5	76	78	45	4	90	2	? 7	81	o. early. Fair to fine, with ∞ rest of day.	
28	1026.6	1024.4	86.1	84.8	91	80	10° 1	8° 5	67	62	79	5	113	2	? 000	≡ early and o. Fine from 7 h. 30 m. ∞ all		
29	1023.4	1021.0	87.9	85.5	93	n 78	9° 4	8° 1	56	56	113	2	113	2	000	≡ early. Fine, cloudless, and ∞ all day. [day.]		
30	1016.0	1014.0	87.7	86.1	93	84	10° 8	9° 9	65	66	101	4	90	6	000	— 80		
31	1014.3	1016.2	89.8	89.6	97	83	12° 7	11° 4	67	61	79	4	90	3	? 000	≡ early. Fine and cloudless, with ∞ all day.		
Means	1017.3	1017.4	87.4	86.4	92.4	81.9	11° 3	10° 8	70	71	3.6	3.3	5.3	4.5	9.2	77.4*	Monthly Totals or Means.	
Normal	1015.0	1015.0	85.0	84.2	89.3	80.1	10° 1	10° 3	71	75	4.2	2.9	—	—	43.8	—	Normals.	

4. METEOROLOGY:—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19'$ N. Long. $3^{\circ} 12'$ W.Heights above Mean Sea Level:—Rain-gauge Site, H = 242 m. Barometer, H_b = 237.3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Vane of Anemometer, H_a = 15 m.

Day.	REMARKS.																		
	REMARKS.																		
	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.							
1	975.5	967.4	79.6	77.5	84	77	6.9	6.8	71	81	280	6	260	9	10●	1.8	73	• ⁰ early. ⊕ o. q. a. c. p. ⁰ p. • ⁰ n.	
2	968.6	971.6	78.9	75.0	83	n 73	5.9	6.3	64	90	290	8	210	3	3	6	1.4	69	o. i. h. b. △ a. b. c. Δ ⁰ p. p. • ⁰ n.
3	974.6	979.7	77.7	75.4	83	n 73	6.9	6.4	81	88	250	4	—	0	6	9	4.0	n 71	W ² . c. ▲●. p. to c. y. a. and p. o. to b. n.
4	980.1	983.4	79.5	81.7	83	75	9.1	10.0	83	89	120	6	190	6	100	2.8	72	d. ⁰ a. and p. p. ≡ to o. n.	
5	987.5	984.9	84.0	84.7	87	79	9.1	10.9	70	80	130	3	130	9	10●	4.1	76	o. g. ∞ a. and p. ≡ to ● ⁰ n.	
6	988.8	992.6	80.3	79.0	82	78	9.6	8.8	94	95	180	4	70	4	100	≡ ² early. o. ≡ ⁰ p. ● ⁰ n.			
7	996.3	995.8	79.8	77.5	83	76	8.5	7.7	86	91	50	7	50	5	10	0.9	74	b. c. to o. p. a. • ⁰ to o. p. o. n.	
8	995.4	993.2	79.0	76.9	n 80	77	7.5	7.4	81	92	60	5	50	5	10	1.5	77	o. a. • ⁰ 12 h.—17 h. d. ⁰ to o. n.	
9	991.2	988.3	81.1	79.1	87	75	9.0	9.0	84	96	40	6	20	3	9 ⁰⁰	—	74	≡ ⁰ early. o. ≡ ⁰ to b. ∞ a. and p. p. ⊕ n.	
10	984.8	983.3	82.8	85.7	93	77	9.2	8.8	76	88	30	6	—	1	8	4.0	75	≡ ⁰ early. c. to o. a. b. c. ∞ p. K ² to b. n.	
11	984.2	984.0	84.8	82.2	91	81	10.7	11.1	78	96	—	1	200	8	100	5.6	80	o. ≡ ⁰ to c. ∞ a. • ⁰ T q. p. • ⁰ n.	
12	989.3	991.6	82.4	82.4	89	80	10.9	11.4	93	97	210	7	210	11	100	3.5	80	≡ early. o. ∞ a. ≡ ⁰ to p. and n.	
13	994.6	993.9	85.0	83.1	92	82	11.5	9.7	83	79	200	7	360	21	9 ⁰⁰	—	83	≡ early. c. to b. c. y. ⊕ a. and p. b. n.	
14	991.4	988.5	90.7	86.3	95	x 83	11.5	11.1	57	73	140	7	70	4	900	—	83	• early. o. to c. a. o. u. • ⁰ p. o. ≡ ⁰ n.	
15	987.0	987.7	86.5	95	81	11.5	11.0	69	71	40	6	—	1	300	—	76	W ² h. Very fine. y. ∞ a. and p. b. c. n.		
16	988.0	987.7	89.4	82.9	90	80	11.1	10.6	60	88	140	2	—	1	000	—	77	• ⁰ ≡ ⁰ early. c. to o. ∞ a. and p. o. n.	
17	985.5	985.3	85.3	83.9	91	81	10.6	10.3	75	80	50	4	—	0	500	—	80	o. ≡ ⁰ early. c. a. o. u. to o. p. p. o. n.	
18	988.0	991.6	84.6	80.0	88	79	9.9	8.8	73	88	120	3	—	1	8	9 ⁰⁰	—	78	• early. o. to c. a. o. u. • ⁰ p. o. ≡ ⁰ n.

5. GEOPHYSICS :—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.						Magnetic Character of Day.	Electric Character of Day.	Charge per cc. $\times 10^{16}$.	Air-Earth Current $\times 10^{16}$.	Potential Gradient, Volts per metre. Factor 2.27.				
					Horizontal Comp't.		Declination.		Inclination.										
	0.3 m.	1.2 m.	Daily Mean.	Extremes.	Mean Time.		Mean Time.	West.	Mean Time.	North.	+	-	About 15 h.	About 15 h.	3 h.	9 h.	15 h.	21 h.	
1	a.	a.	cm.	cm.	h m	γ	h m	°	h m	°	I	I	Coulomb.	Amp/cm ² .	v/m.	v/m.	v/m.	v/m.	
2	200+	200+	313	...	11 8	18412	14 19	14 47'9	...	...	2	I	0.60	0.65	0.70	225	255	225	280
3	80.0	80.7	317	...	...	...	...	...	...	...	2	I	...	...	...	—	310	310	560
4	81.1	80.7	320	...	...	...	...	...	...	...	2	O	...	...	...	310	280	170	295
5	81.1	80.7	324	...	...	...	...	...	...	...	1	O	0.39	0.30	0.45	310	125	100	225
6	82.3	80.6	324	325	...	...	...	...	...	...	1	O	0.62	0.41	1.05	395	395	420	365
7	83.0	80.9	323	...	...	...	...	...	...	...	0	O	0.26	0.34	0.95	225	420	490	560
8	83.2	81.0	318	...	11 12	18415	14 22	14 46'8	14 46	66 57'5	0	O	0.39	0.00	0.60	225	490	405	490
9	83.0	81.1	314	...	...	...	...	...	...	...	0	I	0.97	0.88	1.50	335	660	560	535
10	83.5	81.3	311	...	...	...	...	...	...	...	0	I	...	...	...	310	210	155	365
11	84.5	81.4	307	...	...	...	...	...	...	...	0	O	...	...	...	255	225	280	155
12	85.0	81.6	304	...	...	...	...	...	...	...	0	O	0.80	0.30	1.00	140	185	195	—
13	85.7	81.8	300	...	...	...	...	...	...	...	2	O	0.37	0.24	0.50	—	—	195	—
14	85.4	81.9	298	...	...	...	...	...	...	...	1	O	0.45	0.13	1.85	—	—	535	380
15	86.2	82.0	299	...	...	...	...	...	...	...	1	O	0.45	0.15	0.95	335	405	125	110
16	87.0	82.1	294	...	11 13	18387	14 21	14 47'7	14 33	66 58'4	1	O	0.24	0.17	1.20	85	100	185	125
17	87.5	82.3	292	...	...	...	...	...	...	...	1	O	...	...	...	155	240	140	225
18	87.2	82.8	290	...	...	...	...	...	...	...	1	O	...	...	...	140	210	255	335
19	86.8	83.0	285	...	...	...	...	...	...	...	1	O	0.67	0.58	1.65	280	550	480	450
20	86.3	83.2	283	...	...	...	...	...	...	...	1	O	0.45	0.30	0.90	280	185	155	520
21	86.6	83.5	281	...	...	...	...	...	...	...	2	O	1.25	0.60	1.10	295	210	140	450
22	86.8	83.6	279	...	11 4	18400	14 19	14 46'9	14 36	66 57'1	1	O	0.67	0.24	1.40	255	730	365	420
23	86.9	83.7	278	...	...	...	...	...	...	...	1	O	1.14	1.03	0.40	280	70	210	—
24	87.5	83.8	271	...	...	...	...	...	...	...	2	O	...	...	...	155	185	155	55
25	87.7	83.8	270	...	...	...	...	...	...	...	1	I	...	...	85	125	140	170	
26	87.4	83.9	268	...	...	...	...	...	...	...	1	O	0.71	0.32	1.20	210	450	435	295
27	87.1	84.2	266	...	...	...	...	...	...	...	1	O	0.58	0.43	1.35	225	350	395	240
28	86.9	84.0	264	...	...	...	...	...	...	...	0	O	0.52	0.19	1.05	395	505	490	480
29	86.9	84.1	263	...	...	...	14 18	14 50'1	...	...	0	O	...	0.69	1.30	255	395	420	560
30	87.1	84.2	262	...	11 6	18406	...	...	14 34	66 55'6	0	O	0.47	0.32	1.50	365	535	630	520
31	87.2	84.3	261	...	...	...	...	...	...	...	0	O	...	...	...	255	435	405	265
M.	85.4	82.5	292	—	—	—	—	—	—	—	—	—	—	—	—	242*	342*	307*	353*
	85.1	83.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Mean of 27 days only.

6. GEOPHYSICS :—ESKDALEMUIR.

Day.	North Component.			West Component.			Vertical Component.			Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 6.05.			
	Maximum. 16000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	Maximum. 44000 γ +.	Minimum. 44000 γ +.	Range.			3 h.	9 h.	15 h.	21 h.
	h m	γ	h m	h m	γ	h m	h m	γ	h m	h m	h m	v/m.	v/m.	v/m.	v/m.
1	22 58	1076	957	11 27	119	23 1	929	868	7 7	61	21 30	1083	1059	12 50	24
2	17 9	1110	893	12 26	217	14 11	1014	789	3 53	225	17 3	1267	939	3 39	328
3	21 13	1085	765	9 5	320	21 19	982	693	3 20	289	16 40	1131	<830	>301	2
4	20 8	1025	935	11 47	90	16 35	934	832	21 13	102	17 55	1121	1064	0 0	57
5	18 17	1032	909	11 5	123	14 10	924	804	3 32	120	20 5	1112	983	3 21	129
6	19 0	1033	928	13 8	105	14 57	909	851	0 30	58	19 40	1102	1029	0 0	73
7	20 8	1018	943	13 58	75	18 7	907	850	6 38	57	21 25	1095	1062	11 10	33
8	19 11	1019	959	13 50	60	17 5	910	850	8 3	60	19 45	1084	1052	12 5	32
9	19 18	1041	951	12 4	90	13 46	925	849	6 14	76	21 20	1083	1059	11 33	24
10	19 8	1028	951	11 37	77	15 6	929	866	0 0	63	17 41	1093	1057	11 27	36
11	22 50	1020	962	10 56	58	13 7	913	866	8 0	47	4 35	1083	1058	11 25	25
12	22 14	1027	957	11 23	70	12 43	944	857	7 26	87	17 55	1101	1051	11 37	50
13	17 40	1117	889	5 3	228	15 30	901	801	20 41	160	18 10	1122	959	5 29	163
14	19 25	1050	889	10 3	161	12 54	936	789	1 25	147	18 31	1111	949	1 27	162
15	19 10	1041	929	13 33	112	15 53	918	840	9 23	78	19 12	1095	1014	1 41	81
16	20 13	1045	911	12 48	134	14 13	932	834	6 15	98	17 20	1091	1050	3 45	41
17	18 20	1065	900	23 32	165	14 20	950	828	22 45	122	19 58	1139	1030	23 42	109
18	0 17	1039	894	9 52	145	13 18	930	821	0 13	109	17 50	1095	1038	3 25	57
19	16 44	1038	933	11 39	105	14 45	946	836	6 55	110	17 40	1121	1061	11 17	60
20	20 19	1069	936	12 0	133	14 45	925	801	4 32	124	20 13	1107	1042	4 20	65
21	17 47	1160	938	19 37	222	19 28	1009	817	6 37	192	17 57	1168	1044	11 10	124
22	1 48	1106	894	23 31	212	13 50	925	814	22 59	111	20 25	1099	975	23 48	124
23	16 6	1025	920	13 41	105	12 46	918	853	7 20	65	16 37	1118	990	0 0	128
24	16 27	1176	914	9 9	262	16 30	983	824	22 0	159	16 36	1216	1018	5 8	198
25	16 6	1037	903	0 17	134	16 8	946	819	8 3	127</td					

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. 49° 12' N. Long. 2° 6' W.

Heights above M. S. L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1.48 m. h_r = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.						Min. Temp. on Grass.	Percentage of Humidity.				Rain 0 h. to 24 h.	REMARKS.
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.	Mean of 5 Readings.		9 h.†	14 h.	21 h.	Mean.		
1	1006.1	1007.0	1007.8	1006.9	83.7	83.6	82.7	84.6	81.5	82.7	78.7	86	92	91	90	5.0	• ² 3 h. till 8 h. • ² 16 h.
2	1002.3	1001.6	1002.3	1003.1	83.0	84.2	82.5	84.5	81.9	83.2	81.9	100	94	97	97	0.9	• ² 4 h.-6 h. and 19 h. 40 m.
3	1005.9	1005.7	1007.1	1006.2	83.4	83.5	83.0	n 83.9	81.5	83.1	78.7	91	96	98	95	2.9	• ² 9 h. \equiv noon; very thick at 17 h.
4	1010.3	1011.3	1011.3	1011.0	84.3	85.3	86.1	88.0	82.6	85.3	82.5	95	82	87	88	0.5	• ² 4 h.
5	1009.8	1008.3	1008.7	1008.9	86.1	85.2	91.9	83.1	87.3	76.9	82	55	74	70	—	—	—
6	1009.4	1009.0	1008.9	1009.1	84.2	85.7	83.1	86.2	82.0	84.2	81.4	90	75	95	87	0.8	• ² 2 h. 30 m.
7	1009.3	1008.9	1010.2	1009.5	84.0	90.0	83.8	90.0	81.9	85.9	79.0	82	59	82	74	—	—
8	1009.9	1008.1	1007.1	1008.4	83.3	88.0	85.5	90.5	82.0	85.9	81.3	88	56	73	72	0.4	• ² 4 h. 30 m.-5 h. 30 m.
9	1003.3	1001.8	1001.9	1002.3	88.4	93.4	86.8	94.1	84.1	89.4	81.0	65	48	84	66	—	—
10	1003.7	1004.9	1006.5	1005.0	84.9	89.8	86.1	90.6	84.0	87.1	82.9	100	70	89	86	3.7	• ² 0 h.-9 h. 30 m. Ground steaming [11 h.]
11	1010.3	1012.5	1012.5	1012.4	86.3	85.2	84.8	87.9	85.5	85.5	77.5	86	88	91	88	2.8	• ² 12 h. 50 m., 23 h. 30 m.
12	1017.7	1018.5	1018.2	1018.1	86.3	93.1	89.1	93.9	84.0	89.2	84.2	87	57	68	71	—	—
13	1016.6	1013.8	1011.0	1013.8	92.6	95.1	88.7	95.1	86.3	91.6	81.4	57	52	81	63	—	—
14	1005.5	1003.1	1004.2	1004.3	93.9	98.7	88.4	x 99.5	x 86.4	93.4	83.6	58	50	92	67	x 8.4	R in the West 17 h. 15 m. • ² 17 h. 35 m. [R] • 18 h.-23 h.
15	1008.3	1010.7	1011.3	1010.1	85.0	85.7	83.4	87.6	83.8	85.1	84.5	88	79	95	87	—	• ² 4 h.
16	1013.0	1012.3	1011.3	1012.2	86.0	88.1	83.5	89.1	82.9	85.9	79.9	71	68	90	76	—	—
17	1011.2	1011.0	1010.9	1011.0	86.0	89.7	83.5	90.0	82.8	86.4	76.0	86	55	83	75	—	—
18	1010.3	1010.2	1010.2	1010.2	85.8	87.1	83.4	88.6	81.1	85.2	74.3	76	71	90	79	—	—
19	1010.5	1010.9	1011.9	1011.1	87.2	89.3	85.1	90.4	n 80.0	86.2	n 73.4	54	62	82	66	—	—
20	1014.7	1014.0	1013.8	1014.2	88.2	93.0	85.7	93.3	84.6	89.0	79.9	49	40	72	54	—	—
21	1013.4	1011.8	1011.1	1012.1	90.1	93.5	87.4	94.1	85.2	90.1	80.4	42	n 32	67	47	—	⊕ 7 h. and 14 h.
22	1012.9	1015.3	1018.5	1015.6	85.4	87.6	83.7	89.3	83.0	85.8	78.5	79	74	91	81	—	Red sky 4 h. • ⁰ 9 h. 50 m. Clouds slow and \equiv^0 4 h. [vaporous 21 h.]
23	1022.3	1022.7	1023.9	1023.0	84.9	88.5	83.7	89.3	82.0	85.7	76.7	88	69	96	84	—	—
24	1022.3	1021.8	1020.6	1021.6	87.4	89.3	84.4	90.5	82.8	86.9	74.9	74	57	89	73	—	⊕ 4 h.-5 h. ⊕ 7 h.
25	1018.9	1018.5	1018.3	1018.6	89.8	90.3	84.2	91.6	81.8	87.5	74.7	58	67	96	74	—	⊕ 11 h. and 19 h. 30 m.
26	1018.6	1018.9	1018.9	1018.8	90.1	88.1	84.5	90.6	83.4	87.4	76.9	79	79	78	79	—	—
27	1017.4	1016.2	1015.7	1016.4	86.0	87.7	84.8	89.3	83.0	86.2	80.4	79	77	86	81	—	⊕ 18 h. (only the left parhelion).
28	1015.3	1013.4	1012.7	1013.8	88.1	90.7	85.1	91.5	82.9	86.3	79.4	66	57	83	69	—	Sky somewhat veiled all day.
29	1009.5	1007.3	1006.7	1007.8	89.5	93.6	87.1	94.0	83.9	86.6	81.3	69	53	77	66	—	Threatening sky 18 h.
30	1004.7	1005.6	1005.3	1005.2	91.0	95.8	87.8	95.5	85.9	91.2	83.1	68	50	81	66	—	—
31	1007.5	1009.0	1010.9	1009.1	88.6	92.0	86.7	93.0	85.6	89.2	83.2	89	66	89	81	4.8	R (distant) 3 h. • ² till 5 h. 30 m.
Means	1011.3	1011.1	1011.3	1011.2	86.9	89.6	85.1	90.6	83.2	87.1	79.6	77	66	85	76	30.2	—
Normal	1010.1	1009.8	1010.1	1010.0	85.7	87.6	83.9	88.7	82.0	85.6	79.0	?	66	82	—	41.3	—
	← 26 years	→ 26 years			← 26 years	→ 26 years			← 23 years	→ 23 years	← 24 years	→ 24 years		← 26 years	→ 26 years		5.3

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).			Mean of Force.	Sunshine.		Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.												Mean Amount.		
					Total.	Per cent. of Possible.	Upper.		Lower.		Upper.		Lower.		Upper.		Lower.				
	9 h.†	14 h.	21 h.		Type.	Direction.	Type.	Direction.	Type.	Direction.	Type.	Direction.	Type.	Direction.	Type.	Direction.	Type.	Direction.			
1	293	4	293	4	270	5	4.3	0.0	0	10	...	...	Nb.	WNW	10	...	...	...	10.0
2	247	6	247	5	270	4	5.0	0.1	5	10	...	...	Nb.	W	10	...	...	...	10.0
3	247	3	180	1	247	4	2.7	0.0	0	10	...	...	Cu.-Nb.	WSW	10	...	...	...	10.0
4	247	3	180	2	90	2	2.3	2.2	9	10	...	...	Cu.-Nb.	WSW	10	A.-Cu.	SSW	...	9.0
5	203	2	180	2	360	2	2.0	12.1	82	3	A.-Cu.	SSE	Cu.	S	1	...	...	...	4.7
6	360	3	360	4	23	3	3.3	3.1	21	7	A.-Cu.	...	...	...	6	...	Cu.-Nb.	NE	6.3
7	67	4	45	4	67	5	4.3	7.3	49	6	A.-Cu.	S	...	...	6	A.-Cu.	SE	...	7.3
8	67	5	67	5	67	5	5.0	11.8	79	5	Ci.	SW	Cu.-Nb.	SE	3	A.-Cu.	SE	...	5.0		
9	90	3	135	2	—	0	1.7	9.4	63	9	...	...	...	2	Ci.	SSE	...	...	6.3
10	247	2	225	2	225	4	3.0	0.3	2	7	A.-Cu.	SW	Cu.-Nb.	WSW	10	...	Nb.	...	5.7		
11	203	2	225	3	225	4	3.0	0.3	2	7	A.-Cu.	...	...	...	1	...	...	...	9.0
12	203	3	225	3	113	2	2.7	7.9	52	10	...	...	...	1	...	A.-Cu.	S	...	5.0
13	113	3	67	3	90	4	3.3	15.2	100	2	A.-Cu.	...	...	...	4	Ci.	SW	...	3.0
14	90	4	135	3	270	4	3.7	11.9	78	4	Ci.-Cu.	SE	...	...	3	Ci.	S	...	5.7
15	270	4	270	3	293	3	3.3	3.9	25	10	...	...	...	10	...	...	...	8.7	
16	247	3	203	3	90	1	2.3	10.8	71	7	A.-Cu.	...	Cu.-Nb.	W	2	...	Fr.-Cu.	NW	4.0		
17	247	2	293	3	337	1	2.0	9.5	62	9	St.-Cu.	W	2	A.-Cu.	WSW	6.0	
18	—	0	45	1	1	0.3	2.0	13	10	Nb.	S	8	A.-Cu.	...	8.7	
19	67	2	90	4	67	4	3.3	15.2	99	0	6	Ci.	NW	Ci.-A.-Cu.	...	2.3
20	135	3	180	1	67	3	1.3	15.2	99	3	A.-Cu.</td										

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 8·8 m., Ground 13·7 m., M.S.L. 19·2 m.
Height of Cups above—Roof 4·6 m., Ground 7·6 m., M.S.L. 15·2 m.

Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.				
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.						
	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	h m				
1	...	10·8	1·6	8·0	...	4·7	...	5·3	...	7·9	...	18·1	23	55						
2	...	4·2	0·8	...	4·5	1·9	...	1·1	...	5·5	...	2·9	...	16·0	1	30						
3	2·6	6·4	1·5	7·7	...	5·2	...	3·4	...	4·3	...	11·2	5	5						
4	2·3	...	2·3	6·8	...	4·6	7·3	...	3·0	...	5·7	...	2·4	...	13·6	13	0					
5	4·9	6·5	...	1·3	6·2	6·1	...	1·2	...	11·6	12	15						
6	4·5	...	0·9	...	2·0	...	3·0	...	1·3	0·9	...	2·9	...	0·6	8·0	2	10					
7	...	4·4	...	4·4	...	4·0	...	9·7	...	6·9	...	2·9	...	3·7	...	5·5	14·7	8	5			
8	3·8	...	5·7	...	3·3	...	3·3	...	5·5	...	3·7	...	3·3	...	3·3	9·7	0	15				
9	...	3·1	...	7·6	...	1·9	...	9·3	...	4·2	...	6·2	...	1·7	...	8·7	14·2	11	30			
10	...	1·5	...	7·4	0·9	...	2·1	1·8	...	2·7	...	5·5	...	1·1	...	10·9	4	25				
11	4·0	...	1·6	...	6·0	...	4·0	7·7	...	1·5	...	7·7	...	1·5	...	14·6	11	45				
12	5·8	...	1·2	5·5	...	1·1	7·7	...	1·5	...	7·1	...	1·4	...	15·3	16	40					
13	6·1	...	1·2	...	7·9	...	3·0	...	1·3	...	Calm	...	11·0	1	50							
14	0·5	...	2·6	...	1·3	6·5	2·4	5·7	...	2·9	...	6·9	12·7	14	5					
15	...	4·3	6·5	...	1·3	4·3	...	1·8	...	4·0	...	1·6	...	12·0	8	15						
16	3·8	...	0·8	...	5·1	...	1·0	4·0	...	1·6	...	0·6	...	3·2	9·4	7	0					
17	1·6	...	4·0	6·2	...	6·4	2·6	6·1	...	1·2	...	1·3	9	14	25							
18	4·8	...	1·0	...	5·6	...	1·9	1·3	...	0·6	...	1·5	...	9·5	0	5						
19	1·0	...	5·1	0·9	...	4·5	...	0·9	1·3	...	3·1	...	4·7	8·5	6	20						
20	1·9	...	4·5	6·2	...	4·2	6·1	...	1·2	2·2	...	1·4	...	12·9	13	25						
21	2·8	...	1·1	2·6	...	3·8	2·6	...	3·8	...	0·4	...	9·8	11	10							
22	...	Calm	...	Calm	...	2·3	2·3	...	Calm	...	7·6	...	11·0	12	55							
23	2·9	...	0·6	3·7	...	3·7	5·7	...	3·8	...	4·8	...	1·0	23								
24	5·8	...	1·2	6·2	...	4·9	...	3·3	4·9	...	3·3	...	11·4	9	35							
25	5·2	...	2·1	...	Calm	...	2·9	0·6	...	1·6	0·3	...	9·4	3	40							
26	...	Calm	...	Calm	...	4·2	0·8	...	Calm	...	6·0	...	12·35	26								
27	...	Calm	...	3·5	0·7	...	1·9	1·3	...	1·3	0·9	...	5·5	8	50							
28	0·3	...	1·6	Calm	...	2·3	0·4	...	Calm	...	4·7	...	13	10	28							
29	0·4	...	2·3	Calm	...	4·0	1·6	...	...	4·3	8·5	21	10	29						
30	...	Calm	...	4·3	...	2·9	2·2	...	3·2	8·7	12	45	30									
31	0·3	...	1·6	1·7	...	3·6	2·4	...	Calm	...	7·2	...	17	30	31							
S+N & W+E	78·5	83·1	101·9	82·8	127·3	76·0	92·5	73·6						S+N & W+E	106·9	111·2	135·8	143·3	141·8	157·1	126·2	125·0
S-N & W-E	43·9	-28·3	65·3	-16·8	38·7	23·0	53·3	-12·0						S-N & W-E	102·1	-66·0	129·8	-77·9	115·2	-106·9	109·2	-101·2

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1·5 m., Ground 4·9 m., M.S.L. 57·3 m.

Day.	3 h.				9 h.				15 h.				21 h.				Vel. in Max. Hourly Run.	Time of Max.		
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.				
	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	hrs.		
1	I	2·5	...	6·1	...	8·8	...	3·6	...	5·3	...	5·3	...	5·8	...	5·8	...	9·5	9	
2	2	...	...	4·3	...	...	...	5·9	...	5·6	...	2·1	...	2·1	...	2·1	...	7·9	8, 9
3	3	3·5	...	3·5	...	2·3	...	5·5	...	4·8	...	2·0	...	5·1	...	1·0	...	6·9	10	
4	4	2·3	...	0·4	...	4·2	...	6·2	...	5·8	...	8·7	...	6·8	...	4·6	...	13·1	17	
5	5	6·8	...	4·6	...	4·6	...	7·6	...	5·1	...	10·1	...	7·1	...	10·6	...	13·4	18	
6	6	7·8	...	...	11·7	8·6	...	...	12·8	9·3	...	9·3	7·3	...	...	10·9	...	15·8	II
7	7	6·4	...	...	9·6	4·5	...	10·9	3·9	...	9·4	2·6	...	6·4	...	4·9	...	13·1	2
8	8	6·6	...	1·0	...	5·1	...	1·4	...	7·2	0·8	...	4·2	...	8·2	...	12·2	12
9	9	1·0	...	2·4	...	2·4	...	3·3	...	3·3	...	2·8	...	2·8	...	3·0	...	4·9	14, 17, 19	
10	10	1·4	...	2·2	...	1·8	...	1·8	...	1·8	...	1·8	...	4·3	5·3	4·2	...	7·5	15	
11	11	3·5	...	3·5	4·9	...	4·9	...	4·9	5·4	...	8·1	6·0	...	9·0	...	11·8	20		
12	12	5·6	...	3·5	...	3·5	...	3·5	...	3·5	...	2·8	...	2·8	...	4·9	...	6·9	20	
13	13	2·9	...	1·4	...	1·4	...	1·4	...	1·4	...	1·4	...	1·4	...	1·4	...	1·4	19	
14	14	...	...	1·2	...	1·2	...	1·2	...	1·2	...	1·2	...	1·2	...	1·2	...	1·2	11
15	15	5·3	...	5·3	...	5·3	...	5·3	...	5·3	...	5·3	...	5·3	...	5·3	...	5·3	15	
16	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S+N & W+E	88·8	144·1	115·2	152·6	115·0	141·2	85·6	133·7						S+N & W+E	58·1	96·3	41·6	110·2	63·8</td	

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ .	Remarks.
				A_N	A_E	A_Z		
1		h m s	s	μ	μ	μ	km.	
		1 20	...	...	...	...	...
1	O	5 5 23	...	...	...	...	8450	
P	5 17 7	...	...	...	...	...
S	5 26 48	...	...	...	...	...
L	5 42 30	...	...	...	...	...
L _n	5 52 57	15	17	...	...	...
F	6 50	...	...	...	...	...
e	2 27 10	...	...	...	...	...
i	2 48 44	22	...	...	...	...
L	3 20 30	...	...	...	...	...
M	3 30 7	20	18	...	...	...
O	0 52 1	...	...	...	...	...	9000	
P	1 4 14	...	...	...	...	...
PR ₁	1 7 38	...	...	...	...	...
S	1 14 23	...	...	...	...	...
SR ₁	1 19 30	...	...	...	...	...
L	1 31	...	...	...	...	...
M	1 43 30	22	102	...	...	...
F	...	...	...	...	...	...
e _c	23 24 6	...	...	...	...	...
e _n	23 37 35	...	...	...	...	...
L	0 55	20	...	...	...	...
F	...	...	...	...	...	...
5	6 1 to	...	...	...	...	...
5	6 14	...	...	...	...	...
5	6 44 to	...	...	...	...	...
16	55	...	...	...	...	...
5	19 14 to	...	...	...	...	...
19	30	...	...	...	...	...
5	20 35 to	...	...	...	...	...
6	20 42	...	...	...	...	...
6	4 50 to	...	...	...	...	...
6	6 30	...	...	...	...	...
6	e _c 19 55 41	...	...	...	...	...
en	19 59 22	...	...	...	...	...
en	20 2 24	...	...	...	...	...
e _e	20 2 32	...	...	...	...	...
L	20 11	...	...	...	...	...
F	24	...	...	...	...	...
7	P 5 34 42	...	...	...	...	...
L	6 13	...	...	...	...	...
M _n	6 32 9	21	8	...	...	...
M _e	6 36 21	20	6	...	...	...
F	8 5	...	...	...	...	...
8	10 48 to	...	...	...	...	...
	12 27	...	...	...	...	...
10	18 15 to	...	...	...	...	...
18	18 47	...	...	...	...	...
18	10 53 to	...	...	...	...	...
18	11 16	...	...	...	...	...
23	23 11 to	...	...	...	...	...
23	23 31	...	...	...	...	...
18	4 44 to	...	...	...	...	...
20	5 18	...	...	...	...	...
i _n	4 40 42	...	...	...	...	...
e _n	4 45 14	...	...	...	...	...
L	4 54	...	...	...	...	...
L _n	5 0	18	...	...	...	...
L _e	5 0	18	...	...	...	...
F	5 20	...	...	...	...	...
22	e _n 12 3 38	...	...	...	...	...
e _e	12 9 10	...	...	...	...	...
e _n	12 9 14	...	...	...	...	...
e _e	12 13 41	...	...	...	...	...
i _n	12 13 43	...	...	...	...	...
L	12 31	...	...	...	...	...
F	13 28	...	...	...	...	...
23	o o to	...	...	...	...	...
	o 40	...	...	...	...	...
23	3 31 to	...	...	...	...	...
	4 30	...	...	...	...	...
23	e _n 6 20 50	...	...	...	...	...
e _e	6 30 18	...	...	...	...	...
L	6 39	...	...	...	...	...
L _n	6 44	25	26	...	...	...
F	7 37	...	...	...	...	...
27	10 50 to	...	...	...	...	...
	11 10	...	...	...	...	...
P?	17 38 20	...	...	...	...	...
S?	17 47 28	...	...	...	...	...
L	18 2	...	...	...	...	...
F	18 54	...	...	...	...	...
29	11 30 to	...	...	...	...	...
	12 30	...	...	...	...	...

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	o h.		6 h.		12 h.		18 h.	
	A_{N}	T.	A_{N}	T.	A_{N}	T.	A _N	T.
1	μ	s	μ	s	μ	s	μ	s
2	1'1	4	?	?	1'6	6	2'3	6
2	2'3	6	1'5	6	1'5	5	1'1	4
3	1'2	4'5	1'1	4	0'9	5	1'0	4'5
4	1'1	4	1'0	4'5	1'0	4	1'1	4
5	1'1	4	1'1	4	1'0	4'5	1'1	4
6	1'1	4	1'1	4	1'1	4	1'1	4
7	1'8	4	1'6	4	1'1	4	1'0	4
8	1'1	3	0'7	3	0'3	3	0'1	4
9	0'3	3	0'3	3	0'1	3	0'1	4
10	0'1	3	0'1	4	0'4	5'5	0'0	4
11	0'3	3	0'5	4	...	...	0'7	5
12	1'0	4'5	1'1	4	0'9	4	0'8	5
13	1'1	4	1'0	4'5	1'1	4	0'8	4'5
14	1'1	4	1'1	4	1'1	4	0'5	4
15	0'9	4	0'9	4	0'1	4	0'5	4
16	0'2	4	...	...	0'5	4	0'3	4
17	0'3	4	0'5	4	0'9	5	0'9	4
18	1'3	3'5	0'9	4	1'1	3	0'6	4
19	0'3	3'5	0'3	3	0'3	3	0'3	4
20	0'3	4	0'9	4	1'0	4	1'0	4'5
21	1'1	4	0'9	5	0'9	5	0'8	6
22	0'8	6	1'0	4'5	1'1	4	0'7	4
23	0'9	4	1'0	4	1'0	4	0'9	4
24	0'9	5	...	...	1'1	4	0'5	5
25	0'6	4	0'5	4	0'9	4	0'3	4
26	0'3	4	0'2	4	0'1	4	0'1	3
27	0'1	4	0'1	3	0'1	4	0'3	4
28	0'3	3'5	0'3	4	0'2	4	0'2	4
29	0'2	4	0'1	4	?	?	0'1	3
30	0'2	4	0'1	4	0'2	4	0'1	4
31	0'0	0	0'0	0	0'0	0	0'0	0

EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).			
Day.	Times, G.M.T. of		Remarks.
	Commencement.	Max. Phase.	
1	h m	h m	Small.
2	...	3 37	
3	...	1 45	Amplitude on trace > 17 mm.
5	...	20 40	Very small.
6	...	5 39	Very small.
6	20 3	20 52	Amplitude on trace 4'3 mm.
7	...	6 41	Small.
20	...	5 4	Very small.
22	...	12 53	Very small.
27	...	10 54	Very small.
27	...	18 19	Very small.
29	...	11 48	Very small.

Slight disturbance. Initial phases indistinct. Prominent group of long waves beginning 11 h. 38 m.

10. SOUNDINGS WITH PILOT BALLOONS.

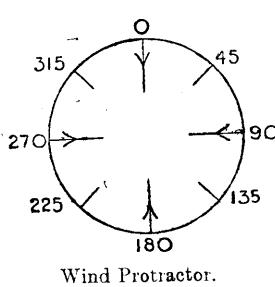
Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.														Cloud Observations.						
		Geostrophic.		By Anemometer.		At Heights above M.S.L.										Time, G.M.T. h. m.		Type.	Deg. from N. mr/s.	Type.	Deg. from N. mr/s.	
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.		Time, G.M.T. h. m.	Type.	Deg. from N. mr/s.	Type.	Deg. from N. mr/s.		
						Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.							
ABERDEEN.																						
2	7 30	280	10	245	4°0	260	11°0	280	16°5	290	8°5	...	...	...	...	13 0	Cu.	275	4°5	...	...
3	7 30	270	7	270	2°5	290	5°5	285	8°0	255	6°5	255	13°5	...	...	13 0	Cu., Cu-Nb.	255	4°0	...	...
24	7 30	225	5	190	2°0	225	6°5	245	7°0	225	11°5	215	18°5	...	...	...	A-Cu.	235	3°0	...	...
27	7 30	?	?	180	2°5	220	7°0	240	6°5	225	3°5	...	...	...	...	...	...	...	...	cloudless	...
28	7 30	?	?	calm		325	2°5	255	2°0	295	6°0	330	9°0	...	...	11 0	A-Cu.	295	3°0	...	...
ESKDALEMUIR.																						
1	7 10	290	9	300	5°0	295	10°5	305	7°0	125	0°9	280	13°5	295	17°0	...	Fr-Cu.	270	...	Ci-St.	...	
2	7 15	315	7	310	4°6	320	4°8	320	6°5	310	11°5	...	...	...	...	...	...	...	...	cloudless	...
13	17 30	?	?	210	6°0	205	7°0	205	8°5	215	6°5	200	9°5	205	13°0	...	...	...	...	Ci.	225 2°5
15	12 10	175	9	100	8°0	125	7°5	150	6°0	155	10°0	155	14°0	...	...	...	A-Cu.	135	1°5	Ci-St.	150 1°5
16	7 20	160	7	80	1°5	110	1°6	160	9°5	145	10°5	140	10°0	...	...	9 30	...	...	...	cloudless	170 6°5
20	7 20	155	34	120	3°2	145	4°9	160	10°0	165	8°5	155	10°5	135	2°6	...	...	...	...	Ci., Ci-Neb.	280 ...
20	12 0	170	24	140	9°0	150	15°0	150	11°5	165	13°5	175	9°0	135	4°0	...	Ci-St.	260	...	Ci.	260 0°5	
20	17 40	170	21	130	4°8	150	7°5	160	10°0	190	8°0	155	3°5	...	...	18 0	A-St.	...	...	Ci-St.	200 ...
21	17 35	180	12	150	4°2	165	9°5	175	12°5	175	15°0	180	14°0	190	7°5	...	A-St., A-Cu.	...	...	Ci.	200 ...
22	7 15	180	7	25	1°4	120	3°5	175	10°0	190	7°5	165	14°0	175	16°5	7 55	...	...	...	Ci., Ci-St.	180 ...
22	12 5	180	6	160	5°0	165	7°5	160	13°0	150	6°0	160	14°0	...	...	...	Cu.	180	...	Ci.	180 ...
22	17 35	180	6	195	3°0	195	4°6	165	7°5	175	9°5	...	...	...	...	17 30	A-St.	230 2°5	...	Ci-St.	200 3°0
23	7 10	?	?	calm		195	4°8	190	9°5	210	10°0	...	...	...	...	...	A-Cu.	225	...	Ci.	200 ...
23	17 35	225	8	180	5°5	220	6°0	210	9°5	210	17°5	215	11°0	...	...	17 25	...	...	...	Ci., Ci-St.	225 ...
26	7 25	?	?	calm		270	2°2	275	5°5	285	6°5	300	8°0	320	10°5	Ci-haze	...
26	11 50	?	?	315	2°0	280	1°1	295	1°9	300	4°8	320	8°0	310	7°0	Ci-haze	...
27	7 15	?	?	calm		200	2°7	205	3°9	190	2°2	210	1°3	5	7°0
27	11 0	?	?	170	2°0	205	1°5	200	2°1	195	2°0	335	3°7	350	5°5
28	11 15	?	?	145	3°5	180	3°5	245	3°1	265	2°5	75	0°4	...	...	...	Cu.	...	...	...	...
30	7 20	?	?	360	0°3	295	0°7	245	0°6	120	4°0
30	12 15	?	?	190	1°0	200	2°0	20	2°7	65	2°7	120	4°6	...	...	...	Cu.	...	...	...	...
31	7 20	?	?	calm		60	2°3	70	3°2	55	4°4	cloudless	...
(For observations at lower levels, see above.)																						
1	7 10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Fr-Cu.	270	...	Ci-St.	...
13	17 30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Ci.	225 2°5	...	...	...
20	12 0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Ci-St.	260	...	Ci.	260 0°5
22	7 15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Ci., Ci-St.	180	...	...	...
26	11 50	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Ci-haze	180 2°5	...	...	...
27	7 15
SOUTH FARNBOROUGH.																						
3	6 35	270	12	270	5°0	275	7°5	275	8°5	265	11°0	...	...	...	...	...	St-Cu.	...	...	Ci.	...
6	7 40	?	?	45	2°5	125	2°5	80	3°4	115	2°5	185	1°3	...	...	...	Nb.	...	...	...	...
9	6 5	130	9	70	7°0	95	10°0	105	7°0	100	5°5	125	5°0	190	6°5	...	...	...	...	Ci.	...
10	6 15	180	9	110	8°0	165	10°0	140	10°5	125	16°0	120	16°5	...	...	...	Fr-Cu., St-Cu.	...	...	...	...
13	6 25	6 25	?	?	170	4°5	180	9°5	225	4°2	230	2°8	190	2°8	215	7°5	Ci.	...
14	6 25	130	15	90	6°0	125	17°5	120	14°5	135	11°5	125	14°0	...	...	...	...	...	...	Ci.	...
15	6 35	?	?	160	3°5	170	6°5	120	8°5	145	8°5	140	14°0	130	15°5	...	...	...	...	Ci.	...
17	6 30	?	?	250	3°0	235	6°5	240	4°1	195	6°5	185	11°0	185	11°0	...	A-Cu.	...	...	Ci.	...
19	6 25	100	9	?	!	85	10°5	85	7°0	65	5°5	85	7°5	...	...	...	...	...	...	cloudless	...
20	6 30	130	22	80	6°0	150	12°5	150	10°5	150	2°7	130	2°7	240	2°3	...	...	...	...	Ci.	...
21	6 25	170	15	110	7°0	150	13°5	145	13°5	165	10°0	175	6°5	160	2°8	...	...	...	...	Ci.	...
22	6 40	135	12	90	4°5	135	8°0	135	8°5	140	10°0	145	14°5	155	15°0	...	...	...	...	Ci., Ci-St.	...
23	6 40	?	?	70	2°0	115	6°5	130	8°5	155	6°5	150	7°5	...	...	...	...	...	...	cloudless	...
24	6 40	?	?	290	3°5	15	6°5	325	3°2	235	2°1	250	2°6	210	2°6	...	...	...	...	...	...
26	2 45	?	?	30	4°0	80	7°5	70	8°5	360	3°0	...	...	...	...	...	St-Cu.	...	...	...	...
26	3 40	?	?	30	3°0	75	7°0	75	6°0	340	3°1	...	...	...	...	...	St-Cu.	...	...	...	...
27	7 40	?	?	90	?	85	12°5	85	13°5	50	7°0	...	...	...	...	...	Fr-St.	...	...	...	...
28	6 55	?	?	90	3°0	90	7°5	85	8°5	65	6°5	45	4°7	10	5°0	...	...	...	...	cloudless	...
29	6 30	?	?	90	3°5	120	6°5	100	8°5	110	8°5	110	9°0	115	8°5	...	...	...	...	cloudless	...
30	7 15	?	?	70	7°5	90	10°5	80	10°5	90	11°5	100	10°5	105	9°5	...	...	...	...	...	...
(For observations at lower levels, see above.)																						
13	6 25	225	7°0	220	5°0	240	6°0	250	7°5	265	8°0	...	...	...	...	...	Ci.	...	...	...	...
15	6 35	125	15°0	140	13°5	...	...	...	...	...	...	...	...	...	...	...	Ci.	...	...	...	...
20	6 30	290	3°2	315	9°5	315	13°0	315	16°5	315	17°0	...	...	...	...	...	Ci.	...	...	...	...
21	6 25	185	5°5	205	6°5	215	9°5	...	...</td												

10. SOUNDINGS WITH PILOT BALLOONS—continued.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.												Cloud Observations.						
		Geostrophic.		By Anemometer.		At Heights above M.S.L.								Time, G.M.T.		Type.		Deg. from m/s.	Type.	Deg. from m/s.
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.		h. m.			N.	N.
CAHIRCIVEEN.																				
3	7 25	270	6	220	2.7	280	5.5	280	8.0	270	16.0	275	25.5	...	...	6.20	St.	270	A-St., A-Cu.	270
6	7 25	270	?	270	4.8	255	6.0	285	6.5	275	10.0	275	7.5	...	...	...	Cu.	270	A-Cu.	280
7	7 25	?	?	55	2.6	50	5.0	30	3.1	45	1.2	305	3.2	15	3.3	...	Cu.	45	...	...
7	17 5	?	?	360	8.0	140	7.0	170	7.0	175	4.9	80	2.1	80	6.0	...	Cu.	90	...	...
8	7 25	90	6	calm		60	7.0	60	5.5	85	3.4	30	3.4	10	2.8	...	St-Cu.	155	A-St.	...
13	16 40	?	?	125	5.5	160	10.0	165	17.5	100	12.0	180	20.5	...	...	8.15	St., St-Cu.	180	A-Cu.	175
14	7 25	?	?	70	10.5	140	12.0	185	6.5	190	13.5	...	...	...	...	...	Fr-St.	155	A-St.	180
16	7 25	?	?	155	10.5	155	17.5	165	14.0	185	15.0	...	...	...	...	...	Fr-St.	155	A-St.	200
19	7 55	170	9	115	12.0	120	15.5	135	22.0	140	20.0	...	...	...	...	...	Cu.	155	Ci-Cu.	155
26	7 55	?	?	calm		150	6.0	155	4.0	190	2.1	...	...	...	...	...	Fr-St.	155	A-Cu.	270
27	7 15	?	?	?	6.5	150	12.0	135	11.0	100	6.0	175	9.0	145	2.6	...	Cu-lent	135	A-St.	270
29	17 5	?	?	?	3.7	110	4.2	145	4.5	175	7.5	130	12.0	...	...	...	St.	155	Ci-St.	90
30	7 20	?	?	75	3.6	100	6.5	130	6.5	105	8.0	125	9.0	135	7.0	...	A-Cu.	90	...	...
30	16 45	?	?	calm		120	5.5	105	5.5	110	7.5	85	5.5	105	7.0	...	St., A-Cu.	...	Ci., Ci-Cu.	135
31	7 20	?	?	calm		50	6.5	60	3.8	75	7.5	75	7.5	85	6.5	...	St., A-Cu.	...	Ci.	135
31	17 20	?	?	250	3.2	20	3.8	50	5.5	70	8.0	...	...	...	...	...	St., A-Cu.	...	cloud	...
				5000 m.		6000 m.		7000 m.		8000 m.		9000 m.		10,000 m.						
7	7 25	(For observations at lower levels, see above.)		330	4.0	290	6.0	285	10.5	280	14.5	255	14.0	...	...	...	Cu.	45	...	...
7	17 5			60	5.5	30	8.0	30	10.0	50	6.0	55	3.4	15	8.5	...	Cu.	90	...	...
8	7 25			350	2.9	310	4.4	295	4.5	270	5.5	275	7.5	285	8.0	...	...	...	cloud	...
27	7 15			140	10.0	...	...	...	...	...	...	...	...	...	...	...	Cu-lent	135	A-St.	135
30	7 20			145	10.5	...	...	...	...	...	...	...	...	...	...	...	St., A-Cu.	...	Ci., Ci-Cu.	135
30	16 45			135	8.0	130	10.0	135	11.0	140	10.5	...	...	...	...	...	St., A-Cu.	...	Ci-Cu.	135
31	7 20			55	5.5	85	10.5	75	11.0	80	11.5	...	...	...	...	...	St., A-Cu.	...	Ci.	...
				11,000 m.		12,000 m.		13,000 m.		14,000 m.		15,000 m.		16,000 m.						
8	7 25			250	4.5	265	3.6	290	2.9	115	2.1	175	5.0	225	3.6	...	...	...	...	cloud
																			less	

Height of Station above M.S.L. = H.,
Anemometer above ground = h.

Aberdeen . . .	14 m.	32 m.
Eskdalemuir . . .	242 m.	15 m.
S. Farnborough . . .	70 m.	31 m.
Falmouth . . .	51 m.	12 m.
Cahirciveen . . .	9 m.	13 m.



Notes on Pressure Distribution.

May 1919.

- 1 7 h. Low centred E. of Iceland with a tongue over the North Sea; High over the Azores.
- 2 7 h. " over the Faroe;
- 3 7 h. " near Iceland;
- 6 7 h., 18 h. High over Scandinavia and the Azores; shallow Low S. of Iceland."
- 8 7 h. " " low over Spain.
- 9 7 h. " " the Bay of Biscay.
- 10 7 h. High over the Arctic region; shallow Low S.-W. of Ireland.
- 13 7 h., 13 h., 18 h. Extensive anticyclone over Europe; Low over Iceland.
- 14 7 h. South-Easterly type.
- 15 7 h., 13 h. Anticyclones over the Baltic and the Azores; shallow Low between Iceland and Ireland.
- 16 7 h. Shallow Low W. of Ireland; High over Scandinavia, light gradient over the British Isles.
- 17 7 h. Low W. of Ireland; High over Scandinavia, light gradient over England.
- 19 7 h.
- 20 7 h., 13 h., 18 h. Anticyclone over the North Sea; shallow Low over the Atlantic.
- 21 7 h., 18 h.
- 23rd to 31st. Anticyclone over the British Isles.

Notes on Ascents.

Aberdeen—

27th, 7 h. 30 m. Misty, cloudless all day

Eskdalemuir—

1st, 7 h. 10 m. Solar halo. Barometer falling unstably.

2nd, 7 h. 15 m. Exceptional visibility.

20th, 7 h. 20 m. Solar halo.

12 h. 0 m. Solar halo.

South Farnborough—

6th, 7 h. 40 m. Drizzle just before ascent.

26th, 2 h. 45 m. Pilot balloon with lantern.

Cahirciveen—

8th, 7 h. 25 m. A haze developing between 7 h. and 9 h.

13th, 16 h. 40 m. Solar halo.

16th, 7 h. 25 m. Sky became more cloudy during ascent.

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN.

Day and Hour G.M.T.	Type of Cloud.	Velocity-height-ratio.				Remarks.	
		Degrees from N.	Milliradians per Second.	Components.			
				W.-E.	S.-N.		
1 7	Ci-Cu.	285	mr/s. 6'2	mr/s. + 6'0	mr/s. - 1'6	Faint Ci-Cu. in curled wisps.	
1 13	Cu.	276	7'6	+ 7'5	- 0'5		
1 18	Fr-Cu.	269	7'4	+ 7'4	+ 0'1		
2 13	Cu	273	4'6	+ 4'6	- 0'2		
2 18	Cu.	249	4'0	+ 3'7	+ 1'4		
3 13	Cu. to Cu-Nb. St-Cu.	253	4'1	+ 3'9	+ 1'1	Cloud changing from Cu. to Cu-Nb., the latter predominant. St-Cu., low altitude, with "thunder-heads" forming. High velocity. Thundershowers evening.	
11 13		166	12'5	- 3'0	+ 12'1		
12 13	False Ci.	254	3'4	+ 3'3	+ 0'9	Cloud sheet was A-St. previously, but now thinned out into "false" Ci.	
15 13	Ci.	170	1'2	- 0'2	+ 1'2	Ci. becoming Ci-St. in occasional patches.	
22 13	Ci.	168	2'0	- 0'4	+ 2'0	Irregular Ci., becoming slight Ci-Cu. in places, faint ⊕.	
23 18	False Ci.	215	2'1	+ 1'2	+ 1'7	False Ci. sheets, becoming A-Cu. later.	
24 7	A-Cu.	235	2'8	+ 2'3	+ 1'6	A-Cu. with cloudlets of greatly varying sizes. Height, 3000 m. by Pilot Balloon.	
24 13	Cu-Nb.	225	4'2	+ 3'0	+ 3'0	Base of cloud measured. ↗ to west, afternoon.	
25 13	St-Cu.	280	3'0	+ 3'0	- 0'5	St-Cu. of low altitude.	
28 11	A-Cu.	295	3'0	+ 2'7	- 1'3	Fine A-Cu. sheets.	

General Note.—Several long spells of fog and stratus cloud occurred, preventing observational work.

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Station.	Aurora Observations.	Remarks.
			Eskdalemuir.	Richmond.			
1	p.	...	2, 2	1, 2	Deerness		
2	p.	...	2, 2	2, 2	Edinburgh		
3	a. p.	...	2, 2	2, 2	Paisley	Brilliant, with streamers, 1 h.	
6		...	2, 1	2, 1	Eskdalemuir		
6	p.	...	I, 0	O, O	Donaghadee		
15	...	D	...	...	Deerness	...	
17	p.	○	...	...	Tenbury	...	
19	p.	...	I, I	I, I	Paisley	White streamers, 21 h. 30 m.—22 h.	
22	...	□	I, I	I, I	Tenbury	Long white streamers, 21 h. 30 m.—22 h.; patches of moving light, 21 h. 30 m.	
26	a.	...	I, I	I, I	Eskdalemuir	Faint glow, 1 h.	

Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at midnight of the night in question.



METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—*Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.*

Ninth Year.—No. 6. JUNE 1919.]

Units based on the C.G.S. System.

[Price 1s.

1. SUNSHINE AND SOLAR RADIATION.

WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.				RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.				ESKDALEMOIR.—Lat. 55° 19' N. Long. 3° 12' W.				CAHIRCIVEEN.					
Day.	Bright Sunshine.*	Radiation received on Horizontal Surface by Callendar Radiograph.				Bright Sunshine.*				Radiation at Noon by Ångström Pyrheliometer.				Bright Sunshine.*				Radiation by Ångström Pyrheliometer.	
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.		Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	$\frac{P}{P_0}$ sec Z.	Intensity.	Total.	Per cent. of Possible.
					For Day.	11.30 h. to 12.30 h.													
					Amount.	Time.													
1	hr. 8·0	% 49	j/cm ² . 1519	% 38	mw/cm ² . 56	h. m. 11 44	mw/cm ² . 56	hr. 6·9	% 43	... 315	— 2	hr. 4·2	% 25	h. m. ...	... 315	... 2	hr. 10·2	% 63
2	4·2	26	1300	32	79	13 20	75	4·8	29	... 345	— 2	9·5	56	... 315	... 305	... 2	13·8	84	
3	5·7	35	1413	35	78	13 25	72	5·2	32	... 305	— 2	6·1	36	... 315	... 305	... 2	13·2	80	
4	0·4	2	570	14	38	7 30	20	0·3	2	... 305	— 2	4·5	26	... 315	... 305	... 2	4·6	28	
5	4·8	29	1444	36	78	13 25	57	5·1	31	... 315	— 2	5·1	30	... 315	... 305	... 2	0·1	1	
6	9·0	55	1703	43	78	10 35	59	8·4	51	... 315	— 2	0·1	1	... 315	... 305	... 2	10·6	4	
7	14·0	85	2436	60	79	12 30	79	14·0	85	... 315	— 2	8·0	47	... 315	... 305	... 2	5·3	32	
8	8·3	51	1933	47	91	12 0	91	7·7	47	... 315	— 2	7·0	41	... 315	... 305	... 2	4·0	24	
9	8·5	52	1930	47	88	12 45	86	8·1	49	... 315	— 2	10·1	59	... 315	... 305	... 2	10·5	63	
10	14·2	86	—	—	—	—	—	14·5	88	... 315	— 2	9·8	57	... 315	... 305	... 2	0·7	4	
11	11·8	72	2074	50	75	13 45	74	11·7	71	... 315	— 2	1·7	10	... 315	... 305	... 2	0·5	3	
12	10·8	65	2055	50	84	11 55	84	10·8	65	... 315	— 2	6·0	35	... 315	... 305	... 2	1·1	7	
13	5·0	30	1252	30	77	14 22	68	5·0	30	... 315	— 2	6·8	39	... 315	... 305	... 2	5·7	34	
14	8·2	50	1557	38	76	12 19	76	9·4	57	... 315	— 2	14·3	83	... 315	... 305	... 2	4·3	26	
15	14·5	88	2502	61	80	12 56	79	13·6	82	... 315	— 2	0·8	5	... 315	... 305	... 2	6·8	41	
16	15·0	91	2566	62	81	11 45	81	14·8	90	... 315	— 2	0·0	0	... 315	... 305	... 2	0·7	4	
17	14·1	85	2455	60	84	12 15	84	12·8	77	... 315	— 2	10·2	59	... 315	... 305	... 2	3·8	23	
18	7·9	48	1767	43	87	10 25	82	9·4	57	... 315	— 2	9·2	53	... 315	... 305	... 2	9·6	57	
19	8·1	49	1898	46	86	12 10	86	7·1	43	... 315	— 2	0·1	1	... 315	... 305	... 2	2·9	17	
20	0·0	0	n 300	7	14	10 30	8	0·0	0	... 315	— 2	5·0	29	... 315	... 305	... 2	6·6	40	
21	11·9	72	2331	57	95	13 22	94	12·2	73	... 315	— 2	7·8	45	... 315	... 305	... 2	13·1	78	
22	10·2	61	1967	48	87	11 5	82	9·7	58	... 315	— 2	1·6	9	... 315	... 305	... 2	0·3	2	
23	5·5	33	1609	39	x 97	12 27	x 97	4·4	27	... 315	— 2	7·5	43	... 315	... 305	... 2	6·2	37	
24	1·6	10	804	20	61	8 50	13	1·5	9	... 315	— 2	7·5	43	... 315	... 305	... 2	0·1	1	
25	1·5	9	1121	27	77	10 15	56	1·7	10	... 315	— 2	6·5	38	... 315	... 305	... 2	4·8	29	
26	3·7	22	1447	35	90	13 40	52	5·6	34	... 315	— 2	11·4	66	... 315	... 305	... 2	3·8	23	
27	0·8	5	1004	24	56	11 12	48	1·0	6	... 315	— 2	5·4	31	... 315	... 305	... 2	2·4	14	
28	4·1	25	1378	34	70	9 20	53	4·2	25	... 315	— 2	4·6	27	... 315	... 305	... 2	0·0	0	
29	6·6	40	1501	37	90	11 26	65	8·0	48	... 315	— 2	9·7	56	... 315	... 305	... 2	8·2	53	
30	2·6	16	992	24	82	13 10	51	2·3	14	... 315	— 2	4·0	23	... 315	... 305	... 2	1·5	9	
Means	7·37	45	1563†	38†	74†	—	64†	7·33	45	—	—	5·90	35	—	—	—	5·17	32	
Normal	5·80	36	1559.	38	—	—	—	6·57	40	—	—	5·43	32	—	—	—	6·27	38	
← 35 years →		7 years		← 35 years →		← 35 years →		← 35 years →		← 35 years →		← 35 years →		← 35 years →		← 35 years →		← 35 years →	

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9·1 m. H_b = 13·7 m. H_a = 26·4 m. Above Ground: h_t = 1·3 m. h_r = 0·56 m. h_a = 13·9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.		Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0–10) and Weather.		Rain 0 h. to 24 h.		Min. Temp. on Grass.		REMARKS.		Magnetism.		
	9 h.		21 h.		9 h.	21 h.	Vapour Pressure.	Percentage.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	Horizontal Force, Declination West, and Inclination.		
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.			
1	mb. 1018·7	mb. 1022·1	a. 89·7	a. 90·9	a. 99·9	a. 85	16·2	15·2	86	75	—	0	—	1	200	82	Fine and ☀ n. Fine and ☀ day.		
2	1025·7	1027·4	90·5	87·4	x 93	85	15·5	13·0	78	80	—	1	315	2	0	6	—	Fine dry day.	
3	1028·1	1027·9	90·2	87·8	91	83	13·1	12·5	67	75	—	0	345	5	2	6	79	Fine and ☀ n. Fine day.	
4	1027·2	1025·2	88·7	86·7	x 86	84	14·4	14·0	83	90	320	3	310	3	9	10	83	Fair n. and day. o. evening.	
5	1022·7	1021·5	86·3	86·7	90	x 86	14·3	13·4	94	86	—	1	315	0	10	10	85	c. to o. n. o. to d ⁰ day.	
6	1018·7	1016·5	89·2	88·1	92	x 86	14·6	14·6	80	86	170	7	170	6	7	10	84	o. n. Fair day. ⊕ p.	
7	1010·2	1014·8	86·4	85·1	89	84	14·4	11·8	94	84	190	3	235	4	10	8	x 11·8	• 0 to • 2 morning. Fair day.	
8	1011·3	1015·3	86·1	84·5	89	83	13·2	10·4	88	77	180	7	255	8	10	7	81	p. n. and morning. Fair day.	
9	1019·9	1025·4	87·8	85·5	89	82	11·9	12·7	71	88	200	6	230	3	6	5	79	Fine n. and morning. Fair day.	
10	1029·1	1022·5	86·4	87·3	89	82	13·0	15·5	85	96	160	5	170	7	10	10	84	o. n. o. to c. day. o. evening.	
11	1018·1	1012·7	87·9	86·4	90	85	16·3	14·7	97	96	170	7	260	2	10	10	87	• 0 to d. n. o. to e. a. o. and • 0 p.	
12	1015·2	1017·8	84·4	85·4	87	83	9·5	12·1	71	85	290	9	280	9	10	10	82	d. n. o. to c. a. o. p.	
13	1024·6	1029·4	85·7	84·8	88	82	10·8	11·7	74	85	320	7	305	2	9				

3. METEOROLOGY:—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28' N.$ Long. $0^{\circ} 19' W.$ Heights above Mean Sea Level:—Rain-gauge Site, $H = 5.5$ m. Barometer, $H_b = 10.4$ m. Cups of Anemometer, $H_a = 25$ m.Heights above Ground:—Thermometers, $h_t = 3.0$ m. Rain-gauge, $h_r = 0.53$ m. Cups of Anemometer, $h_a = 20$ m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.			
			Vapour Pressure.		Percentage.													
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.						
1	mb.	mb.	a.	a.	a.	a.	millibar.	%	%	° m/s.	° m/s.	Tenths of Sky covered.	mm.	200+	Fine. ∞ . T_p .			
2	1017.5	1017.5	91.0	88.7	96	83	14.1	11.0	69	62	—	1	90	3	77	Fine a . ∞ . Dull n .		
3	1021.2	1023.9	87.2	84.6	89	82	9.9	8.3	62	61	34	4	34	5	79	Dull a . Fine p .		
4	1014.6	1023.6	83.5	84.5	88	79	8.2	8.4	65	62	360	3	23	2	74	Fine early. $\bullet a$ and p . $\oplus p$.		
5	1020.5	1016.8	87.4	89.2	90	n 78	11.1	16.1	68	88	281	4	—	1	10 $\equiv 0$	n 71		
6	1016.3	1017.8	90.0	91.9	96	x 89	13.4	13.4	70	62	337	3	337	2	10	85		
7	1020.7	1020.2	91.7	92.9	98	85	14.1	16.8	66	73	315	2	247	2	7	200		
8	1019.6	1017.0	94.5	92.8	99	86	16.0	16.2	63	71	191	4	225	3	0	80		
9	1019.1	1019.3	90.6	89.3	97	87	13.8	12.3	69	67	236	3	225	4	8	83		
10	1022.6	1027.4	91.9	89.5	96	86	14.5	10.5	67	56	225	5	270	2	10	83		
11	1033.3	1031.8	89.8	90.0	97	83	11.2	11.5	59	60	—	1	—	I	—	75		
12	1027.1	1018.7	93.2	92.9	x 110	85	12.9	11.5	55	50	191	4	—	I	800	79		
13	1010.4	1013.2	92.2	87.3	95	87	15.9	10.3	72	64	214	9	214	8	9	82		
14	1016.4	1025.0	86.7	87.0	92	84	10.7	10.0	69	63	259	6	—	I	10	83		
15	1028.3	1025.6	87.9	88.1	96	81	11.0	11.2	66	66	—	I	—	I	7 $\equiv 0$	74		
16	1024.4	1020.9	91.0	87.9	98	80	10.8	9.2	53	55	157	3	—	I	2000	Fine. ∞ a . v. p .		
17	1020.2	1018.7	91.7	90.8	98	80	10.5	10.9	n 49	54	214	4	225	2	I	73		
18	1021.2	1019.5	89.9	91.8	98	83	13.5	13.5	71	63	225	2	259	2	3	77		
19	1021.0	1021.1	91.1	92.4	99	87	13.8	13.4	67	60	247	2	203	2	I	82		
20	1019.4	1015.7	91.3	90.5	95	85	11.2	13.3	54	67	214	5	225	5	4	10		
21	1015.8	1014.2	86.9	85.8	90	85	13.8	13.5	88	92	—	I	293	2	10	85		
22	1019.3	1027.1	86.8	86.8	90	83	9.6	9.4	61	60	281	5	315	2	7	80		
23	1029.5	1022.3	87.6	88.0	94	80	10.2	12.2	62	72	247	3	225	4	2	74		
24	1017.9	1015.8	88.1	84.6	94	85	10.2	10.3	60	76	281	6	281	4	8	84		
25	1017.2	1017.8	85.7	85.4	88	84	9.9	9.7	68	68	304	6	—	I	9	81		
26	1013.8	1015.6	85.1	83.0	88	82	9.6	8.4	68	69	11	3	360	2	9	80		
27	1017.9	1020.2	83.0	83.0	n 87	79	7.7	9.3	63	76	337	5	—	I	7	75		
28	1019.9	1020.0	85.3	86.8	90	79	9.9	13.3	70	85	281	2	—	0	10	72		
29	1019.6	1016.0	91.2	88.9	94	86	13.5	12.7	65	71	259	5	293	3	6	80		
30	1015.5	1014.1	85.8	83.9	89	83	7.9	8.5	54	66	315	5	304	5	9	78		
Means	1019.7	1019.4	88.7	88.1	93.5	83.2	11.6	11.5	65	67	3.8	2.5	2.5	6.7	4.1	30°0	78.5	
Normal	1015.3	1015.3	88.3	87.6	92.8	83.4	12.3	12.5	71	75	3.6	2.7	—	—	55.6	—	Normals.	
	45 years		30 years		35 years		45 years											

4. METEOROLOGY:—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19' N.$ Long. $3^{\circ} 12' W.$ Heights above Mean Sea Level:—Rain-gauge Site, $H = 242$ m. Barometer, $H_b = 237.3$ m. Vane of Anemometer, $H_a = 250$ m.Heights above Ground:—Thermometers, $h_t = 0.9$ m. Rain-gauge, $h_r = 0.38$ m. Vane of Anemometer, $h_a = 15$ m.

I	992.1	994.4	84.2	82.7	91	81	10.7	9.2	81	77	40	6	40	5	10	—	81	REMARKS.		
																		$\equiv 0$ early. o. to c. a. c. to o. g. p. p^0 o. q. n.		
																		\oplus 7 h. c. y. to o. a. o. to b. y. p. b. y. to b. n.		
2	996.5	997.7	84.3	79.9	88	77	7.4	7.7	n 55	77	10	5	360	3	7	o	—	74	\oplus b. to c. y. ∞ a. ∞ y. to o. p. o. p^0 n.	
3	997.7	995.1	84.9	84.9	90	n 74	8.2	11.3	59	82	40	2	310	3	5	9	—	n 71	p^2 3 h. c. to o. p. a. p^2 to b. c. u. p. b. c. $\equiv 0$ n.	
4	990.3	988.8	90.2	86.7	93	x 84	15.4	12.9	79	83	320	10	290	3	7	4	3 $\equiv 3$	82	o. to c. a. c. to o. g. p. o. p. n.	
5	988.5	990.4	90.0	86.7	93	x 84	12.5	12.6	65	81	290	4	270	4	7	10	—	83	Overcast a and p . o. $\equiv 0$ n.	
6	990.8	991.0	87.0	84.8	89	x 84	13.8	12.2	87	89	200	4	210	4	10	9 $\equiv 0$	—	85	\oplus 7 h. o. to c. a. o. to b. y. ∞ to o. p. \oplus \bullet p . $\equiv 0$ \bullet p .	
7	988.2	983.9	89.4	84.4	95	x 84	10.9	13.0	59	97	200	8	200	7	200	10	—	84	$\equiv 0$ early. \bullet b. to c. y. ∞ a. b. y. ∞ to o. p. \oplus \bullet p . $\equiv 0$ \bullet p .	
8	986.5	982.0	85.3	83.9	87	81	9.7	12.0	68	93	210	7	220	13	6	10 \bullet $\equiv 0$	—	80	q. early. b. c. y. a. c. to p. $\equiv 0$ p. \oplus \bullet p . $\equiv 0$ \bullet p .	
9	989.6	994.2	83.0	81.9	86	78	8.3	8.9	68	79	230	8	250	6	6	4	—	76	\oplus 7 h. c. to o. g. p. b. c. $\equiv 0$ p. \bullet \oplus \bullet p .	
10	1001.7	1000.3	85.0	83.4	88	78	9.3	10.8	67	86	240	6	190	3	5	10	—	76	\oplus 7 h. o. to c. a. o. to b. y. ∞ to o. p. \oplus \bullet p .	
11	993.4	989.1	84.9	87.0	89	82	13.3	15.1	95	220	9	—	1	10 $\equiv 0$	4	7.9	—	82	\bullet $\equiv 0$ till 9 h. o. to c. a. o. p. o. to b. c. $\equiv 0$ n.	
12	979.5	975.3	93.1	83.6	x 97	79	17.7	11.0	76	87	50	7	—	0	800	6	4.7	83	\oplus 7 h. o. g. o. to \bullet $\equiv 0$, then c. q. a. b. c. q. p. b. c. to b. n.	
13	982.6	995.7	83.4	82.3	89	76	11.4	9.1	91	78	310	13	300	10	10 $\equiv 0$	1.9	74	\bullet $\equiv 0$ early. ∞ y. p. Fine n.		
14	995.5	995.6	85.8	81.9	90	75	9.1	9.3	62	82	140	2	200	3	3	I	—	72	c. early, then dull all day.	
15	992.0	988.9	85.7	83.7	86	78	10.9	11												

5. GEOPHYSICS :—RICHMOND (KEW OBSERVATORY).

6. GEOPHYSICS :—ESKDALEMUIR.

Day.	Magnetic Force.												Potential Gradient, Volts per metre.* Factor 5.96.					
	North Component.				West Component.				Vertical Component.				Magnetic Character of Day.	Electric Character of Day.	3 h.	9 h.	15 h.	21 h.
	Maximum. 15000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	Maximum. 44000 γ +.	Minimum. 44000 γ +.	Range.									
1	h m γ 21 27 1075	γ 963	h m 14 20 112	γ 14 7 930	γ 835	h m 7 8 95	γ 5 50 1099	γ 1064	h m 11 30 35	γ 1 i	o a	v/m. 215	v/m. 70	v/m. 85	v/m. 65			
2	17 41 1068	971	11 31 97	17 23 942	850	6 50 92	19 6 1106	1070	12 27 36	i	o a	165	70	170	230			
3	17 5 1055	969	12 36 86	17 2 936	846	5 53 90	20 2 1094	1066	12 57 28	o	o a	155	130	215	220			
4	15 58 1042	970	11 2 72	15 59 931	822	7 41 109	4 30 1094	1066	12 6 28	i	i b	215	170	z±	285			
5	16 30 1073	962	11 32 111	16 22 930	858	5 13 72	6 2 1099	1073	11 42 26	i	i b	115	95	115	z±			
6	19 2 1056	984	10 23 72	12 58 926	845	8 30 81	17 44 1108	1062	12 7 46	o	o a	130	70	80	185			
7	18 14 1044	973	11 45 71	13 24 927	844	7 3 83	17 40 1104	1070	12 30 34	o	i b	230	215	115	230			
8	20 48 1040	980	10 52 60	13 25 919	849	7 45 70	5 20 1097	1070	11 58 27	o	i b	155	185	85	-285			
9	15 29 1075	960	16 29 115	15 45 x 973	824	8 20 x 149	16 27 1141	1066	24 0 75	2	i b	130	105	115	145			
10	16 27 1060	n 918	8 33 142	13 33 963	n 814	6 22 x 149	15 42 1131	1020	3 24 III	2	o a	200	105	105	130			
11	18 36 1065	933	10 4 132	16 24 930	n 814	7 5 116	18 5 1124	1049	3 23 75	i	2 b	z±	130	70	165			
12	19 52 1052	937	10 18 115	13 52 939	825	8 37 114	17 30 1113	1015	2 37 98	i	2 c	z±	480	z-	145			
13	18 40 1039	943	10 26 96	13 16 934	825	7 21 109	19 0 1117	1068	1 8 49	i	i b	105	-20	230	185			
14	22 0 1032	958	12 43 74	13 55 934	842	6 3 92	19 5 1109	1080	11 57 29	o	o a	100	130	215	380			
15	19 45 1026	956	10 47 70	13 43 928	839	6 48 89	19 12 1109	1076	11 40 33	o	o a	250	170	100	165			
16	21 8 1032	963	12 52 69	16 17 926	848	7 11 78	18 5 1111	1078	11 0 33	o	i a	120	85	35	70			
17	1 7 1033	960	14 38 73	14 6 927	831	8 4 96	17 40 1117	1072	11 36 45	i	o a	215	180	185	200			
18	20 22 1027	955	10 42 72	3 50 926	856	7 30 70	19 20 1117	1080	4 25 37	o	o a	285	95	70	285			
19	19 42 1029	962	11 56 67	15 37 909	858	9 57 n 51	18 45 1118	1092	11 55 26	o	2 b	150	-1220	345	215			
20	20 1 1031	973	11 58 n 58	15 48 921	857	8 36 64	19 5 1114	1090	12 17 24	o	i b	145	145	115	260			
21	18 4 1044	976	11 16 68	15 27 928	852	7 10 76	19 20 1125	1093	12 50 32	o	2 b	-645	260	150	285			
22	17 9 1056	976	10 55 80	22 24 937	849	8 29 88	18 45 1128	1076	12 25 52	i	2 b	280	z-	85	145			
23	18 30 1065	947	11 45 118	16 26 937	833	6 30 104	20 20 x 1156	1085	3 35 71	i	i a	20	70	80	210			
24	18 0 1077	960	9 37 117	14 33 952	832	2 0 120	18 35 1152	1076	5 0 76	i	i b	95	155	145	-1075			
25	18 31 1112	957	11 45 x 155	18 30 943	823	22 57 120	19 45 1133	1094	12 10 39	i	i b	130	135	95	70			
26	5 52 1033	948	11 22 85	14 3 919	817	i 1 102	16 52 1135	1079	0 41 56	i	i a	215	215	220	145			
27	19 1 1047	949	11 15 98	15 36 944	838	7 17 106	20 20 1122	1104	9 26 18	o	i a	100	150	165	130			
28	18 31 1052	974	9 42 78	14 2 925	837	5 45 88	21 48 1121	1098	11 18 23	o	o a	70	170	130	145			
29	3 45 1037	965	12 24 72	14 4 947	844	0 32 103	17 45 1129	1087	11 26 42	o	i b	105	155	95	230			
30	20 50 1027	963	11 55 64	14 17 933	843	8 8 90	17 25 1126	1095	11 42 31	o	2 b	130	195	-120	130			
M.	—	1050	960	—	90	—	934	838	—	96	—	1118	‡83	‡120	‡118			

x denotes the maximum and n the minimum value in the column. * 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; $z\pm$ Indeterminate in magnitude and sign.

† Mean of 25 days.

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$ Heights above M.S.L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1.48 m. h_r = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.						Min. Temp. on Grass.	Percentage of Humidity.	Rain 0 h. to 24 h.	REMARKS.			Earth Current Character.
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.	Mean of 3 Readings.				9 h.†	14 h.	21 h.	
1	mb.	mb.	mb.	mb.	200+	200+	200+	200+	200+	200+	78°3	78	60	82	73	—	Fair
2	1012.9	1013.3	1013.5	1013.2	89.9	92.6	86.0	93.0	84.5	89.2	75.7	87	66	91	81	—	$\equiv^2 n.$ till 4 h. 30 m.
3	1013.5	1014.6	1016.6	1014.9	86.6	89.3	84.5	90.1	82.5	86.6	78.7	67	57	82	69	—	Fair.
4	1019.3	1019.0	1018.6	1019.0	86.3	87.9	83.2	88.7	82.2	85.7	78.7	67	57	82	69	—	Fair before noon. $\bullet^0 \equiv^0 13$ h. 30 m.
5	1017.9	1016.5	1014.5	1016.3	89.9	90.0	86.5	92.0	n 81.4	88.0	n 74.6	65	55	96	72	—	
6	1013.7	1013.7	1014.6	1014.0	91.4	93.0	86.4	93.9	86.0	90.1	84.5	79	69	92	80	—	
7	1017.5	1017.9	1017.1	1017.5	85.6	87.0	85.6	n 87.9	84.5	86.1	81.0	96	86	95	92	—	$\equiv^2 z$ h. to 10 h. 30 m. \equiv^0 later.
8	1014.8	1013.4	1014.2	1014.1	88.9	98.6	87.9	99.0	83.9	91.8	84.0	79	51	90	73	—	$\equiv^2 o$ h. to 7 h.
9	1015.7	1016.1	1015.1	1016.6	89.0	92.7	86.2	92.6	85.2	89.1	85.9	81	64	88	78	—	
10	1022.1	1022.2	1024.5	1022.6	87.0	90.0	87.7	91.2	85.8	88.3	82.2	90	81	94	88	—	u. 7 h. to 9 h. \bullet^0 9 h. Overcast.
11	1025.2	1027.3	1026.9	1026.8	89.8	94.1	88.9	95.4	86.0	90.8	83.2	82	57	68	69	—	$\equiv^2 n.$ to 6 h. \oplus 14 h.
12	1020.2	1016.5	1011.5	1016.6	94.0	99.4	93.3	101.0	x 87.6	95.1	84.6	56	41	73	57	—	Fair.
13	1012.2	1015.9	1014.9	1014.9	88.3	89.0	86.4	90.2	86.0	88.0	86.2	75	59	75	70	—	$\equiv^2 n.$ \bullet^0 6 h. 20 m.
14	1017.9	1019.9	1021.0	1019.6	86.7	88.1	84.0	90.0	82.9	86.3	84.9	76	65	86	76	—	\bullet^0 7 h. 50 m.
15	1021.7	1020.1	1018.9	1020.2	88.8	91.4	87.0	92.5	83.2	88.4	75.3	60	56	76	64	—	Fine.
16	1017.5	1016.3	1015.8	1016.5	91.9	95.5	88.6	96.8	85.4	91.6	82.0	46	n 37	60	48	—	Fair.
17	1015.7	1015.4	1016.6	1015.9	92.7	92.9	85.6	95.0	83.9	90.0	77.1	48	49	83	60	—	Fine.
18	1017.5	1016.7	1016.9	1017.0	88.0	91.1	85.5	91.5	83.9	88.0	77.2	66	57	86	70	—	
19	1015.1	1014.9	1013.8	1014.6	89.0	93.2	88.0	93.6	83.9	89.5	78.0	80	56	81	72	—	Several black clouds in long, parallel, undulated threads from W. to E. by N. 8 h. 30 m.
20	1012.3	1011.1	1010.9	1011.4	87.9	90.0	86.4	90.4	85.0	87.9	84.8	90	84	98	91	2.3	\bullet shower 10 h. \bullet^2 13 h. 30 m. continuous.
21	1018.5	1020.7	1023.8	1021.0	87.0	89.0	84.5	90.0	83.4	86.8	78.0	66	58	77	67	—	Ci. radiant in S.S.W. 10 h.
22	1024.9	1023.3	1023.9	1023.0	88.9	90.5	85.1	91.4	86.9	88.6	75.6	50	40	82	57	—	\bullet 4 h. 15 m. to 5 h. 40 m.
23	1017.5	1017.8	1016.7	1017.3	88.3	88.0	85.8	90.0	84.5	87.3	78.7	76	57	77	70	—	
24	1018.2	1018.6	1016.5	1017.8	85.9	86.0	84.7	88.5	84.0	85.8	80.1	57	62	75	65	—	
25	1006.1	1005.9	1009.5	1007.2	86.5	85.9	84.5	88.5	83.8	85.8	81.2	98	93	85	92	—	\bullet^2 began 2 h. 30 m.
26	1014.1	1015.1	1016.1	1015.1	86.0	87.0	83.7	88.0	83.2	85.6	77.8	65	56	71	64	—	\bullet^2 shower 6 h. 25 m.
27	1016.7	1017.4	1017.9	1017.3	86.8	87.9	86.6	89.3	82.0	86.5	75.3	69	70	91	77	—	
28	1019.3	1018.9	1017.1	1018.4	87.9	91.5	87.0	92.3	85.3	88.8	82.0	85	68	90	81	—	
29	1014.1	1014.3	1013.3	1013.9	86.9	86.9	85.0	88.9	84.0	86.4	85.9	78	57	75	70	—	\bullet 4 h. 15 m.
30	1011.7	1009.3	1003.7	1008.2	85.2	86.4	84.0	88.3	83.0	85.4	77.3	61	56	97	71	—	\bullet^2 began 16 h.
Means	1016.8	1016.7	1016.4	1016.6	88.4	90.6	86.2	91.8	84.3	88.2	80.2	73	61	83	73	17.7	—
Normal	1011.4	1011.0	1011.1	1011.2	87.6	90.0	86.2	91.2	84.5	87.9	81.4	?	66	83	?	47.2	—

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).				Mean of Force.	Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.												Mean Amount.		
	Wind Direction and Force (0-12 on the Beaufort Scale).		Sunshine.			Upper.		Lower.		Upper.		Lower.		Upper.		Lower.				
	9 h.†	14 h.	21 h.	Total.		Percent. of Poss.	Tenths.	Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.	Tenths.			
1	45	3	360	2	360	2	2.3	15.0	94	2	...	6	Ci.	I	30		
2	45	3	45	4	23	2	3.0	12.8	81	8	...	3	...	...	...	...	60
3	67	3	360	4	23	2	3.0	14.9	94	6	...	1	...	...	...	...	23
4	293	1	337	2	293	2	1.7	6.3	40	2	...	10	...	...	...	...	67
5	337	3	360	3	315	2	2.7	10.9	69	6	A.-Cu.	NNW	...	5	A.-Cu.	NNW	...	43		
6	247	2	225	2	315	1	1.7	1.0	0	10	...	10	...	...	...	...	100
7	180	2	203	2	315	2	2.0	10.3	65	0	...	0	...	...	...	...	10
8	247	2	247	3	247	1	2.0	6.6	41	10	...	4	A.-Cu.	SW	Cu.	W	50			
9	225	3	247	3	270	3	3.0	0.9	5	10	...	10	...	...	...	...	100
10	113	1	225	1	67	4	2.0	9.9	62	10	...	3	Ci.-St.	...	Cu.	...	43			
11	135	2	203	2	67	3	2.3	16.1	100	3	{ A.-Cu.	W	...	0	...	...	10	
12	247	5	270	5	247	5	5.0	11.6	72	3	...	3	Cu.	W	...	...	40	
13	247	4	270	4	293	2	3.3	5.7	35	10	...	10	...	...	...	...	67
14	90	3	23	3	45	4	3.3	14.6	91	0	...	0	...	...	...	...	0.3
15	203	1	203	1	67	3	1.7	16.1	100	0	...	0	...	...	...	...	0.0
16	225	1	315	2	315	1	1.3	16.1	100	0	...	0	...	...	...	...	33
17	293	2	45	2	360	1	1.7	12.0	74	5	Fr.-Cu.	NE	3	Ci.	...	...	57	
18	293	2	247	3	247	1	2.0	8.5	53	8	St.-Cu.	NW	6	Cu.	...	...	43	
19	225	2	247	3	270	2	2.3	8.8	55	4	Ci.	NW	2	Ci.	...	...	100	
20	225	3	203	3	315	4	3.3	0.0	0	10	...	10	...	...	...	...	47
21	270	4	293	4	337	2	3.3	14.2	78	6	Cu.-Nb.	NNW, W	5	...	...	...	23
22	225	3	225	2	293	2	1.5	95	6	3	Ci.	N	...	1	...	...	73	
23	315	3	315	4	315	4	3.7	3.8	23	9	St.-Cu., Cu.-Nb.	NW	9	...	...	...	73
24	315	5	315	4	315	3	4.0	10.9	68	7	A.-Cu.	NE	10	...	...	...	70
25	113	1	45	3	360	3	2.3	0.4	31	10	Nb.</td									

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 88 m., Ground 13·7 m., M.S.L. 19·2 m.
Height of Cups above—Roof 4·6 m., Ground 7·6 m., M.S.L. 15·2 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.					
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.							
1	m/s.	h m																	
2	2·0	...	0·4	...	2·5	1·7	...	4·0	1·6	...	8·0	1·6	...	12·0 22 45					
3	5·7	2·4	...	...	4·5	0·9	...	3·6	...	...	11·5	0 55	...	...			
4	4·9	...	...	...	4·5	1·9	...	3·5	0·7	...	Calm	9·8	6 10	...		
5	2·2	...	3·2	...	1·3	6·5	...	2·1	5·2	...	2·8	2·8	...	14·8 20 15					
6	3·7	3·7	...	...	2·3	5·5	...	1·0	2·4	...	2·4	3·6	...	10·5 0 55			
7	2·4	...	7·7	...	1·5	7·1	...	1·4	...	4·0	17·0	12 50	...	...			
8	4·5	...	6·1	...	2·5	8·8	...	3·6	...	6·0	16·8	21 15	...	...			
9	0·9	...	4·5	...	3·8	5·7	...	8·2	...	3·4	15·4	15 10	...	...			
10	1·3	3·0	...	3·3	...	1·4	4·7	...	3·1	...	2·6	9·8	23 35	...					
11	6·9	2·9	...	4·0	1·6	4·8	...	2·0	2·3	...	1·4	13·3	16 15	...					
12	1·3	...	3·0	5·6	...	6·5	...	1·3	...	6·3	15·2	22·5	21 45	...					
13	5·9	14·2	...	6·6	9·8	...	1·3	6·8	...	Calm	21·0	6 0	...	...			
14	Calm	...	...	Calm	...	...	3·2	...	2·2	...	7·8	23 30	...	...			
15	3·3	...	1·4	...	6·1	2·5	...	7·4	...	4·9	15·6	17 15	...	...			
16	3·0	1·6	...	9·0	...	1·8	8·8	...	3·6	...	6·6	17·0	13 10	...					
17	0·5	2·6	...	2·6	...	0·5	3·0	...	2·0	...	3·3	8·7	23 15	...					
18	4·9	...	...	5·9	...	4·1	...	2·7	...	4·1	11·7	23 55	...	...			
19	7·6	3·1	...	8·8	...	3·6	4·0	...	6·0	...	1·2	18·4	12 25	...					
20	1·6	...	4·0	...	...	4·9	...	4·0	...	3·3	10·0	22 10	...	...			
21	10·2	...	5·3	7·9	...	2·3	2·3	...	0·8	...	1·8	14·0	7 20	...					
22	3·2	2·2	...	7·1	...	4·7	8·2	...	3·4	...	3·7	15·7	16 5	...					
23	9·2	...	...	9·8	...	4·6	11·2	...	8·2	12·3	20·1	19 30	...	...			
24	8·2	12·3	...	7·2	7·2	...	3·1	4·7	...	Calm	19·6	7 50	...	...			
25	...	Calm	...	...	5·9	...	...	10·9	2·2	...	16·6	21 20	...	...			
26	6·2	...	4·2	9·5	...	6·6	...	...	1·1	1·7	14·2	0 5	...	...			
27	1·3	6·8	...	3·4	5·2	...	0·8	4·2	...	3·4	10·2	23 30	...	...			
28	2·8	6·7	...	9·5	1·5	...	7·7	...	3·9	9·4	16·1	5 10	...	...			
29	6·4	9·6	...	7·1	10·6	...	11·1	7·5	...	9·3	9·3	21·1	18 5	...					
30	...	11·1	11·1	...	6·0	9·0	...	6·0	9·0	...	8·1	19·7	3 25	...					
S+N & W+E	102·6	137·4	131·3	123·2	143·7	105·1	127·5	120·9	120·9	120·9	120·9	112·3	118·9	169·8	156·3	132·3	164·5	60·5	108·1
S-N & W-E	-8·2	122·2	-0·9	117·4	31·9	102·5	3·9	120·9	120·9	120·9	120·9	-11·7	(8·9)	8·6	118·7	-14·5	94·9	-7·1	91·9

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1·5 m., Ground 4·9 m., M.S.L. 57·3 m.

Day.	3 h.			9 h.			15 h.			21 h.			Vel. in Max. Hourly Run.	Time of Max.		
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.				
1	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	hrs.		
2	...	Calm	...	...	3·5	0·7	...	...	4·8	2·0	...	4·9	4·9	5·9
3	...	6·0	4·0	...	...	2·2	3·4	...	7·4	4·9	...	6·2	4·2	9·2
4	...	5·5	2·3	...	...	2·7	1·8	...	0·9	4·5	...	1·0	2·5	16 21
5	...	3·4	3·2	...	...	4·7	7·1	...	1·3	6·5	...	3·6	2·4	8·9
6	3·1	...	7·6	...	1·4	...	7·1	...	1·7	...	...	1·1	...	Calm
7	...	Calm	...	...	5·5	...	3·7	...	2·4	...	2·6	3·3	7·2	22
8	3·0	...	5·7	...	5·7	...	3·8	...	3·3	...	4·9	6·1	1·2	16 18		
9	...	...	6·1	...	6·1	...	7·7	...	1·5	...	4·3	...	1·4	14 16
10	3·2	...	2·2	...	4·9	...	4·9	...	4·4	...	10·6	2·1	2·1	12·1		
11	...	Calm	...	...	3·0	...	3·0	...	3·0	...	1·4	...	1·4	5·6
12	1·0	...	5·1	...	1·1	...	5·5	...	8·0	...	1·0	4·8	...	8·9		
13	...	...	5·1	...	5·1	...	5·1	...	5·1	...	7·5	...	7·5	15
14	...	3·6	1·5	...	7·8	...	7·8	...	4·6	...	6·8	4·6	...	9·8		
15	6·1	...	1·2	...	7·7	...	7·7	...	4·3	...	9·3	...	1·9	9·5		
16	8·7	...	1·7	...	9·2	...	9·2	...	4·3	...	9·9	1·3	...	9·2		
17	...	2·5	...	4·6	...	4·6	...	5·8	...	5·8	...	3·9	...	8·2		
18	...	...	2·5	...	2·5	...	2·5	...	2·5	...	6·9	3·4	...	15 17
19	...	2·3	...	2·3	...	2·3	...	2·3	...	2·3	...	5·8	5·2	...		
S+N & W+E	112·6	94·5	133·0	100·8	115·2	118·4	107·1	113·6	112·3	118·9	169·8	156·3	132·3	164·5	60·5	108·1
S-N & W-E	-76·2	+72·5	-70·8	+59·0	-48·6	+100·4	-76·7	+95·4	-11·7	(8·9)	8·6	118·7	-14·5	94·9	-7·1	91·9

ENGLAND S.W.:—SCILLY.

Height of Head above—Ground 9·8 m., M.S.L. 49·7 m.
Height of Cups above—Ground 5·8 m., M.S.L. 45·7 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.		
1	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	h m						
2	1·5	...	1·5	...	0·6	...	0·6	...	0·9	...	3·9	1·6	6·7	21 25
3	5·4	...	2·2	...	5·8	...	2·4	...	6·3	...	6·2	...	8·2	6 40
4	5·0	...	...	...	5·7	1·1	...	2·6	...	6·3	...	9·5	...	55
5	2·1	...	2·6	...	4·3	1·8	...	6·9	4·6	...	4·2	...	10·4	10 20
6	3·5	3·5	...	4·5	3·0	...	3·5	3·5	...	3·8	3·8	...	8·3	...
7	3·0	3·0	...	1·5	1·5	...	2·9	2·9	...	2·1	2·1	...	3·7	...
8	5·3	...	1·1	5·4	2·2	...	4·5	4·5	...	1·6	3·9	...	12·8	9 55
9	1·0	2·3	...	3·5	3·5	...	3·2	7·7	...	4·4	6·6	...	12·2	18 10
10	...	Calm	...	2·3	3·5	...	3·5	3·5	...	3·8	3·8	...	12·2	12 30
11	3·5	4·5	...	4·5	5·7	...	1·1	2·5	...	0·5	8·8	23 20	...	...
12	3·7	8·9	...	10·9	16·3	...	1·6	14·6	...	12·5	...	25·5	6 50	...
13	3·8	9·2	...	5·0	5·0	...	5·9	3·9	...	3·9	1·6	15·8	1 55	...
14	1·2	0·5	...	0·6	3·5	...	2·7	2·7	...	0·6	...	4·8	11 0	...
15	0·3	...	0·3	1·2	...	1·2	1·8	1·8	...	1·1	2·7	...	3·2	...
16	3·9	...	1·5	3·5	...	1·9	4·6	4·6	...	1·5	3·5	...	6·7	...
17	3·3	4·6	...	1·9	3·3	...	3·3	4·2	...	7·3	11 25	...	18 40	...
18	4·9	1·0	...	2·5	...	1·2	1·2	1·2	...	1·7	6·3	2 50	7 0	...
19	2·7	1·8	...	4·5	4·5	...	5·3	5·3	...	3·5	3·5	9·7	15 30	...
20	1·2	1·2	...	3·2	4·8	...	6·3	5·9	...	11·0	23 30	...	3·6	...
21</														

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ.	Remarks.
				A _{N.}	A _{E.}	A _{Z.}		
I	P	h m s	s	μ	μ	μ	8600	P sharply marked on vertical record.
	PR?	7 3 42	...	...	...	...
	S	7 7 11	...	...	...	...
	L	7 14 2	...	...	...	...
	F	7 30	...	...	...	...
9	L	7 24 20	21	Slight disturbance, including long waves of 18 secs. period.
	F	7 49	...	...	...	...
	...	19 25 to 20 17	...	...	...	...
	...	19 25 to 20 17	...	...	...	...
	...	5 36 to 6 0	...	...	...	...
29	O	23 14 14	8420	(Moderate) disturbance. Record much confused, with heavy wind effects.
	P	23 25 58	...	...	...	...
	S	23 35 39	...	...	...	...
	L	23 51	...	...	...	...
	Me	23 53 53	21	...	32	...		
30	L	8 0	Other phases indistinguishable, owing to wind effects.
		

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	o h.		6 h.		12 h.		18 h.	
	A_{N.}	T.	A_{N.}	T.	A_{N.}	T.	A _{N.}	T.
I	μ	s	μ	s	μ	s	μ	s
2	0'0	0	0'0	0	0'0	0	0'1	3
3	0'1	4'5	0'1	4	0'2	4	0'1	4
4	0'3	4	0'2	4	0'3	4	0'3	4
5	0'5	4	0'3	3'5	0'6	4	0'1	4
6	1'0	4	0'6	4	0'6	4	0'2	4
7	0'6	5	0'5	4	0'9	4	0'3	4
8	0'6	4'5	0'8	4	0'2	4	1'0	4
9	0'9	6	0'9	6	0'9	6	0'9	5
10	1'1	4	0'9	5	1'1	4	0'5	4'5
11	0'3	4	0'3	4	0'2	4	0'3	3
12	0'1	4	0'2	5	0'1	3	0'2	4
13	0'3	3'5	?	?	0'9	6	1'1	4
14	1'0	6	1'3	6	1'2	6	1'0	6
15	1'5	6	1'2	4	1'2	5'5	1'0	4'5
16	1'2	4	1'1	4	...	...	...	...
17	1'0	4	...	...	0'6	4	0'6	3'5
18	0'6	4	1'1	4	0'6	4	0'7	4
19	0'8	3'5	0'9	4	1'1	4	1'4	7
20	1'6	6	1'1	5	1'1	4	1'0	4'5
21	1'1	4	0'5	4	1'0	4	0'5	4'5
22	0'6	4	0'6	4	0'6	4	0'8	4
23	0'7	4	1'1	4	1'1	4	1'5	4
24	1'0	5	1'1	4	1'1	4	1'0	4
25	1'1	4	0'7	4	1'0	4	1'0	4
26	1'1	4	1'1	4	1'1	4	0'9	4
27	0'9	4	0'2	4	0'1	4	0'2	4
28	0'8	4	0'3	4'5	1'1	4	1'0	4'5
29	1'4	5	1'7	4	1'2	6	1'4	6
30	0	0	1'1	4'5	1'2	4	1'1	4

Means for Month $\left\{ \begin{array}{l} A_N = 0'7 \\ T = 4'2 \end{array} \right.$. Normals, 1911-18 $\left\{ \begin{array}{l} A_N = 0'5 \\ T = 4'5 \end{array} \right.$.

EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).

Day.	Times, G.M.T. of		Remarks.
	Commencement.	Max. Phase.	
1	h m ...	h m 7 40	Very small.
9	...	7 30	Small.
24	...	19 32	Very small.
29	...	15 13	Amp. on trace = 1'9 mm.
29	23 55	23 59	
30	7 48	8 3	Small waves to 8 h. 34 m.

10. SOUNDINGS WITH PILOT BALLOONS.

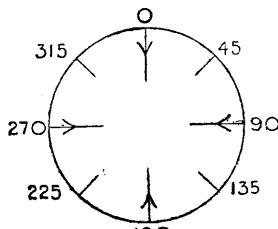
Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.														Cloud Observations.						
		Geostrophic.		By Anemometer.		At Heights above M.S.L.										Time, G.M.T. h. m.	Type.	Deg. from N.	mr/s.	Type.	Deg. from N.	mr/s.
		Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.							
ABERDEEN.																						
6	7 30	280	7	135	0'5	265	6'0	295	7'5	290	11'0	...	...	...	...	8 0	A-Cu., St-Cu.	280	3'5	Ci-Cu.	270	2'5
10	7 30	270	9	180	2'0	240	6'0	270	8'0	290	14'0	...	...	...	...	13 0	Cu.	270	4'5	Ci-Neb.	...	...
18	7 30	260	9	230	2'5	250	5'5	265	10'0	250	8'5	...	...	...	...	13 0	St-Cu.	270	4'0	...	...	...
ESKDALEMUIR.																						
3	7 20	360	6	40	3'0	25	2'3	345	7'5	355	12'5	350	17'5	...	...	...	Cu.	360	...	Ci.	360	...
3	12 5	360	4	360	2'0	350	2'8	340	4'7	360	14'0	...	...	...	...	...	St-Cu.	360	7'0	...	...	...
5	7 25	330	9	340	1'5	305	1'9	335	12'5	335	19'0	...	...	...	...	...	St-Nb.	...	...	A-St.	...	...
9	7 20	260	15	230	7'5	240	12'0	250	14'5	250	17'0	...	...	...	...	7 15	Fr-Cu.	...	...	Ci.	235	7'0
10	7 25	270	9	230	6'0	250	5'0	265	9'0	260	20'0	...	...	...	...	...	Cu., Fr-Cu.	270	...	...	...	...
12	7 30	135	13	40	2'6	75	4'5	135	5'5	160	12'0	170	15'0	...	...	...	St., Cu-Nb.	160	...	A-St.	205	...
14	7 15	240	4	140	0'5	330	0'2	240	2'6	250	5'0	265	10'5	270	10'0	7 55	Cu.	...	...	Ci., Ci-St.	205	...
17	7 15	260	4	140	1'0	260	2'8	255	7'0	240	9'0	250	13'5	230	16'0	7 50	Fr-St.	...	...	Ci-St.	265	4'5
17	12 5	225	5	200	4'7	205	6'0	190	3'1	240	12'5	...	...	...	...	12 25	Cu.	200	...	Ci-St.	230	5'0
17	17 15	260	4	205	6'0	225	6'0	230	8'0	230	12'0	...	...	...	...	17 40	Cu., A-Cu.	...	...	Ci., Ci-St.	230	4'5
18	7 15	260	9	255	6'5	270	6'0	260	12'0	250	16'0	...	...	...	...	6 50	Cu.	275	13'0	A-Cu.	235	8'0
18	12 0	260	7	250	8'0	250	8'5	260	12'5	255	11'0	...	...	...	...	12 25	Cu.	260	5'5	Ci.	260	6'0
20	7 15	260	12	245	8'5	240	8'5	265	13'0	260	14'5	265	14'5	...	...	...	Fr-Cu.	250	...	Ci-Neb.	...	...
20	12 30	270	10	240	5'5	235	8'5	235	15'0	245	7'0	...	...	...	...	...	Cu-Nb.	245	...	False Ci.	255	...
24	7 25	315	20	320	12'0	320	15'5	360	12'0	355	16'5	...	...	...	...	...	Cu-Nb., St-Cu.	340	...	A-Cu.	...	...
25	18 30	10	13	20	3'5	10	7'5	10	13'0	340	17'0	360	18'5	...	...	...	Cu.	360	...	...	...	...
26	12 0	360	9	345	3'5	345	7'5	360	4'1	350	11'5	355	18'0	360	16'5	12 40	Cu.	335	4'5	A-Cu.	360	5'5
26	17 10	315	8	360	3'0	325	4'5	310	3'0	340	8'5	350	17'5	...	...	17 35	A-Cu.	350	7'0	Ci., Ci-St.	360	5'0
27	17 20	270	12	270	6'0	265	7'5	280	17'5	315	6'0	305	6'5	315	7'5	17 50	Cu.	280	5'5	A-Cu.	335	3'5
30	7 15	315	17	320	15'5	315	19'0	350	10'5	335	15'5	...	...	...	...	7 0	Cu.	...	...	Ci-St.	325	2'0
S. FARNBOROUGH.																						
4	6 35	315	7	270	5'5	315	9'0	320	9'0	355	13'0	...	...	...	...	...	St-Cu.	...	...	A-Cu., Ci-St.	...	...
7	7 30	?	?	180	3'0	210	5'5	210	1'3	200	1'7	245	3'0	260	5'0	...	...	...	...	...	...	...
10	6 35	?	?	270	3'5	320	6'5	320	5'5	275	10'0	275	22'0	...	...	...	...	...	...	...	...	...
11	6 40	225	8	?	?	190	6'5	210	5'0	205	6'0	260	10'0	260	9'5	...	...	...	...	...	...	...
14	6 25	315	4	315	2'0	105	5'0	105	3'2	355	3'5	355	5'5	360	4'7	...	...	...	...	...	...	...
16	6 30	?	?	215	3'5	235	7'0	220	13'0	210	8'5	220	7'5	220	9'5	...	...	...	...	...	...	...
17	9 25	?	?	260	4'0	255	2'9	210	3'8	235	10'0	230	10'0	225	9'5	...	Fr-Cu.	...	...	Ci.	...	...
19	6 30	250	16	260	3'5	245	8'0	235	12'0	240	10'5	245	13'0	240	17'5	...	St.	...	...	Ci.	245	...
21	7 10	300	14	290	7'5	305	7'0	300	12'0	290	10'0	...	...	...	...	...	Fr-Cu.	...	...	Ci.	...	...
25	8 30	360	5	?	?	10	4'0	5	9'0	5	6'0	...	...	...	...	...	Nb.	...	...	...	...	...
27	7 15	310	7	290	3'5	305	5'5	305	2'8	340	7'5	...	...	...	...	...	St-Cu.	...	...	A-Cu.	...	...
28	6 35	290	15	270	6'0	295	14'5	285	15'5	285	8'5	315	13'0	340	12'5	...	A-Cu.	...	...	Ci.	350	...
CAHIRCIVEEN.																						
1	7 30	?	?	calm	...	50	3'6	35	7'0	50	4'9	...	...	...	...	...	Fr-Cu.	...	...	...	...	...
2	7 35	?	?	340	4'5	20	6'5	20	8'5	350	9'5	345	9'0	355	11'5	17 40	...	...	...	...	...	...
2	16 55	?	?	calm	...	10	4'5	5	7'5	15	11'5	...	...	...	...	...	Ci-Cu.	35	...	...	...	...
3	7 25	?	?	calm	...	15	4'8	5	7'5	20	11'5	15	14'0	15	15'0	...	Ci-Cu.	35	...	...	...	...
3	16 20	315	5	330	5'5	340	6'0	10	4'4	20	11'5	10	15'0	5	14'5	...	...	...	...	...	...	...
9	7 35	260	10	225	7'5	220	9'0	235	13'0	255	13'0	250	26'5	...	...	8 5	Fr-Cu.	...	...	...	...	...
17	7 25	260	5	calm	...	230	3'1	265	6'0	230	9'0	...	...	...	...	...	St-Cu.	245	5'0	...	...	...
18	7 25	270	7	260	4'2	275	5'0	280	8'5	270	13'5	275	15'5	260	16'0	8 20	Fr-Cu., Cu.	270	6'5	Ci.	300	4'5
20	7 20	260	7	280	2'7	265	4'6	295	6'0	260	9'0	...	...	...	...	7 45	St-Cu.	270	...	...	...	...
21	7 35	300	9	350	5'0	340	6'5	335	9'0	325	10'0	315	16'0	315	23'0	...	Cu.	...	...	Ci.	315	...
21	16 0	270	5	290	4'2	260	4'0	295	4'8	290	7'0	305	11'5	320	15'5	16 50	...	...	...	...	Ci.	185
26	11 20	350	8	315	7'0	350	7'0	345	11'5	355	17'5	...	...	...	...	11 50	Cu.	360	...	A-Cu.	360	...
(For observations at lower levels, see above.)																						
2	7 35	?	?	315	7'0	350	7'0	345	11'5	355	17'5	...	...	...	...	...	Fr-Cu.	...	...	...	...	...
2	16 55	?	?	315	7'0	350	7'0	345	11'5	355	17'5	...	...	...	...	...	St-Cu.	360	4'0	...	...	...
18	7 25	?	?</td																			

10. SOUNDINGS WITH PILOT BALLOONS—*continued.**Notes on Pressure Distribution.*

June 1919.

Height of Station above M.S.L. = H.
Anemometer above ground = h.

	H.	h.
Aberdeen	14 m.	32 m.
Eskdalemuir	242 m.	15 m.
S. Farnborough	70 m.	31 m.
Falmouth	51 m.	12 m.
Cahirciveen	9 m.	13 m.



Wind Protractor.

- During the whole month there was a persistent anticyclone over the Azores region.
- 1 7 h. High over the British Isles.
 - 2 7 h. to 6 7 h. Atlantic anticyclone covering the British Isles.
 - 7 7 h. Low centred W. of Iceland; Ridge from the Azores to Germany.
 - 9 7 h. , near the Faroe; , , , ,
 - 10 7 h. Anticyclone centred over the Channel.
 - 11 7 h. , , Holland.
 - 12 7 h. Low centred over the Irish Sea.
 - 14 7 h. Atlantic anticyclone covering the British Isles.
 - 16 7 h. Deep depression centred over Iceland.
 - 17 7 h., 13 h., 18 h. } Low over Iceland, High over the British Isles.
 - 18 7 h., 13 h. } Extensive shallow Low over the Baltic.
 - 19 7 h. South-westerly type.
 - 20 7 h., 13 h. Low centred over the Faroe, High over England.
 - 21 7 h., 18 h. Atlantic anticyclone covering the British Isles.
 - 24 7 h. North-westerly type.
 - 25 7 h., 18 h. } Atlantic anticyclone covering Iceland, the British Isles, and France.
 - 26 13 h., 18 h. } Extensive shallow Low over the Baltic.
 - 27 7 h., 18 h. Anticyclone over the British Isles centred S. of Ireland, Low centred N. of Iceland.
 - 28 7 h. Anticyclone over the British Isles centred S. of Ireland, Low centred N. of Shetlands.
 - 30 7 h. North-westerly type.

*Notes on Ascents.**Aberdeen*—

10th, Solar halo at 13 h.

Eskdalemuir—5th, 7 h. 25 m. Barometer unsteady.
9th, 7 h. 20 m. Barometer rising.
12th, 7 h. 30 m. Barometer falling fast.

17th, Solar halo at 7 h.

18th, 12 h. Sudden fall in wind speed between 1380 m. and 1750 m.

20th, Solar halo at 7 h.

26th, 12 h. Solar halo.

South Farnborough—10th, 6 h. 35 m. Aeroplane pilot reported small Cu. at 1200 m. and no bumps above that level.
17th, 9 h. 25 m. Pilot reported bumpiness between 700 m. and 900 m.*Cahirciveen*—1st, 7 h. 30 m. Cloud nearly stationary. Very hazy at surface.
3rd, 16 h. 20 m. Balloon shivered.
17th, 7 h. 25 m. St-Cu. sheet developing during ascent.
21st, 7 h. 35 m. St-Cu. dissolving away.
21st, 16 h. Fr-Cu. stationary over hills.

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN. Taken at 13 h. G.M.T.

Day and Hour. G.M.T.	Type of Cloud.	Velocity-height-ratio.				Remarks.	
		Degrees from N.	Milliradians per Second.	Components.			
				W.-E.	S.-N.		
2 13	Cu.	344	mr/s.	mr/s.	mr/s.	Cu. rather degraded.	
3 18	A-Cu.	343	11°0 6°2	+ 3°0 + 5°9	- 10°6 - 1°8	A-Cu. becoming St-Cu. later and fusing. Some hazy Ci-St. above.	
5 13	{ Ci-Cu. Cu.	328	4°0	+ 2°1	- 3°4	Ci-Cu. to high A-Cu., inclined to lenticular form.	
6 13	A-Cu.	320	11°0	+ 7°1	- 8°4	A-Cu. to high St-Cu.	
6 18	A-Cu.	302	3°3	+ 2°8	- 1°7	A-Cu. in lenticular sheets.	
7 15	St-Cu.	202	12°5	+ 4°7	+ 11°6	St-Cu. suddenly formed at 14 h. 30 m. Sudden squall at 17 h. 40 m., with violent eddying of cloud.	
10 13	Cu.	269	4°3	+ 4°3	0°0	Hazy Ci-St. above, with ⊕.	
11 13	Cu.	245	20°0	+ 18°2	+ 8°5	Fr-Cu.	
12 13	A-Cu.	165	3°8	- 1°0	+ 3°7	Small faint A-Cu.	
17 13	Ci-St.	235	5°1	+ 4°2	+ 2°9	Ci-St. to Ci-Cu., with Ci. threads intermingled.	
18 13	Cu.	268	4°2	+ 4°2	+ 0°1		
20 13	Cu.	265	2°8	+ 2°8	+ 0°2		
21 13	Cu.	310	5°0	+ 3°8	- 3°2		
24 13	Cu.	330	12°5	+ 10°8	- 6°3		
25 13	Cu.	347	11°0	+ 2°5	- 10°7		
26 13	St-Cu.	335	10°0	+ 4°2	- 9°1	St-Cu., of low altitude, dispersing.	
27 13	A-Cu.	305	2°2	+ 1°3	- 1°8	Ci-Cu. to high A-Cu., in lenticular sheets, fusing later.	

12. AURORA.

None reported.

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[Price 1s.]

1. SUNSHINE AND SOLAR RADIATION.

Day.	WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.					RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.					ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.					CAHIRCIVEEN.				
	Bright Sunshine.*		Radiation received on Horizontal Surface by Caleendar Radiograph.					Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.			Bright Sunshine.*		Radiation by Ångström Pyrheliometer.			Bright Sunshine.*				
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.		Amount.	Time.	mW/cm².	hr.	%	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	p sec Z.	Intensity.	Total.	Per cent. of Possible.
1	0.7	4	920	22	77	13 32	58	0.7	4	...	...	...	...	...	9.7	57	...	...	...	...	9.6	58
2	0.9	5	870	21	75	11 15	56	2.0	12	...	...	...	...	...	6.2	36	...	...	...	...	3.7	22
3	3.0	22	1315	32	84	10 12	83	2.6	16	...	...	...	...	...	0.9	5	...	...	...	...	3.7	22
4	4.1	25	1343	33	70	11 40	70	4.7	29	...	...	...	...	...	0.0	0	...	...	...	...	5.3	32
5	1.7	10	913	22	78	12 52	74	1.4	9	...	...	...	...	...	0.1	1	...	...	...	...	3.5	21
6	2.7	16	1243	31	73	15 30	28	2.1	13	...	...	...	...	...	0.1	1	...	...	...	...	3.1	19
7	0.0	0	357	9	19	15 27	12	0.0	0	...	...	...	...	...	4.7	28	...	...	...	...	4.8	29
8	0.0	0	549	14	24	9 2	17	0.2	1	...	...	...	...	...	10.0	59	...	...	...	...	13.6	83
9	10.4	64	1829	45	76	14 40	70	11.0	67	50	44	Ci.	13.6	79	...	...	...	...	...	...	...
10	4.2	26	1437	36	67	10 12	58	4.5	28	...	...	...	...	...	11.8	69	...	...	...	...	9.8	60
11	10.6	65	1987	49	75	11 43	75	11.4	70	...	...	...	...	...	3.0	18	...	...	...	...	0.0	0
12	1.0	6	649	16	49	16 20	15	1.2	7	...	...	...	...	...	3.0	24	...	...	...	...	12.1	74
13	5.9	36	1385	35	87	11 15	86	5.0	31	...	...	...	...	...	7.7	45	...	...	...	...	9.1	56
14	1.6	10	995	25	56	8 55	36	1.1	7	...	...	...	...	...	12.4	73	...	...	...	...	2.7	17
15	3.6	22	1370	35	73	13 40	56	6.4	40	...	...	...	...	...	2.3	82	...	...	...	...	2.3	14
16	x 11.4	71	x 2303	58	83	11 48	83	x 12.6	78	67	58	Clear	2.8	17	...	...	...	...	...	...	0.0	0
17	0.5	3	809	21	45	13 5	10	0.0	0	...	...	...	...	...	1.4	9	...	...	...	...	4.2	26
18	7.6	48	1659	42	83	11 40	83	7.0	44	...	...	...	...	...	0.5	3	...	...	...	...	0.0	0
19	1.5	9	1166	30	70	11 3	26	1.0	6	...	...	...	...	...	8.3	49	...	...	...	...	4.9	31
20	0.0	0	n 283	7	x 13	9 20	10	0.0	0	...	...	...	...	...	0.2	1	...	...	...	...	9.2	57
21	8.3	52	1594	41	x 95	12 6	x 95	7.4	47	75	65	Clear	8.5	51	...	...	...	...	...	...	0.0	0
22	6.3	40	1173	30	84	12 40	74	6.8	43	63	54	Clear	7.1	43	...	...	...	...	...	...	6.7	44
23	0.5	3	821	21	56	13 30	53	0.5	3	...	...	...	...	...	7.3	44	...	...	...	...	0.5	3
24	0.1	1	727	19	50	14 14	20	0.0	0	...	...	...	...	...	8.7	53	...	...	...	...	7.3	46
25	0.1	1	685	18	69	12 40	21	0.6	4	...	...	...	...	...	11.3	68	...	...	...	...	x 14.1	89
26	10.3	66	1978	52	76	14 5	75	11.8	75	55	47	Ci.	7.4	45	...	...	...	...	...	...	8.8	56
27	0.4	3	1096	29	65	13 42	56	2.5	16	...	...	...	...	...	0.3	2	...	...	...	...	0.5	3
28	0.3	2	656	17	33	13 30	27	0.1	1	...	...	...	...	...	1.3	8	...	...	...	...	6.8	43
29	0.1	1	631	17	57	12 40	43	0.1	1	...	...	...	...	...	11.5	71	...	...	...	...	9.5	61
30	3.2	21	961	28	60	13 22	35	3.9	25	...	...	...	...	...	13.7	85	...	...	...	...	10.7	69
31	10.9	71	2048	55	77	13 25	75	10.5	68	...	...	...	...	...	0.2	1	...	...	...	...	1.3	8
Means	3.65	23	1177	30	64	—	51	3.84	24	—	—	—	—	—	6.06	37	—	—	—	—	5.84	37
Normal	5.84	37	1311	33	—	—	—	6.48	41	—	—	—	—	—	5.00	30	—	—	—	—	5.13	32
	— 35 years—	— 7 years—	— 35 years—	— 30 years—	— 35 years—	— 35 years—	— 35 years—	— 35 years—	— 35 years—	— 5 years—	— 5 years—	— 45 yrs.	— 30 years—	— 45 yrs.	— 45 yrs.	— 45 yrs.	— 45 yrs.	— 45 yrs.	— 45 yrs.	— 35 years—	— 35 years—	

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9.1 m. H_b = 13.7 m. H_a = 26.4 m. Above Ground: h_t = 1.3 m. h_r = 0.56 m. h_a = 13.9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.		Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0-10) and Weather.		Rain 0 h. to 24 h.		Min. Temp. on Grass.		REMARKS.		Magnetism.	
	9 h.	21 h.	9 h.	21 h.	Vapour Pressure.	Percentage.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	a.	200+	Horizontal Force, Declination West, and Inclination.	
	mb.	mb.	200+	200+	millibar.	%	11.0	10.3	78	76	30	4	345	7	0.1	82	Fair n. and morning. Fine day.	
1	1011.4	1010.6	85.3	84.6	88	84	11.0	10.3	78	76	30	4	345	7	0.1	82	c. n. c. to o. day.	
2	1011.8	1013.2	85.8	85.3	n 87	84	12.0	12.9	82	91	345	6	335	3	0.4	82	o. and d. n. o. a. Fair evening.	
3	1013.2	1014.5	86.0	87.1	90	85	13.8	14.0	93	88	330	3	—	0	0.7	85	Fair and Δ n. Fair a. \bullet and T p.	
4	1015.7	1015.6	87.1	85.3	90	82	12.3	12.3	77	87	25	6	35	4	2.0	78	c. and p. n. c. to o. and d. a. c. to o. p. and T p.	
5	1014.9	1017.1	86.3	87.2	89	84	11.9	13.4	79	83	30	8	75	2	3.3	82	Fine and Δ n. Fine dry day and ∞ .	
6	1019.5	1019.6	89.0	87.9	92	83	13.5	14.1	75	84	20	4	—	1	—	78	Fine and Δ n. Fine dry day and ∞ .	
7	1018.1	1018.0	89.0	86.8	90	84	15.4	13.9	86	89	—	1	305	2	—	80	c. and ∞ n. Fine and ∞ o. day.	
8	1019.4	1023.6	86.1	84.9	89	84	12.9	11.2	86	81	335	5	345	5	—	84	c. and ∞ n. o. to e. a. Fair p.	
9	1025.9	1027.1	89.7	86.8	91	82	13.6	13.6	72	87	—	1	10	2	—	78	Fine and Δ morning. Fine day.	
10	1026.0	1023.7	87.0	86.2	89	85	13.6	12.8	86	85	350	6	360	4	9	82	Fine to o. morning. Fine day.	
11	1020.9	1017.9	87.8	86.8	88	86	15.6	13.9	98	89	290	2	315	4	10	83	Fine n. o. to \equiv morning and day. c. evening.	
12	1021.3	1026.8	85.6	85.0	88	84	11.1	10.6	77	76	355	6	350	4	9	82	c. to o. n. and morning. Fine dry day.	
13	1028.7	1028.0	86.5	85.0	89	83	11.1	12.8	72	92	300	5	285	6	8	82	Fair n. and a. \bullet a. Fair day. o. to \bullet^0 p.	
14	1026.2	1026.3	86.7	86.4	89	86	14.4	13.6	93	89	305	8	—	1	10	78	d. morning	

3. METEOROLOGY :—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28'$ N. Long. $0^{\circ} 19'$ W.Heights above Mean Sea Level :—Rain-gauge Site, $H = 5.5$ m. Barometer, $H_b = 10.4$ m. Cups of Anemometer, $H_a = 25$ m.Heights above Ground :—Thermometers, $h_t = 3.0$ m. Rain-gauge, $h_r = 0.53$ m. Cups of Anemometer, $h_a = 20$ m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.					Humidity.			Wind—Veer from North in degrees and Speed in metres per second.				Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.				
			Vapour Pressure.			Percentage.																	
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.							
1	mb.	mb.	a.	a.	200+	200+	200+	200+	10'4	10'9	84	86	315	2	247	2	10	10	200+	[Showery.			
2	1000.9	999.6	83.3	83.6	88	82	10.4	10.9	84	86	326	4	—	1	10	3	8	8.0	80	Dull in a. and at n. Fine in p., with T.			
3	1002.4	1007.2	85.3	84.4	88	82	11.3	12.6	80	94	247	3	225	2	10	8	6.1	78	T in a. Dull and showery. R 18 h. 20 m.				
4	1009.8	1011.9	86.1	85.9	90	82	11.2	12.7	75	86	191	3	79	2	7	10	5.5	76	Fair to showery.				
5	1012.4	1011.9	88.8	85.9	91	81	12.8	13.4	72	91	191	3	—	2	7	10	4.0	83	Dull early. Dull later. • in p. and at n.				
6	1015.0	88.0	87.1	93	86	15.0	13.9	89	87	—	1	23	4	10	10	4.0	83	Fine early. Fine in a. • in p. and at n.					
7	1018.0	1018.6	84.1	86.2	91	83	11.2	11.4	85	76	40	4	30	3	10	—	—	83	Overcast and dull.				
8	1018.5	1017.2	83.8	86.1	87	83	9.5	11.2	74	75	40	2	40	2	10	—	—	83	Overcast and dull.				
9	1022.0	1022.1	87.4	91.1	96	n 79	12.7	13.4	78	65	360	2	30	2	5	5	—	—	83	Overcast and dull. Clear at n.			
10	1021.1	1018.1	89.9	88.1	93	85	13.7	13.3	72	78	30	2	—	0	2	9	—	—	80	Fine in a. Overcast later.			
11	1015.6	1012.0	89.9	93.0	x 98	85	14.1	13.7	74	59	350	2	—	1	1	2	—	—	80	Fine. ∞			
12	1012.5	1016.3	85.7	85.9	91	83	13.1	9.9	90	67	360	3	320	2	10	2	9.2	85	Dull and rainy.				
13	1020.3	1021.1	86.7	87.2	91	82	10.7	9.1	69	57	320	3	300	3	10	9	—	77	Dull early. Fine in a. and p.				
14	1018.2	1015.9	87.1	87.9	91	85	12.1	12.7	76	76	270	3	—	1	9	5	2.3	80	Dull to fair and fine. • in a.				
15	1015.2	1020.9	86.2	86.1	90	83	8.7	10.4	58	69	340	7	30	2	8	1	—	—	80	Overcast early. Fine to fair.			
16	1021.6	1018.7	88.8	92.0	97	80	12.1	15.2	68	70	260	2	240	4	1	6	—	n 74	Fine day.				
17	1018.1	1016.2	90.4	91.1	95	x 89	16.3	17.1	83	83	240	3	220	2	10	5	—	87	Overcast and dull. Fair at n.				
18	1013.7	1009.1	92.8	90.5	x 98	86	16.9	14.9	74	75	220	2	200	2	6	2	—	80	Fair to fine. ∞ in a.				
19	1006.6	1004.8	90.7	88.7	93	87	14.6	15.9	73	90	210	3	190	1	9	10	3.7	84	Fair in a. Overcast in p., with •.				
20	1007.2	1015.2	84.2	84.7	89	84	11.9	12.3	90	90	300	5	290	3	10	10	x 14.5	84	Dull and overcast, with •.				
21	1019.8	1019.1	88.5	88.6	91	82	11.4	14.9	65	85	280	3	230	3	4	10	0.2	77	Fine in a. to dull at n.				
22	1013.1	1014.8	86.6	88.1	92	86	13.6	10.4	88	61	330	4	310	2	10	5.3	86	Dull in a., with •. Fine in p.					
23	1014.8	1016.1	88.0	88.6	90	86	12.5	12.1	74	69	300	5	340	6	9	10	—	82	Dull or fair all day.				
24	1019.1	1020.2	87.3	86.5	90	86	12.1	13.1	75	85	350	3	—	1	10	5	—	84	Dull to fair in a. and p. Fine at n. \equiv^0 .				
25	1021.3	1022.9	85.9	86.9	90	85	12.8	12.1	87	77	—	1	20	2	10	10	3.8	80	Overcast in a., with • ⁰ to fair in p.				
26	1023.7	1020.5	85.8	88.5	93	84	9.9	13.8	67	79	10	2	170	3	4	10	0.6	82	Fine all day. ∞ in p. Fair at n.				
27	1020.1	1019.3	87.2	87.6	91	85	11.9	11.9	74	72	40	2	10	2	7	10	0.1	84	\equiv^0 , with • ⁰ p. in a. Fair or dull.				
28	1020.0	1021.1	85.6	86.1	88	83	9.0	12.7	62	85	360	2	—	1	10	10	—	80	Fair in a. Remainder dull.				
29	1021.4	1021.9	85.6	86.4	88	84	10.7	11.0	79	72	360	3	360	2	9	9	0.1	83	\equiv^0 \square early. Dull all day.				
30	1023.2	1023.4	85.7	86.5	92	84	9.9	12.9	68	84	40	2	—	1	10	1	—	83	∞ all day. Dull in a. and p. Fine n. \equiv				
31	1023.0	1019.7	88.9	90.3	x 98	81	13.6	14.3	76	73	360	2	220	4	0	8	—	76	$\square \equiv$ in a. Fine most of day, with ∞ .				
Means	1016.2	1016.5	87.0	87.5	91.5	83.7	12.1	12.7	76	77	2.8	2.0	—	7.8	7.1	67.4	80.9	Monthly Totals or Means.					
Normal	1014.7	1014.5	90.1	89.5	94.7	85.4	13.7	14.1	71	76	3.4	2.4	—	—	—	60.1	—	Normals.					

4. METEOROLOGY :—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19'$ N. Long. $3^{\circ} 12'$ W.Heights above Mean Sea Level :—Rain-gauge Site, $H = 242$ m. Barometer, $H_b = 237.3$ m. Vane of Anemometer, $H_a = 250$ m.Heights above Ground :—Thermometers, $h_t = 0.9$ m. Rain-gauge, $h_r = 0.38$ m. Vane of Anemometer, $h_a = 15$ m.

Day.	Temperature at or below the normal freezing point of water are printed in small type.					REMARKS.														
						Air Pressure at Station Level.		Temperature.			Humidity.		Wind.		Cloud.			Rain.	Temperature.	
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.
1	977.2	978.2	86.2	82.3	88	80	9.0	9.7	60	83	20	12	30	6	2	10	2.1	77	Very fine y. a. e. to o. p. o. g. p ⁰ . n. • after 23 h.	
2	981.1	982.8	85.3	83.0	88	81	11.3	9.9	80	81	30	7	10	6	9	9	1.5	81	• ⁰ \equiv^0 early. o. toc. \oplus a. and p. o. ∞ n. • ⁰ after 23 h.	
3	983.6	988.3	84.0	82.5	87	82	10.9	10.9	84	92	30	10	30	7	10	10	1.5	81	Dull, with occasional • ⁰ \equiv^0 all day.	
4	988.6	989.4	82.4	81.9	n 84	81	10.7	9.9	91	88	40	10	30	5	10	10	—	81	o. with \equiv^0 and scarcely appreciable d.	
5	989.8	991.4	83.2	82.4	85	80	9.7	10.3	79	88	30	6	40	4	10	10	0.2	80	d. \equiv^0 until 2 h., then o. all day.	
6	992.5	993.0	82.4	82.3	87	81	10.3	9.8	88	84	40	3	50	3	10	10	—	80	Dull a. and p. c. to o. n.	
7	992.3	991.0	82.4	83.7	90	80	10.2	10.9	87	85	—	0	30	3	10	9	—	76	o. \equiv^0 a. o. till 15 h., then b. p. b. c. ∞ n.	
8	991.0	992.6	82.5	85.9	91	78	9.7	12.5	82	85	40	5	—	1	9	4	—	74	b. \equiv^0 1h. o. till 10 h., then b. a. and p. b. c. ∞ n.	
9	994.2	996.0	91.0	83.2	x 94	78	13.5	10.5	66	85	170	2	—	1	6	2	—	76	\equiv^0 \square . b. c. $\oplus \infty$ a. and p. b. ∞ to \equiv n.	
10	994.3	991.1	89.0	85.3	x 94	79	13.7	10.5	76	74	270	3	—	1	3	3	—	75	\equiv^0 till 8 h., then very fine. b. ∞ n.	
11	987.6	984.1	86.6	83.7	92	77	13.9	9.7	90	76	200	6	280	3	10	6	0.1	—	b. ∞ to o. \equiv a. d. \equiv^0 a. b. c. y. p. b. c. n.	
12	984.1	989.6	84.9	81.5	88	79	9.2	9.4	67	85	320	5								

5. GEOPHYSICS:—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.						Magnetic Character of Day.	Electric Character of Day.	Charge per cc. $\times 10^{20}$	Air-Earth Current $\times 10^{16}$.	Potential Gradient, Volts per metre. Factor 1.95.				
					Horizontal Comp't.		Declination.		Inclination.										
	0.3 m.	1.2 m.	Daily Mean.	Extremes.	Mean Time.		Mean Time.	West.	Mean Time.	North.	+	-	About 15 h.	About 15 h.	3 h.	9 h.	15 h.	21 h.	
a.	a.				h m	γ	h m	o	h m	o			Coulomb.	Amp/cm ² .	v/m.	v/m.	v/m.	v/m.	
1 200+	200+	cm.	cm.		h m	γ	h m	o	h m	o	1	2	...	0.41	...	-60	130	-415	50
2 86.3	85.9	231	231		...	...	...	...	...	...	o	1	...	...	...	95	155	95	200
3 86.7	85.9	231	...		...	...	...	...	...	...	o	1	...	...	...	85	215	130	320
4 86.7	85.8	230	...		11 16	18404	14 24	14 47'2	14 28	66 56'7	o	1	...	...	...	225	145	120	285
5 87.4	85.8	228	...		...	...	...	...	...	...	o	1	...	...	...	320	355	355	240
6 87.7	85.7	228	...		...	...	...	...	...	...	o	o	...	...	...	190	240	155	190
7 87.6	85.8	227	...		...	...	...	...	...	...	i	o	...	...	...	95	295	355	450
8 87.1	85.8	226	...		...	...	...	...	...	...	i	o	0.35	0.39	0.80	200	215	95	295
9 86.2	85.9	225	...		...	...	...	...	...	...	i	1	0.47	0.18	1.15	215	295	240	155
10 88.5	85.9	223	...		11 3	18383	14 21	14 48'1	14 25	66 56'5	o	o	0.23	0.08	0.85	120	240	295	285
11 88.9	85.8	222	...		...	...	...	...	...	...	i	o	0.08	0.04	0.30	105	215	145	60
12 89.9	85.9	221	...		...	...	...	...	...	...	i	1	...	...	...	145	z±	145	240
13 88.1	86.0	221	...		...	...	...	...	...	...	i	1	...	...	...	120	165	120	165
14 88.1	86.0	220	...		...	...	...	...	...	...	o	1	0.08	0.06	0.90	155	180	145	200
15 88.0	86.0	220	...		...	...	...	...	...	...	o	o	0.64	0.37	1.00	120	215	165	490
16 87.2	86.0	220	...		...	...	...	...	...	...	o	o	0.21	0.18	0.70	190	215	145	180
17 89.3	86.1	220	...		11 2	18411	...	...	14 29	66 55'8	2	o	...	...	...	190	120	165	215
18 89.3	86.1	219	...		...	...	...	...	14 27	14 48'5	1	o	0.41	0.16	1.65	200	430	130	165
19 89.9	86.2	220	...		...	...	...	...	...	...	o	1	...	...	...	70	180	130	285
20 89.6	86.3	220	...		...	...	...	...	...	...	o	2	...	...	...	105	-60	200	155
21 87.9	86.5	219	...		...	...	...	...	...	...	o	o	0.31	0.31	1.30	225	295	215	240
22 88.6	86.5	219	...		...	...	...	...	...	...	i	1	0.41	0.23	0.45	95	285	130	225
23 88.5	86.5	219	...		...	...	...	...	14 34	66 58'9	2	o	...	...	...	85	180	60	165
24 88.2	86.5	218	...		11 4	18376	14 21	14 46'8	...	...	i	1	0.35	0.12	0.55	25	190	250	145
25 88.0	86.5	218	...		...	...	...	...	...	...	o	1	0.16	0.14	0.30	-35	190	200	215
26 88.3	86.6	217	217	...	...	...	...	...	...	...	o	1	...	...	...	240	225	145	95
27 89.5	86.5	217	217	...	...	...	...	...	...	...	o	1	...	...	...	60	165	120	165
28 89.1	86.6	218	...		...	...	...	...	...	...	o	o	...	...	...	145	275	180	225
29 88.1	86.6	220	...		...	...	...	...	...	...	o	o	0.29	0.16	1.60	60	190	190	370
30 87.8	86.6	220	...		...	...	...	...	...	...	o	o	0.21	0.16	0.50	190	295	250	215
31 87.7	86.6	220	...		...	...	...	...	14 32	66 54'7	o	o	0.64	0.25	...	95	95	...	190
M.	88.1	86.2	222	—	—	—	—	—	—	—	—	—	—	—	—	126†	215†	156†	222†
90.0	87.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
← 12 years →																			

† Mean for 29 days.

6. GEOPHYSICS:—ESKDALEMUIR.

Day.	North Component.			West Component.			Vertical Component.			Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 7.24 to 13'' on 10, 9.63 after.							
	Maximum. 15000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	Maximum. 44000 γ +.	Minimum. 44000 γ +.	Range.			3 h.	9 h.	15 h.	21 h.				
	h m	γ	h m	h m	γ	h m	h m	γ	h m	γ	i b	v/m.	v/m.	v/m.	v/m.				
1 21 39	1098	969	11 37	21 38	938	847	8 3	91	18 28	1122	1091	12 30	31	1	150	260	85	85	
2 1057	973	12 22	84	15 34	938	839	8 25	99	18 38	1120	1089	12 30	31	1	145	160	130	165	
3 1045	926	11 56	119	14 48	923	842	9 34	81	17 30	1132	1095	11 14	37	1	45	110	100	165	
4 1039	960	12 1	79	15 53	921	847	8 15	74	19 12	1127	1095	11 53	32	o	225	130	95	145	
5 1025	965	12 1	60	16 20	913	849	8 23	64	18 30	1124	1096	o 30	28	o	260	70	20	95	
6 1034	968	11 18	66	14 20	921	839	9 9	82	4 30	1119	1098	13 18	21	o	30	15	85	130	
7 1060	981	12 44	79	16 35	941	831	8 25	110	21 15	1137	1095	12 17	42	i	85	20	135	310	
8 1066	950	13 57	116	14 17	950	828	5 57	122	17 23	1148	1063	3 18	85	i	180	305	200	320	
9 1079	942	11 30	137	13 53	934	834	7 41	100	17 28	1125	1080	1 10	45	i	335	195	210	225	
10 20 24	1058	933	11 19	15 22	930	850	6 25	80	18 25	1137	1108	12 55	29	i	450	180	385	325	
11 19 46	1055	955	11 54	10 43	932	834	9 0	98	17 20	1126	1099	13 19	27	i	105	210	135	290	
12 1063	959	12 20	104	15 3	932	851	6 44	81	18 50	1136	1094	11 55	42	o	240	210	†	†	
13 19 10	1056	961	14 2	95	15 47	929	852	4 27	77	19 30	1133	1094	13 6	39	i	†	†	-20	200
14 17 55	1032	949	12 32	83	15 40	914	6 1	70	18 30	1127	1100	11 8	27	o	200	180	145	105	
15 19 31	1031	976	11 4	55	14 35	922	852	8 50	70	7 0	1122	1102	12 42	20	o				

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$ Heights above M. S. L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1·48 m. h_r = 1·72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.						Min. Temp. on Grass.	Percentage of Humidity.			Rain 0 h. to 24 h.	REMARKS.	Earth Current Character.	
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.	Mean of 5 Readings.		9 h.†	14 h.	21 h.	Mean.			
1	mb. 997·8	mb. 997·9	mb. 999·3	mb. 998·3	a. 200+	a. 200+	a. 200+	a. 200+	a. 200+	a. 200+	78·6	% 95	% 72	% 79	% 82	5·5	• ² a. • ⁰ and sun 14 h.	
2	1000·S	1002·9	1005·0	1002·9	85·6	85·6	87·1	84·8	87·2	n 87·4	82·8	84·7	70	74	78	2·0	● 1 h.	
3	1008·6	1009·8	1009·9	1009·4	87·6	87·6	89·7	86·8	91·6	83·6	87·9	79·4	76	63	90	76	9·0	
4	1006·6	1006·5	1006·2	1006·4	86·0	87·1	86·0	87·9	85·8	86·6	85·9	98	92	95	95	x 14·2	• ² 20 h. • ² all day.	
5	1006·7	1007·0	1007·4	1007·0	87·9	89·0	87·8	91·0	85·2	88·2	82·7	87	83	84	85	—	—	
6	1008·9	1009·8	1010·3	1009·7	88·2	88·9	86·3	92·0	85·3	88·1	82·2	86	84	93	88	—	[20 h.]	
7	1011·1	1010·2	1009·8	1010·4	85·6	87·6	85·2	88·0	85·4	86·3	84·3	95	87	96	93	9·4	T 8 h. 35 m. K 9 h. 30 m. • ² 9 h. and	
8	1009·5	1012·2	1015·0	1012·2	87·5	87·6	85·0	89·0	84·9	86·8	83·9	72	66	91	76	—	■ 4 h. — 7 h., then fine weather.	
9	1017·4	1017·8	1017·7	1017·6	90·3	92·2	88·2	93·2	85·0	89·8	78·5	79	67	85	77	—	—	
10	1015·7	1013·9	1012·6	1014·1	91·8	94·9	88·3	95·7	85·4	91·2	80·0	74	63	79	72	—	Fair a. Cloudy n. ⊕ 18 h.	
11	1011·3	1010·6	1009·5	1010·5	91·4	95·4	88·4	x 96·0	86·0	91·4	81·3	76	59	84	73	—	Fair.	
12	1008·3	1011·0	1013·3	1010·9	89·2	86·8	89·6	85·6	88·1	81·6	91	85	82	82	0·5	● 10 h.		
13	1018·7	1020·5	1020·7	1020·0	86·1	88·6	85·9	90·0	84·3	87·0	80·4	62	n 51	66	60	—	Fair.	
14	1017·4	1016·3	1014·9	1016·2	87·0	88·1	87·3	89·0	84·9	87·3	79·2	83	87	91	87	0·5	● 7 h. 50 m.	
15	1012·3	1013·9	1016·0	1014·1	87·0	90·0	87·3	91·2	85·9	88·3	85·4	79	65	84	76	1·0	● 3 h. Cloudy a. Fair n.	
16	1017·9	1017·9	1016·7	1017·5	90·1	90·0	86·8	91·2	84·0	88·4	77·4	67	74	88	76	—	■ 4 h. 30 m. — 5 h. 30 m. ■ 21 h.	
17	1015·0	1013·9	1012·6	1013·8	87·7	90·3	85·9	92·8	85·5	88·4	79·8	85	76	98	86	—	■ 2 to noon. Fog on the harbour 14 h	
18	1009·3	1007·7	1005·4	1007·5	87·8	89·7	87·0	93·6	85·1	88·6	85·6	94	73	92	86	—	● 2 7 h. ■ 2 14 h. 30 m. passing.	
19	1002·3	1000·3	1002·9	1001·8	87·7	88·2	87·1	89·9	85·8	87·7	80·5	96	90	94	5·3	—	—	
20	1008·7	1011·4	1014·7	1011·6	89·0	90·5	86·2	x 92·0	88·4	88·8	83·5	68	57	80	68	—	—	
21	1019·3	1020·2	1019·5	1019·7	88·5	88·9	87·6	90·4	85·3	88·1	80·9	77	77	93	82	0·4	● ⁰ showers afternoon. ● ² 20 h.	
22	1015·4	1013·8	1012·6	1013·9	87·9	88·0	86·5	89·0	85·6	87·4	87·0	98	98	95	97	2·2	● ⁰ all day.	
23	1013·4	1013·5	1013·3	1013·4	89·2	89·9	87·0	91·1	84·8	88·4	80·3	70	72	86	76	—	—	
24	1014·1	1014·9	1015·0	1014·7	88·6	87·0	x 92·0	x 86·4	88·5	82·6	77	62	88	76	—	—		
25	1015·8	1015·8	1016·9	1016·2	88·4	93·0	87·5	94·0	85·5	89·7	80·4	84	61	83	76	0·6	● 10 h. Fair afternoon.	
26	1017·8	1017·7	1018·2	1017·9	90·6	93·0	87·8	94·2	84·8	90·1	79·5	73	64	78	72	—	Fair.	
27	1015·4	1014·0	1012·9	1014·1	89·9	94·5	87·7	95·0	85·0	90·4	79·2	84	54	84	74	—	Fair.	
28	1013·1	1013·8	1015·3	1014·1	89·3	91·9	85·9	92·7	85·4	89·0	83·9	75	55	69	66	—	● 8 h. 45 m.	
29	1015·9	1015·9	1016·2	1016·0	89·0	90·9	85·8	91·1	86·0	88·6	79·9	84	62	76	74	0·2	—	
30	1016·5	1016·7	1017·5	1016·9	87·2	90·0	85·8	90·2	83·3	87·3	79·9	65	57	82	68	—	Overcast a. Fair n.	
31	1019·3	1018·7	1018·3	1018·8	89·5	92·5	86·9	93·0	83·2	89·0	n 75·5	76	59	81	72	—	Fair.	
Means	1012·3	1012·5	1012·7	1012·5	88·3	90·0	86·7	91·4	85·0	88·3	81·3	81	71	85	79	50·8	—	
Normal	1011·2 26 years	1011·3 26 years	1011·4 26 years	1011·3 26 years	90·1	92·1	88·3	93·3	89·4	90·6	83·2	?	67	83	?	45·6	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).			Mean of Force	Sunshine.*	Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.														
						Upper.		Lower.		Upper.		Lower.		Upper.		Lower.				
	Total.	Per cent. of Possible.	Tenths.			Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.	Mean Amount.
9 h.†	14 h.	21 h.	9 h.†	hr.	%	10	Nb.	Cu.-Nb.	WNW	7	Cu.-Nb.	{ NW	10	A.-Cu.	...	Nb.	NW	9·0
1	293 3	315 3	293 3	3·0	3·4	21	A.-Cu.	10	2	A.-Cu.
2	270 3	270 4	315 2	3·0	8·2	51	8	Cu.-Nb.	...	10	...	...	...	Cu.-Nb.	WNW	...	...	...	6·7
3	270 3	247 3	247 3	3·0	11·9	74	7	...	...	1	...	...	...	Cu.	...	10	...	...	6·0
4	225 2	247 2	337 1	1·7	0·2	2	10	...	...	10	...	...	...	Nb.	...	10	...	...	10·0
5	360 2	360 1	67 3	2·0	6·6	41	8	A.-Cu.	NE	Cu.-Nb.	NNE	8	...	A.-Cu.	SE	10	A.-Cu.	...	7·7	
6	45 4	67 5	67 5	4·7	5·1	32	7	Ci., A.-Cu.	...	...	...	8	A.-Cu.	SE	10	...	...	...	8·3
7	67 3	45 4	45 4	3·7	0·3	2	10	...	...	9	...	...	...	Nb.	...	10	...	...	9·7
8	23 3	360 3	— o	2·0	6·6	41	7	Ci.	...	Cu.-Nb.	NNE	7	...	Ci.	...	6	...	...	6·7
9	270 1	360 2	— o	1·0	11·7	74	0	...	...	2	...	...	...	...	o	...	...	...	0·7
10	225 1	45 1	23 3	1·7	12·3	77	0	...	...	6	A.-Cu.	NE	Cu.-Nb.	S	6	A.-Cu.	NE	NE	4·0
11	203 1	270 2	293 1	1·3	15·7	98	0	...	...	10	...	...	...	Cu.	...	2	A.-Cu.	...	...
12	315 3	315 3	337 3	3·0	5·0	32	10	...	...	10	...	...	...	Cu.-Nb.	NW	3	Ci.-Cu.	...	7·7
13	337 4	315 4	315 3	3·7	13·4	85	5	...	...	4	...	...	...	Cu.	NW	0	...	...	3·0
14	247 4	247 4	315 3	3·7	0·2	1	10	...	...	10	...	...	...	Cu.-Nb.	WNW	10	...	Cu.-Nb.	NW
15	337 5	337 4	315 4	4·3	12·2	77	10	2	A.-Cu.	o	Cu.	W	4·0
16	270 3	293 3	270 2	2·7	14·5	92	1	...	...	7	A.-Cu.	SW	...	...	6	A.-Cu.	NE	W	4·7
17	247 2	247 2	360 2	2·0	7·2	46	10	...	...	5	A.-Cu.	SW	...	...	10	...	...	...	8·3
18	225 1	225 3	293 1	1·7	7·1	45	1													

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 8' 8 m., Ground 13' 7 m., M.S.L. 19' 2 m.
Height of Cups above—Roof 4' 6 m., Ground 7' 6 m., M.S.L. 15' 2 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.	
	S.	N.	W.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.		
1	... 10' 9	... 2' 2	...	... 7' 4	... 1' 5	...	...	... 8' 5	... 3' 5	...	... 9' 6	... 1' 9	...	19' 4	16 50
2	... 7' 6	... 5' 1	...	... 6' 6	... 4' 4	...	...	... 5' 1	... 1' 0	...	... 4' 5	... 1' 9	...	12' 6	0 15
3	... 5' 1	... 1' 0	...	... 7' 4	... 1' 5	...	...	... 7' 1	... 1' 4	...	... 4' 8	... 1' 0	...	14' 0	7 10
4	... 4' 9	... 3' 3	...	... 4' 4	... 4' 4	...	...	... 5' 8	... 1' 8	...	... 9' 0	... 1' 0	...	13' 0	22 40
5	... 8' 2	...	...	... 8' 2	... 3' 8	...	...	... 5' 7	... 3' 1	...	... 4' 7	... 1' 3	...	3 35	
6	Calm	...	...	...	5' 2	...	...	... 5' 2	... 3' 4	...	... 3' 3	... 9' 1	...	5 55	
7	1' 2	... 2' 7	...	4' 1	... 2' 7	...	...	2' 9	... 4' 3	...	1' 3	... 3' 0	...	7' 5	8 30
8	2' 2	... 3' 2	...	4' 3	...	...	...	3' 9	...	...	3' 3	1' 4	...	6' 5	14 10
9	4' 3	2' 0	...	4' 0	1' 6	...	...	1' 9	1' 3	...	1' 3	0' 9	...	7' 3	11 50
10	1' 3	0' 9	...	4' 9	...	...	...	3' 5	...	...	2' 0	...	...	9' 0	7 5
11	1' 3	0' 9	...	1' 8	2' 7	...	...	4' 4	...	...	1' 8	4' 3	...	13' 4	19 30
12	6' 2	4' 2	...	7' 4	4' 9	...	...	7' 1	1' 4	...	9' 3	1' 9	...	14' 0	20 35
13	8' 5	5' 7	...	6' 3	6' 3	...	...	3' 4	8' 2	...	5' 3	7' 9	...	14' 0	23 5
14	3' 0	7' 3	...	4' 6	6' 8	...	...	3' 0	3' 0	...	6' 0	6' 0	...	11' 8	7 20
15	7' 1	1' 4	...	5' 5	1' 1	...	...	1' 8	0' 8	...	2' 6	...	...	15' 4	6 10
16	3' 5	...	3' 5	2' 3	...	2' 3	...	0' 3	1' 6	...	2' 2	1' 4	...	7' 0	1 45
17	3' 6	...	2' 5	1' 7	...	1' 7	...	2' 3	2' 3	...	2' 3	7' 5	...	22 40	
18	3' 6	2' 4	...	7' 3	3' 0	...	...	6' 6	4' 4	...	6' 1	1' 2	...	14' 3	22 25
19	5' 2	...	3' 4	...	2' 5	6' 1	...	3' 5	0' 7	...	5' 6	...	...	13' 6	1 5
20	5' 8	1' 2	...	6' 4	2' 6	...	...	2' 8	2' 8	...	0' 8	1' 8	...	8' 5	10 30
21	2' 0	4' 8	...	0' 9	4' 5	...	...	4' 2	4' 2	...	2' 7	4' 1	...	10' 6	22 25
22	3' 2	...	0' 6	6' 6	4' 4	...	...	3' 5	8' 5	...	7' 6	3' 1	...	14' 5	22 40
23	8' 5	5' 7	...	6' 5	6' 5	...	...	3' 3	3' 3	...	4' 3	1' 7	...	15' 6	0 15
24	4' 1	2' 7	...	4' 8	1' 0	...	...	2' 4	1' 0	...	3' 6	2' 4	...	9' 4	23 40
25	5' 1	1' 0	...	3' 5	0' 7	...	...	4' 2	0' 8	...	Calm	...	...	9' 0	0 10
26	Calm	...	2' 3	0' 4	...	3' 5	0' 7	...	1' 7	1' 1	...	6' 0	15	40	
27	2' 4	1' 0	...	1' 6	...	3' 4	...	5' 2	2' 5	...	2' 5	1' 7	...	13' 2	13 25
28	1' 2	5' 8	...	0' 4	2' 3	...	...	0' 6	3' 2	...	8' 3	1' 0	...	6' 4	7 35
29	Calm	...	2' 7	2' 7	...	3' 3	...	...	3' 3	...	...	6' 4	7	35	
30	2' 0	...	2' 3	...	3' 3	...	...	Calm	...	...	5' 5	13	15		
31	3' 0	...	5' 8	...	7' 4	...	2' 9	...	6' 9	...	17' 0	14	5		
S+N & W+E	117' 9	84' 7	127' 1	95' 3	119' 7	88' 7	105' 6	80' 2							
S-N & W-E	-80' 1	22' 5	-89' 5	35' 5	-73' 9	28' 5	-68' 0	28' 4							

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1' 5 m., Ground 4' 9 m., M.S.L. 57' 3 m.

Day.	3 h.			9 h.			15 h.			21 h.			Vel. in Max. Hourly Run.	Time of Max.	
	S.	N.	W.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.		
1	...	6' 9	...	...	2' 9	...	...	...	9' 4	3' 9	...	3' 3	...	1' 4	1' 6
2	0' 9	...	...	...	1' 3	...	...	1' 7	...	2' 5	3' 8
3	...	5' 2	...	...	2' 1	...	...	...	4' 5	...	...	3' 2	...	3' 0	...
4	...	3' 6	...	...	6' 2	...	...	...	6' 2	...	...	7' 2	...	6' 5	...
5	...	5' 2	...	...	2' 1	...	...	...	6' 1	...	...	5' 6	...	5' 2	...
6	4' 8	2' 0	...	2' 8	...	6' 9	...
7	...	1' 6	...	...	1' 6	...	...	...	1' 6	...	...	2' 4	...	4' 3	...
8	...	1' 6	...	...	1' 6	...	...	...	1' 6	...	...	2' 0	...	5' 9	...
9	...	1' 1	...	...	1' 1	...	...	...	1' 1	...	...	1' 0	...	8' 2	...
10	...	1' 0	...	...	1' 0	...	...	...	1' 0	...	...	1' 0	...	12' 5	11
11	...	1' 5	...	...	1' 5	...	...	...	1' 5	...	...	1' 5	...	9' 8	17
12	...	1' 6	...	...	1' 6	...	...	...	1' 6	...	...	1' 6	...	11' 8	9, 10
13	...	1' 7	...	...	1' 7	...	...	...	1' 7	...	...	1' 7	...	4' 3	...
14	...	1' 8	...	...	1' 8	...	...	...	1' 8	...	...	1' 8	...	8' 2	...
15	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...	8' 5	...
16	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...	8' 6	...
17	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...	8' 7	...
18	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...	8' 8	...
19	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...	8' 9	...
20	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...	8' 10	...
21	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...	11' 8	23
22	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
23	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
24	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
25	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
26	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
27	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
28	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
29	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
30	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
31	...	1' 9	...	...	1' 9	...	...	...	1' 9	...	...	1' 9	...		
S+N & W+E	87' 4	77' 6	III' 4	79' 5	II9' 6	106' 3	83' 9	86' 3							
S-N & W-E	-84' 6	58' 8	-90' 8	29' 1	-94' 8	54' 3	-72' 1	57' 7							
S+N & W+E	55 4	70' 4	73' 5	87' 4	88' 0	97' 6	81' 2	76' 7							
S-N & W-E	-25' 2	64' 9	-51' 1	64' 4	-18' 4	33' 4	-5' 4	27' 1							

ENGLAND E.:—SHOEBURYNESS.*

Height of Head above—Ground 27' 4 m., M.S.L. 31' 4 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.	
	S.	N.	W.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.		
1	...	3' 0	0' 4	1' 8	3' 9	1' 2	...	7' 9	17 15
2	...	Calm	2' 1	3' 1	1'						

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ.	Remarks.	
				A _{N.}	A _{E.}	A _{Z.}			
4	L F	h m s	s	μ	μ	μ	km.		
		14 3 30	18	...	...	...
4		14 24	...	...	...	...
4		23 30 to	...	...	...	...	Faint disturbance.	
		24 0	...	...	...	...
6	O P S L M _e F	7 4 23	...	...	...	...	8500	
		7 16 10	...	...	...	...
6		7 25 56	...	...	...	...
		7 41 45	...	...	...	...
6	M _e F	7 45 33	22	...	13	...			
		8 18	...	...	...	...
6		14 48 to	...	...	...	...	Slight disturbance, with long waves of 19 seconds period at 15 h. 16 m.	
		16 5	...	...	...	...
8	O P PR ₁ PR ₂ S L M _n M _n F	...	...	...	...	...	7660 P marked on both horizontal components with unusual sharpness. Azimuth of epicentre 140° or 326°, indeterminate owing to absence of vertical record. Anti-epicentral waves well marked.	
		21 16 25	...	...	...	...
8		21 19 16	...	...	...	...
		21 20 41	...	...	...	...
8		21 25 28	...	...	...	...
		21 39	...	...	...	...
8		21 41 39	24	59	...	...	
		21 49 36	21	75	...	...	
8		1 15	...	...	...	...
9		19 43 to	...	...	...	...	Slight disturbance. P probably at 19 h. 42 m. 22s.	
		20 30	...	...	...	...
11	P (?) L F	0 51 20	...	...	...	...
		1 5	...	...	...	...
12	i _e L F	22 32 21	16	...	...	...
		22 37	...	...	...	...
12		23	...	...	...	...
14		13 52 to	...	...	...	...	Prolonged slight disturbance. No noticeable preliminary phases. Chiefly groups of long waves of 17 seconds period.	
		15 30	...	...	...	...
16		4 31	...	...	...	...	Slight disturbance. L probably at 4 h. 51 m.	
		5 22	...	...	...	...
17		10 30 to	...	...	...	...	Slight disturbance.	
		11 7	...	...	...	...
17	L F	16 56	...	...	...	...
		17 30	...	...	...	...
18		17 12 to	...	...	...	...	Slight disturbance. L probably at 7 h. 18 m.	
		7 33	...	...	...	...
22		22 23 to	...	...	...	...	Slight disturbance. Well-marked groups of long waves of 16 seconds period at 22 h. 47 m. to 22 h. 52 m. on E.-W. trace.	
		23	...	...	...	...
24	O P S SR ₁ L M _n F	2 3 25	...	...	...	...
		2 12 50	...	...	...	...
24		2 20 21	...	...	...	...
		2 24 27	...	...	...	...
24		2 38 22	18	44	...	...	
		3 51	...	...	...	...

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	0 h.		6 h.		12 h.		18 h.	
	A _{N.}	T.	A _{N.}	T.	A _{N.}	T.	A _{N.}	T.
1	μ	s	μ	s	μ	s	μ	s
2	0'9	4'5	1'0	4	1'0	4	1'0	4
3	0'3	4	0'3	3	0'1	3'5	0'3	3'5
4	0'1	2'5	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...
6	0'1	4	0'1	3	0'0	0	0'1	3
7	0'1	4	0'1	4	...	...	0'1	4
8	0'0	0	0'2	4	0'0	0	...	...
9	...	...	...	...	...	...	...	...
10	0'1	4	0'3	4	0'2	4	0'6	4
11	0'8	4	0'9	5	0'6	4	0'9	4
12	0'8	4	1'0	4	1'1	4	0'9	4
13	0'8	4	0'2	4	0'9	4	0'3	4
14	0'5	4	0'2	4	0'2	4	0'1	3
15	0'5	4	0'3	4	0'2	4	0'3	3'5
16	0'2	4	0'2	4	0'7	4	0'7	5'5
17	1'0	4'5	1'0	4'5	0'7	5	0'6	4'5
18	0'9	4	0'7	4	...	...	...	...
19	0'1	4	0'1	3'5	0'3	2'5	0'1	3
20	0'1	4	0'0	0	0'1	4	0'1	4
21	0'2	4	0'1	4	0'1	4	0'3	3'5
22	0'2	4	0'2	4	0'3	2	0'1	3'5
23	0'2	4	0'2	4	0'1	4	0'3	3'5
24	0'4	3	0'1	4	0'1	4	0'1	4
25	0'3	4	0'3	3'5	0'9	4	1'0	4
26	0'7	4	0'3	4	0'5	4	0'6	4
27	0'3	4	0'1	3'5	0'4	3'5	0'3	4
28	0'3	3	0'3	3	0'0	0	0'0	0
Means for Month $\left\{ \begin{array}{l} A_N = 0'3 \\ T = 3'0 \end{array} \right.$								
Normals, 1911-18 $\left\{ \begin{array}{l} A_N = 0'3 \\ T = 4'4 \end{array} \right.$								
EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).								
Day.	Times, G.M.T. of			Remarks.				
	Commencement.	Max. Phase.						
4	h m	h m	23 41	Small.				
8	21 25	21 49		Amplitude on trace 1'4 mm.				
12	...	22 39		Small.				
14	...	14 42		Succession of small waves.				
17	...	10 41		Small.				
17	...	17 9		Small.				
22	...	22 45		Very small.				
24	2 23	2 33						

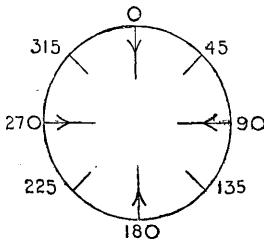
10. SOUNDINGS WITH PILOT BALLOONS.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.												Cloud Observations.							
		Geostrophic.		By Anemometer.		At Heights above M.S.L.								Time, G.M.T. h. m.		Type.		Deg. from N. m/s.	Type.	Deg. from N. m/s.	
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.				Deg. from N.	m/s.	Type.	Deg. from N. m/s.
						Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.						
ABERDEEN.																					
8	17 0	?	?	80	2.0	360	6.0	360	6.0	360	4.5	18 0	Ci.	70 2.0
16	7 30	270	5	calm		290	2.5	230	4.5	260	9.5	265	11.0	Ci-St.	...
21	7 30	315	5	295	6.0	310	14.5	320	13.5	260	3.0	...	...	...	...	13 0	St-Cu.	230 5.0	A-Cu.	235 3.0
																13 0	Ci-Cu.	160 2.5
ESKDALEMUIR.																					
7	17 25	?	?	205	1.0	235	2.7	350	3.8	45	2.6	15	2.3	85	4.2	...	Cu.	350
8	11 45	?	?	60	5.5	20	3.8	25	5.0	65	2.2	25	4.0	60	5.0	11 10	Cu.	20	...	Ci.	95 1.5
8	17 20	?	?	70	4.0	40	5.5	15	6.5	20	5.0	...	...	17 15	Cu.	70	...	Ci.	85 1.5	
9	7 50	350	7	80	0.5	230	1.6	320	2.6	340	6.0	345	9.5	355	9.0	8 30	...	...	Ci-St.	5 2.5
10	17 40	330	5	300	7.5	300	4.5	285	4.0	355	2.0	305	4.8	340	5.0	...	...	...	Ci.	...
																	
11	17 35	280	7	270	7.0	260	11.0	260	16.0	265	18.0	...	...	...	...	Cu., Fr-Cu.	270	...	A-Cu., Ci.	250 3.5
12	7 15	315	6	290	5.5	295	10.0	300	8.0	315	14.0	7 45	Fr-Cu.	295	...	Fr-Ci.	200 6.5
12	12 10	335	7	315	8.0	305	14.5	315	7.0	320	11.0	12 30	Cu-Nb.	335 5.5
12	17 25	340	7	355	5.5	350	3.9	345	8.0	320	6.5	...	...	...	...	Cu-Nb.	...	...	...	...
14	11 45	320	8	315	3.5	305	1.8	330	4.0	340	14.0	...	...	...	...	Cu.	...	...	...	...
																	
15	12 15	30	5	360	0.3	355	2.2	310	3.0	355	8.5	...	...	...	...	12 0	Cu.	320 4.5	Ci.	345 3.5
15	17 35	270	5	190	5.5	220	4.9	260	4.9	320	9.0	...	...	...	...	17 15	Cu.	...	Fr-Cu.	320 2.0
21	17 35	340	7	265	6.5	275	8.5	265	11.0	275	20.0	...	...	...	...	17 30	Cu-Nb.	270 7.0	A-Cu.	270 7.0
25	12 5	?	?	40	4.5	40	6.5	10	4.8	360	8.0	15	8.0	...	...	Fr-Cu.	25	...	...	...
26	18 5	45	5	60	4.9	50	5.0	360	3.4	300	7.0	325	11.5	...	...	18 30	Cu.	...	A-Cu.	315 4.0
																	
29	7 20	360	8	10	0.6	5	7.0	10	10.5	20	7.5	50	12.0	40	16.5	7 0	Cu.	20 11.5	Ci.	45 2.5	
29	11 50	360	7	50	4.6	30	3.2	15	4.1	40	6.5	30	10.0	30	9.5	...	Cu.	30	...	Ci-St.	25 ...
29	17 40	360	5	75	1.5	125	2.7	230	1.3	305	5.5	320	7.0	...	...	St-Cu.	340	...	...	...
30	7 15	315	5	calm		250	4.2	260	5.5	280	7.5	...	...	...	...	Fr-St.	255	...	Ci.	...
30	17 30	315	6	280	4.5	290	4.9	255	5.0	305	7.5	285	15.0	325	2.2	...	...	...	cloudless	...
7	17 25			(For observations at lower levels, see above.)												5000 m.	6000 m.				
10	17 40															110	5.5	...	Cu.	350	...
29	7 20															345	7.0	...	Ci.
29	11 50															35	16.0	...	Ci.	20 11.5	...
30	17 30															20	11.5	...	Ci-St.	30	...
																340	3.1	...	cloudless
SOUTH FARNBOROUGH.																					
3	6 40	270	10	260	7.0	295	8.0	280	10.5	270	12.0	...	...	...	...	St-Cu.	...	A-Cu.	...	...
4	6 35	225	7	180	2.0	210	3.0	225	6.0	225	6.5	...	...	...	...	A-Cu.	230	Ci., Ci-Cu.	...	...
9	6 30	350	6	calm		330	6.5	355	6.0	355	8.5	Ci., Ci-St.	...
10	6 35	340	5	335	3.3	15	5.5	330	6.0	260	6.5	10	5.5	15	9.0
11	6 30	?	?	300	1.4	305	7.0	325	6.5	345	5.5	30	8.5	...	...	A-Cu.	...	Ci.	340	...
																	
14	7 30	320	10	315	9.0	295	8.5	295	9.5	315	13.5	...	...	...	...	Nb.	...	A-Cu.	...	...
15	7 0	360	12	335	4.5	350	11.0	360	13.5	345	17.5	...	...	...	...	St-Cu., A-Cu.	...	Ci-St., Ci-Cu.	...	...
16	10 10	270	4	225	2.7	260	5.5	270	4.5	325	8.0	335	8.5	...	...	Cu.	...	Ci-Cu.	...	...
21	6 35	300	16	295	8.0	300	10.0	300	11.0	295	14.0	300	15.5	300	16.5	A-St.	...	...	...	...
22	18 20	315	9	205	5.5	315	5.0	305	8.5	315	14.5	...	...	...	...	Cu.	...	...	...	...
																	
26	8 0	360	4	15	1.3	15	2.8	5	11.5	340	11.0	340	7.5	345	9.0	...	Fr-St.
28	6 30	?	?	360	1.5	355	8.0	340	8.5	355	8.0	360	8.5	355	3.7	St-Cu., Cu.	...	A-Cu.	...	...
31	6 25	250	5	calm		285	2.2	75	2.8	330	5.5	40	4.4	355	3.7
																	
10	6 35			(For observations at lower levels, see above.)												5000 m.	6000 m.	7000 m.	8000 m.	9000 m.	
21	6 35					15	8.5	20	11.0	A-St.
26	8 0					305	14.0	305	19.5	Fr-St.
31	6 25					340	12.0	335	16.0
						25	4.4	10	8.5	5	8.0	5	7.0	5	7.5

height of Station above M.S.L. = H.,
anemometer above ground = h.

WATER ABOVE GROUND - II.

		H.	H.
berdeeen	.	14 m.	32 m.
arkdalemuir	.	242 m.	15 m.
Farnborough	.	70 m.	31 m.
hirciveen	.	9 m.	12 m.



Notes on Pressure Distribution.

Throughout the whole month there was an extensive anticyclone over the Azores region which oscillated to the north and east.

July 1919.

- 3 7 h. Low centred near Spurn Head.
- 4 7 h. Shallow Low over England.
- 6th–17th. High over the British Isles.
- 20 7 h. } Shallow Low over the North Sea.
- 22 18 h. }
- 23th–31st. High over the British Isles.

Notes on Ascents

Aberdeen—
8th, 17 h. True Cirrus in bands having
a radiating point in ESE.

16th, 7 h. 30 m. At 7 h. there was $\frac{1}{10}$ ths of hazy Ci-St., with solar halo, but after 8 h. 30 m. a rapid growth of

21st, 7 h. 30 m. Upper sheet of closed cloud opening out into Ci-Cu. showing fine example of straight edge to cloud layer, edge lying S.E.-N.W. The continued backing of air currents as compared with that at 1 km. is noteworthy.

Eskdalemuir—

9th, Solar halo at 8 h.
12th, 17 h. 25 m. Visibility good.
15th 17 h 25 m. Ci-Cu changing

15 mi., 17 m. 35 mi.
during flight

S. Farnborough—
10th, 6 h. 35 m. Misty, sharp temperature inversion between 2000 and 2500 m.
31st, 6 h. 35 m. Misty up to 1680 m.

accord

Cahirciveen—
9th, 11 h. 50 m. Atmosphere exceptionally clear.
25th, 7 h. 40 m. Atmosphere very clear.

10. SOUNDINGS WITH PILOT BALLOONS—continued.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.										Cloud Observations.							
		Geostrophic.		By Anemometer.		At Heights above M.S.L.						Time, G.M.T. h. m.		Type.		Deg. from N.	Type.	Deg. from N.	
		Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Time, G.M.T. h. m.	Type.	Deg. from N.	Type.	Deg. from N.			
CAHIRCIVEEN.																			
3	16 50	360	7	360	7.0	30	4.1	55	3.7	75	6.0	...	...	...	Cu.	360	A-Cu.	90	
4	7 40	20	6	25	5.5	25	10.0	25	11.5	30	14.5	40	3.2	...	Cu-St.	25	A-St., A-Cu.	360	
6	7 20	?	?	50	6.5	55	6.0	60	7.0	55	9.5	70	9.5	50	9.0	A-Cu.	5	Ci-St.	335
7	7 50	?	?	calm		315	1.4	45	0.1	50	5.5	...	...	...	Cu.	...	Ci.	45	
9	7 10	?	?	calm		360	1.4	280	1.2	60	3.2	85	6.0	75	7.0	St-Cu.	25	...	50 2.0
9	11 50	?	?	360	7.0	30	3.0	35	3.7	60	2.7	80	5.0	75	4.2	Cu.	65	Ci.	65 3.0
10	12 25	?	?	340	10.5	35	3.8	350	7.0	345	6.0	350	7.0	10	7.0	Cu.	360	Ci-Cu.	45
12	12 30	?	?	350	10.5	350	9.0	360	9.0	335	13.0	...	...	...	Cu.	360	...	...
12	16 40	360	9	350	10.0	355	12.0	360	10.5	345	16.0	340	16.5	...	Cu.	360	...	Ci. 335	
13	7 20	330	13	325	4.3	320	7.0	335	4.3	320	11.5	325	13.5	...	Cu.	360	Ci., Ci-Cu.	340 3.5	
17	17 15	250	11	230	5.5	245	4.9	245	8.5	235	11.5	250	12.5	245	11.5	...	...	...	...
20	7 40	285	8	300	4.6	305	6.0	305	7.0	310	9.0	300	10.5	...	Cu.	315	...	...
22	17 10	315	6	335	6.0	5	7.0	345	9.0	325	20.0	...	...	...	Cu.	360	Ci-Cu.	315	
25	7 40	225	5	65	6.5	20	4.7	30	4.0	25	9.0	20	9.0	10	7.0	Cu.	45	...	...
25	11 45	225	4	75	3.8	120	0.6	55	4.9	40	7.5	10	4.0	355	6.0	Cu.	115	...	...
26	17 10	?	?	275	4.3	235	1.8	225	2.8	285	2.5	325	5.0	350	6.5	Cu.	270	...	...
29	7 50	?	?	calm		...	...	55	3.5	55	2.3	50	5.0	20	5.5	Cu.	45	A-Cu.	...
30	12 15	?	?	260	3.0	245	1.9	195	3.9	185	4.6	165	4.0	...	Cu.	180	...	...
										5000 m.	6000 m.	7000 m.	8000 m.						
6	7 20	(For observations at lower levels, see above.)										50	12.0	...	...	...	...	Ci.	45
9	7 10									65	10.5	...	...	...	...	St-Cu.	45	...	50 2.0
9	11 50									65	7.5	45	7.5	55	8.0	Cu.	65	Ci.	65 3.0
0	12 25									20	11.0	...	...	...	...	Cu.	360	Ci-Cu.	45
9	7 50									50	7.0	50	8.0	70	130	Cu.	45	A-Cu.	...

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN.

Day and Hour, G.M.T.	Type of Cloud.	Velocity-height-ratio.						Remarks.	
		Degrees from N.	Milliradians per Second.	Components.					
				W.-E.	S.-N.	mr/s.	mr/s.		
1 18	Ci-Cu.	35	4.2			- 2.4	- 3.4	Coarse Ci. to Ci-Cu., fused to A-Cu. later. Formed rapidly	
2 13	A-Cu.	60	5.5			- 4.8	- 2.8	Incipient flat A-Cu. [at 18 h.]	
8 18	Ci.	70	2.0			- 1.9	- 0.7	True Ci. R-pt. E.S.E. ⊕ afternoon.	
9 13	Ci.	30	2.2			- 1.1	- 1.9	St-Cuf. below, moving from 310° approximately. Ci. of	
11 15	{ Ci.	230	1.7	+ 1.3	+ 1.1	+ 1.1	+ 0.7	Very slight traces of Ci. [coarse type.]	
	Cu.	262	5.2	+ 5.2	+ 0.7				
14 13	Cu.	335	11.0	+ 4.6	- 9.7			Slight small Cu.	
15 13	Ci.	350	2.7	+ 0.5	- 2.7			True Ci. R-pt. N., rapidly increasing in quantity.	
16 13	{ A-Cu.	233	3.1	+ 2.5	+ 1.9			Ci-Cu. to high A-Cu., with lower layer of St-Cu.	
16 18	St-Cu.	232	5.0	+ 3.9	+ 3.1			Ci-Cu. to A-Cu.	
17 13	{ Ci-Cu.	230	2.2	+ 1.7	+ 1.4				
	Ci.	285	1.7	+ 1.6	- 0.4			Hazy Ci-Cu. in lenticular patches, eventually fused into	
	Cu	255	4.2	+ 4.1	+ 1.1			A-St. opening into fine Ci-Cu. in long perfectly straight bands.	
18 13	Ci, Cu.	217	1.5	+ 0.9	+ 1.2			Also some slight Ci-Cu. low in E., moving from about 25°.	
21 13	Ci, Cu.	161	2.5	- 0.8	+ 2.4				
29 13	Cu.	330	7.9	+ 3.9	- 6.8				

12. AURORA.

None reported.

METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—*Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.*

Ninth Year.—No. 8. AUGUST 1919.]

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1. SUNSHINE AND SOLAR RADIATION.

Day.	WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.						RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.						ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.						CAHIRCIVEEN.	
	Bright Sunshine.*		Radiation received on Horizontal Surface by Callendar Radiograph.						Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.			Bright Sunshine.*		Radiation by Ångström Pyrheliometer.			Bright Sunshine.*		Bright Sunshine.*	
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.		For Day.	11.30 h. to 12.30 h.	Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	p sec Z.	Intensity.	Total.	Per cent. of Possible.	
1	hr.	%	j/cm².	%	mw/cm².	h.	m.	mw/cm².	hr.	%	...	...	...	hr.	%	h.	m.	...	...	hr.	%
1	7.4	48	1729	47	82	13	4	79	7.8	51	...	...	...	0.4	3	...	...	...	...	0.1	0
2	7.1	46	1510	41	76	13	0	69	8.0	52	...	...	...	8.3	52	...	...	...	...	0.0	0
3	6.8	44	1428	39	x 84	13	30	55	6.8	45	...	...	...	1.2	8	...	...	...	...	7.5	49
4	2.5	16	1103	30	81	10	38	46	1.9	13	...	...	...	0.0	0	...	...	...	...	0.0	0
5	1.3	8	855	24	63	11	8	25	0.3	2	...	...	...	8.0	51	...	...	...	...	8.2	54
6	11.0	73	2009	56	73	12	25	73	10.4	69	...	...	...	9.4	61	...	...	...	...	8.1	54
7	11.0	73	1559	44	76	14	12	34	9.4	62	...	...	...	x 12.1	83	12 20	Clear	1.27	95	10.2	67
8	13.2	88	x 2106	59	75	12	40	72	13.1	87	72	59	Clear	0.2	1	...	...	...	...	11.0	73
9	x 13.3	89	2095	59	75	11	59	75	x 13.3	89	75	61	Clear	9.6	62	12 21	Ci.	1.28	87	1.6	11	
10	12.6	85	1928	55	73	13	6	67	12.0	81	...	...	...	7.3	48	...	...	...	...	8.9	59
11	13.2	90	2066	59	71	12	22	71	12.9	87	65	52	Clear	2.9	19	...	...	...	...	6.6	44
12	11.5	78	1837	53	66	11	48	66	11.3	77	...	...	...	8.3	55	...	...	...	...	3.6	24
13	11.8	81	2052	60	76	13	16	73	12.2	83	77	62	Clear	1.7	11	...	...	...	...	8.0	54
14	10.3	71	1754	51	81	11	50	x 81	11.1	76	74	59	Clear	8.3	55	12 21	Ci.-St.	1.31	101	9.9	68	
15	9.8	67	1767	52	67	10	15	65	10.1	70	70	55	Hazy	9.9	66	...	...	...	...	4.2	29
16	7.5	52	1620	48	75	12	35	74	7.3	51	57	45	Ci.	4.7	31	...	...	...	...	x 12.1	83
17	11.4	79	1828	55	75	12	35	74	11.0	76	...	...	...	8.5	57	...	...	...	...	2.0	14
18	7.0	49	1582	48	80	11	20	76	5.8	41	75	59	Clear	9.8	66	...	...	...	...	3.9	27
19	0.2	1	n 456	14	41	11	40	41	0.3	2	...	...	...	5.2	35	...	...	...	...	6.4	44
20	0.1	0	465	14	38	17	15	20	0.1	1	...	...	...	3.5	24	...	...	...	...	8.5	60
21	11.0	77	1781	55	83	12	40	80	10.9	76	77	60	Clear	9.5	65	...	...	...	...	10.3	72
22	5.6	39	1220	38	79	12	30	79	6.0	42	...	...	...	3.5	24	...	...	...	...	0.0	0
23	4.4	31	1112	35	67	11	25	66	3.9	28	...	...	...	0.5	3	...	...	...	...	1.3	10
24	2.5	18	895	28	76	12	10	76	2.9	21	...	...	...	6.6	46	...	...	...	...	2.7	19
25	0.3	0	570	18	48	11	15	32	0.5	3	...	...	...	0.0	0	...	...	...	...	0.2	1
26	5.9	43	1125	36	80	12	20	80	6.2	45	65	49	Ci.	0.1	1	...	...	...	...	6.2	44
27	8.6	62	1489	48	77	11	30	77	8.9	64	71	53	Clear	2.7	19	...	...	...	...	8.2	59
28	0.6	5	465	15	38	14	32	28	0.6	5	...	...	...	0.0	0	...	...	...	...	0.0	0
29	2.2	16	621	21	68	11	2	15	2.3	17	...	...	...	6.6	56	...	...	...	...	10.3	75
30	9.8	72	1504	52	80	11	25	78	9.3	68	...	...	...	4.7	47	...	...	...	...	1.1	10
31	10.0	74	1693	57	81	12	55	77	10.2	75	...	...	...	8.5	61	...	...	...	...	5.9	43
Means	7.42	52	1429	43	71	—	—	62	7.32	51	—	—	—	5.23	36	—	—	—	—	5.39	37	
Normal	5.48	38	1198	36	—	—	—	—	6.03	42	—	—	—	4.32	29	—	—	—	—	5.00	35	
			← 35 years →			7 years			← 35 years →			← 5 years →		← 5 years →			← 35 years →				← 35 years →	

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9.1 m. H_b = 13.7 m. H_a = 26.4 m. Above Ground: h_t = 1.3 m. h_r = 0.56 m. h_a = 13.9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0–10) and Weather.		Rain	Min. Temp. on Grass.	REMARKS.			
	9 h.		21 h.		9 h.	21 h.	Vapour Pressure.	Percentage.	9 h.	21 h.	9 h.	21 h.	0 h. to 24 h.	mm.	a.	Magnetism. Horizontal Force, Declination West, and Inclination.		
	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h. to 24 h.	mm.	200+			
1	mb.	mb.	200+	200+	a.	a.	millibar.	%	285	3	290	2	9	10	0.7	85	o. n. o. and d. day. d. evening.	
2	1024.0	1025.5	89.1	88.1	91	87	15.2	16.7	84	98	270	3	10	7	1.5	88	d. n. o. and d. day. c. evening.	
3	1024.4	1024.6	89.2	87.4	90	87	17.3	14.0	95	86	340	3	9	9	—	84	Fair n. and day. o. evening.	
4	1017.4	1017.0	89.0	87.4	91	87	17.1	15.3	95	94	265	4	10	9	1.9	88	• 0 n. o. and p. day.	
5	1018.3	1021.5	88.2	86.9	91	86	14.9	13.8	87	88	345	4	5	7	0.3	—	o. and d. n. Fair day.	
6	1022.4	1023.7	87.1	87.4	90	86	13.7	14.2	86	87	340	4	10	7	—	—	♦ n. Fine day. Fair evening.	
7	1023.8	1023.4	89.9	87.0	91	83	15.5	14.4	81	91	—	0	6	5	0.1	n 78	—	
8	1020.2	1016.8	87.6	88.6	x 95	85	15.1	14.7	92	84	65	2	1	4	0.1	81	—	
9	1016.4	1019.3	90.1	89.7	93	87	16.8	17.4	87	92	70	2	10	7	—	81	o. and ∞ morning. Fair to fine day. ⊕	
10	1022.0	1024.3	91.4	89.3	93	87	17.6	15.8	84	86	—	1	8	9	—	83	o. morning. Fair to fine day. [P]	
11	1025.7	1025.8	90.2	87.4	92	85	15.4	14.2	79	87	—	0	9	—	—	86	o. and ∞ morning. Fine day.	
12	1024.5	1022.8	90.7	90.7	94	84	17.7	18.1	88	90	155	3	215	2	8	82	o. morning. Fair day.	
13	1021.5	1021.3	91.8	91.0	94	x 90	20.0	18.6	93	91	220	4	1	10	7	0.3	87	c. to o. and p. n. and morning. Fair p.
14	1020.2	1019.9	91.6	90.4	95	88	20.0	17.9	94	91	240	2	190	2	8	88	c. to o. and p. morning. Fair p.	
15	1015.7	1011.3	92.0	91.1	95	88	17.4	18.9	80	92	275							

3. METEOROLOGY:—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28'$ N. Long. $0^{\circ} 19'$ W.Heights above Mean Sea Level:—Rain-gauge Site, H = 5.5 m. Barometer, H_b = 10.4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.				
							Vapour Pressure.	Percentage.	9 h.	21 h.	9 h.	21 h.							
	9 h.	21 h.	9 h.	21 h.	Max.	Min.							Tenths of Sky covered.	mm.	200+				
1	mb.	mb.	200+	200+	200+	200+	nullibar.	%	%	m/s.	m/s.	6	8	0.3	86	Dull in a. Fine to fair at n.			
2	1019.1	1020.1	90.7	91.9	97	88	15.9	14.9	79	230	5	290	3	0.3	84	Fair to fine to dull. \bullet p. 20 h.			
3	1019.9	1017.2	92.5	91.9	98	86	16.2	17.8	72	270	3	280	2	0.3	78	Overcast to fair and v. in a. Fine p.			
4	1017.9	1012.2	89.2	89.5	94	85	12.3	15.8	67	270	2	220	3	6	9	Fair to fine, then dull. \bullet p. 18 h. 45 m.			
5	1011.9	1017.2	90.5	88.8	93	86	14.9	14.0	75	350	3	10	2	0	81	Dull in a., to fair in p. ∞^0 in p.			
6	1019.5	1017.9	87.5	91.5	97	83	14.4	14.5	88	69	—	330	3	0	78	\equiv early. Fine from 9 h., with ∞ .			
7	1020.9	1021.8	88.2	86.9	93	85	11.3	12.7	66	330	4	—	0	5	77	Fine to fair. Dull to 14 h., then fine.			
8	1021.8	1019.9	89.4	92.3	100	84	12.4	14.0	67	290	2	—	1	4	77	Fine all day, with ∞ .			
9	1019.4	1019.4	93.8	93.6	2102	85	14.1	14.9	58	200	2	200	2	0	79	Very fine all day.			
10	1020.2	1020.2	93.8	94.9	101	86	13.3	14.6	55	230	2	300	2	1	80	Fine all day. ∞^0 in a.			
11	1024.1	1024.3	91.5	93.0	100	87	13.3	16.2	63	350	2	—	1	0	81	Fine all day, with ∞^0 .			
12	1025.0	1021.3	93.1	92.9	102	86	16.5	15.4	71	67	—	1	0	5	80	\equiv early. Fine all day, with ∞^0 .			
13	1020.3	1019.0	93.3	93.9	100	87	14.2	15.2	60	62	230	2	280	2	3	81	Fine all day. ∞^0 in a. v. in p.		
14	1019.5	1021.8	92.6	91.1	99	88	16.3	14.0	72	68	260	3	60	4	8	82	Fine and ∞^0 in a. Fine to fair p.		
15	1022.6	1018.7	91.1	92.6	100	87	14.2	13.1	69	58	110	2	160	2	0	84	Fine early. Overcast 6 h.—7 h. 30 m., then fine.		
16	1015.4	1018.0	94.0	93.5	98	89	16.5	16.0	67	240	4	260	2	3	84	Cloudy to 6 h. 45 m., then fine to fair.			
17	1023.2	1021.9	92.6	92.9	99	88	15.3	16.3	68	71	270	3	210	4	3	82	Fine all day.		
18	1018.4	1016.7	93.1	93.0	97	89	13.8	18.5	59	80	200	9	220	5	4	86	Fine a. Overcast p.		
19	1012.6	1012.8	93.2	92.0	96	292	18.5	19.8	79	91	210	7	220	4	10	1.4	90	\bullet p. early. Dull all day. \bullet at n.	
20	1009.4	1013.0	92.4	89.1	93	89	20.1	16.1	90	89	200	7	250	2	10	5.8	90	\bullet on and off to 14 h. 30 m. Dull.	
21	1017.4	1021.3	89.2	88.6	93	85	13.0	12.0	71	68	260	2	280	2	7	83	Fine all day, with v.		
22	1021.3	1020.1	88.9	89.2	95	82	13.4	13.7	75	75	230	5	250	3	10	76	Overcast to fair to 11 h. Fine later.		
23	1020.7	1018.6	90.5	90.6	93	86	15.0	14.5	76	73	240	4	—	6	10	81	Fine to fair and ∞ in a. Dull p.		
24	1017.9	1017.5	86.6	86.5	92	86	13.9	13.0	90	85	—	1	0	10	1.8	85	\bullet early. Dull to 11 h. 45 m., then fine.		
25	1013.7	1002.5	88.1	89.2	93	86	12.9	15.9	76	87	180	5	180	4	10	1.3	82	\bullet early and at n. Dull to fair all day.	
26	992.7	993.2	91.0	87.2	95	86	15.7	11.1	77	69	230	5	230	6	9	6.7	86	\bullet early and at n. v. in p. Gusts 17 h. 15 m.	
27	999.0	1006.7	87.1	85.5	91	81	9.5	10.0	59	69	250	7	270	2	7	82	Fine to fair in a. Fine and v. in p.		
28	997.9	996.1	86.7	90.3	93	n 80	14.6	16.0	94	82	100	4	210	5	10	227.1	n 74	\bullet early and at n. Dull to fair.	
29	1003.5	1007.7	87.1	83.0	n 89	83	13.1	10.6	82	87	230	3	330	3	6	10	6.7	84	\bullet early and at n. Fine to fair, then dull.
30	1012.4	1010.6	84.6	84.7	89	81	9.2	12.0	68	88	270	5	230	2	4	10	0.8	78	Fine to fair, then dull. \bullet at n.
31	1010.2	1016.3	85.8	85.1	90	82	11.4	10.7	78	76	360	4	350	2	8	10	3.4	82	\bullet early. Fine most of day.
Means	1015.7	1015.6	90.2	90.1	95.6	85.6	14.0	14.3	72	74	3.6	2.4	5.5	4.4	54.7	81.7	Monthly Totals or Means.		
Normal	1014.2	1014.1	89.6	88.8	94.1	85.1	13.9	14.1	75	80	3.5	2.5	—	—	56.6	—	Normals.		

4. METEOROLOGY:—ESKDALE MUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19'$ N. Long. $3^{\circ} 12'$ W.Heights above Mean Sea Level:—Rain-gauge Site, H = 242 m. Barometer, H_b = 237.3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Vane of Anemometer, H_a = 15 m.

I	988.2	987.5	85.0	86.4	88	84	11.5	13.4	83	88	260	5	270	8	10	10	0.6	83	REMARKS.
1	985.6	987.1	87.8	83.3	90	82	14.2	9.9	85	77	260	8	270	4	10	10	0.6	84	d. \equiv early. o. a. d. \equiv p. d. \equiv to o. n.
2	988.6	989.7	84.5	82.9	89	82	9.5	9.5	71	79	290	8	280	6	8	2	—	80	d. \equiv at first. c. a. c. v. p. o. p. n.
3	985.6	983.4	83.8	85.2	87	80	11.3	13.6	88	96	200	5	—	0	10	9	2.9	76	b. i. h. d. \equiv 9 h. 17 h., then o. to c.
4	987.2	989.4	87.8	87.3	94	83	12.2	10.0	73	62	—	0	280	3	10	2	—	83	o. at first. b. c. a. b. c. ∞ p. b. n.
5	988.8	991.4	87.4	84.0	91	82	11.7	9.8	72	75	280	5	190	3	8	4	0.2	79	b. i. h. d. 5 h. c. a. b. c. y. p. b. n.
6	991.9	993.7	87.1	86.3	92	84	10.4	9.3	65	61	320	7	230	3	3	4	—	80	Very fine. v. a. q. p.
7	992.7	992.1	86.3	86.6	90	x 85	12.1	10.5	80	68	210	5	240	2	10	9	—	83	b. c. i. h. p. to o. a. c. p. p. o. n.
8	991.4	991.6	89.0	86.6	x 97	83	14.1	12.5	78	81	160	2	—	0	9	1	—	84	o. till 9 h., then very fine. y. a. and p.
9	991.2	993.8	89.6	86.6	95	79	12.9	12.4	69	80	210	3	—	2	9	8	—	78	\equiv early. c. a. b. c. p. c. n.
10	995.7	996.5	89.0	86.9	92	83	13.3	13.2	74	84	260	7	230	3	10	8	—	80	c. to o. ∞^0 a. and p. c. ∞ n.
11	995.1	992.7	89.9	87.7	96	83	13.3	13.6	70	82	270	5	230	2	2	—	85	\equiv Δ early. b. ∞^0 a. c. y. p. b. c. p. n.	
12	995.1	992.7	89.9	87.7	96	83	13.3	13.6	70	82	270	5	230	2	2	8	9.7	82	o. early. d. \equiv 9 h. o. p. 12 h. c. p. p. c. to o. q. n.
13	990.9	990.2	88.2	84.5	93	83	15.6	9.7	91	72	230</								

5. GEOPHYSICS:—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.								Air-Earth Current. $\times 10^{16}$.		Potential Gradient, Volts per metre. Factor 2·33.						
					Horizontal Comp't.				Declination.		Inclination.		Magnetic Character of Day.	Electric Character of Day.	Charge per cc. $\times 10^{20}$. +. -. About 15 h.	About 15 h.	3 h.	9 h.	15 h.	21 h.	
	0·3 m.	1·2 m.	Daily Mean.	Extremes.	Mean Time.		Mean Time.	West.	Mean Time.	North.											
	a.	a.	gm.	cm.	h m	γ	h m	°	h m	°			i	o	coulomb.	amp/cm².	v/m.	v/m.	v/m.	v/m.	
1	200+	200+	219	220	11 17	18386	14 27	14 47°	14 36	66 56°	4	20	o	o	0'25	0'35	0'45	170	155	130	255
2	89°2	86°6	218	...	...	...	...	...	...	...	2	20	i	i	...	...	...	170	145	115	170
3	90°1	86°6	218	...	...	...	...	...	...	...	2	20	o	o	...	...	...	130	155	115	100
4	89°6	86°8	217	...	...	...	...	...	...	...	2	20	i	i	0'33	0'23	0'55	70	230	85	155
5	88°9	86°7	216	...	...	...	...	...	...	...	2	20	o	o	55	43	0'75	200	155	145	145
6	89°0	86°8	214	...	...	...	...	...	...	...	2	20	o	o	23	33	1'35	170	200	155	145
7	89°7	86°9	213	...	11 3	18380	14 33	14 42°	14 33	66 56°	4	20	o	o	'53	'41	0'80	230	270	130	155
8	89°1	87°0	211	...	...	...	...	...	...	...	2	20	o	o	...	...	...	200	230	100	170
9	90°1	87°1	210	...	...	...	...	...	...	...	2	20	o	o	...	...	...	100	130	100	170
10	90°8	87°1	208	...	...	...	...	...	...	...	2	20	o	o	0'33	0'18	0'60	115	155	70	85
11	91°1	87°3	207	...	...	...	...	...	...	...	2	20	o	o	41	14	1'20†	85	240	130	100
12	91°2	87°4	206	...	...	...	...	...	...	...	2	20	o	o	1'03	'96	0'55†	130*	130*	85*	0*
13	91°4	87°4	206	...	...	...	...	...	...	...	2	20	o	o	0'78	'57	0'75†	70*	145*	85*	145*
14	91°8	87°6	206	...	11 4	18359	14 21	14 47°	14 36	66 58°	4	20	o	o	'47	'06	0'95†	155	215*	115	230
15	92°8	87°9	206	...	...	...	...	...	...	...	2	20	o	o	...	...	...	170*	215*	100	230
16	92°0	87°9	206	...	...	...	...	...	...	...	2	20	o	o	...	...	...	115	230	85	200
17	91°9	87°8	206	...	...	...	...	...	...	...	2	20	o	o	...	...	...	115	230	85	200
18	92°2	87°8	207	...	...	...	...	...	...	...	2	20	o	o	0'88	0'98	0'95	185	200	145	115
19	92°0	87°9	205	...	...	...	...	...	...	...	2	20	i	i	...	...	...	100	130	100	115
20	91°7	88°1	205	...	...	...	...	...	...	...	2	20	i	i	...	...	...	45	85	155	285
21	90°7	88°0	204	...	11 36	18389	14 31	14 44°	14 50	66 58°	2	20	o	o	0'90	0'90	0'95	130	270	145	130
22	89°9	88°0	203	...	...	...	...	...	...	...	2	20	o	o	...	...	...	155	185	100	200
23	89°7	87°9	202	...	...	...	...	...	...	...	2	20	o	o	...	...	...	115	170	70	170
24	89°9	87°9	201	...	...	...	...	...	...	...	2	20	o	o	...	...	...	85	85	100	115
25	89°4	87°9	201	...	...	...	...	...	...	...	2	20	i	i	...	...	...	70	155	145	170
26	89°8	87°9	202	...	...	...	...	...	...	...	2	20	i	i	...	...	...	55	215	170	200
27	88°9	87°9	201	...	...	...	...	...	...	...	2	20	o	o	...	...	...	1'05	115	200	240
28	87°9	87°9	201	201	11 18	18381	14 15	14 48°	15 18	66 57°	2	20	i	i	...	...	...	230	z±	130	185
29	88°6	87°8	201	...	...	...	...	...	...	...	2	20	o	o	...	...	...	70	315	315	-30
30	87°3	87°8	203	...	...	...	...	...	...	...	2	20	o	o	...	...	...	155	270	170	340
31	87°6	87°6	204	...	...	...	...	...	...	...	2	20	o	o	...	...	...	130	300	145	115
M.	90°1	87°5	207	...	...	...	...	...	...	...	2	20	o	o	...	...	...	122‡	191‡	123‡	156‡
	89°7	88°1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

* The behaviour of the instrument during this period was somewhat doubtful, more especially at 21 h. on 13th, and 3 h. and 9 h. on 14th.
 ‡ These values share any uncertainty affecting the potential gradient.

‡ Mean for 30 days.

6. GEOPHYSICS:—ESKDALEMUIR.

Day.	Magnetic Force.								Vertical Component.				Magnetic Character of Day.		Potential Gradient, Volts per metre. Factor 3·77.				
	North Component.			West Component.			Maximum. 44000 γ +.		Minimum. 44000 γ +.		Range.	Magnetic Character of Day.	Electric Character of Day.	3 h.	9 h.	15 h.	21 h.		
	Maximum. 15000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	h m	γ	h m	γ				v/m.	v/m.	v/m.	v/m.		
1	h m	γ	h m	γ	h m	γ	14 47	930	856	8 10	74	18 18	1162	1097	12 24	65	i	i a	200
2	1 5	1063	966	12 23	97	16 15	924	830	1 44	94	18 50	1133	1094	1 24	39	i	o a	100	
3	4 3	1033	964	10 57	69	16 5	921	832	4 48	89	20 55	1126	1086	2 46	40	i	o a	80	
4	17 4	1100	943	11 49	157	14 47	931	841	8 30	90	18 20	1146	1097	13 1	49	i	i a	200	
5	21 37	1053	961	12 59	92	13 42	938	851	22 9	87	14 47	1129	1094	12 1	35	i	o a	300	
6	16 16	1027	975	11 17	52	13 52	911	845	0 43	66	19 20	1121	1091	12 2	30	o	o a	265	
7	19 52	1045	962	11 55	83	15 18	910	843	7 54	67	20 6	1133	1093	23 59	40	o	o a	150	
8	22 5	1048	962	10 36	86	14 56	943	836	7 7	107	16 30	1140	1078	0 40	62	i	o a	160	
9	19 53	1031	963	11 39	68	13 13	931	848	7 2	83	15 40	1131	1093	2 10	38	o	o a	130	
10	19 17	1043	982	11 0	61	13 9	925	848	7 51	77	4 57	1120	1091	12 41	29	o	o a	380	
11	16 46	1242	665	9 54	577	16 48	1098	<660	9 2	<438	15 30	>1344	<845	2 20	32	2	o a	80	
12	7 14	1120	<627	2 10	493	1 53	984	649	2 1	335	18 59	1148	849	2 13	299	2	1 a	220	
13	19 43	987	920	11 11	67	13 24	883	844	7 4	39	16 46	1140	1117	11 38	23	o	1 b	175	
14	19 13	1004	940	10 15	64	12 47	911	837	7 20	74	5 23	1137	1110	12 26	27	o	1 a	145	
15	19 3	1034	955	11 53	79	14 31	932	832	7 40	100	20 10	1138	1112	13 39	26	i	1 a	265	
16	18 22	1025																	

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$ Heights above M.S.L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1.48 m. h_r = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.							Min. Temp. on Grass.	Percentage of Humidity.	Rain 0 h. to 24 h.	REMARKS.	Earth Current Character.	
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.	Mean of 5 Readings.	9 h.†	14 h.	21 h.	Mean			
1	mb.	mb.	mb.	mb.	200+	200+	200+	200+	200+	200+	200+	%	%	%	mm.	● ⁰ 14 h.	
2	1018.5	1018.3	1019.0	1018.6	89°0	89°4	87°7	90°4	86°1	88°5	79°0	87	94	91	—	● ⁰ 8 h. = 17 h. to night.	
3	1019.3	1018.7	1017.1	1018.4	89°1	90°7	88°1	92°1	86°9	89°6	83°3	96	85	93	—	● ² till 6 h. ● ⁰ 10 h.	
4	1017.1	1019.7	1018.5	1018.2	89°7	91°3	90°4	92°2	86°1	89°9	83°9	56	52	50	—	● ² 20 h. continuous.	
5	1016.1	1014.5	1010.9	1013.8	89°8	90°7	89°0	92°1	84°5	89°2	77°8	63	73	91	10°5	● ² till 6 h. ● ⁰ 10 h.	
6	1007.7	1009.4	1011.7	1009.6	90°1	91°9	89°1	93°5	86°1	90°1	88°1	87	73	83	2°7	—	
7	1015.5	1015.9	1015.8	1015.7	91°4	93°1	88°4	94°0	87°4	90°9	83°8	79	72	90	80	—	
8	1016.9	1017.0	1016.7	1016.9	91°0	92°6	88°0	92°7	87°0	90°3	83°6	70	53	78	67	—	
9	1016.2	1015.1	1014.3	1015.2	91°1	96°5	85°1	97°0	85°9	91°1	79°7	68	35	74	59	Sky cloudless.	
10	1013.8	1013.9	1014.5	1014.1	94°8	99°9	93°3	101°0	88°7	95°5	80°3	51	" 34	59	48	Sky cloudless.	
11	1016.5	1016.9	1017.3	1016.9	90°3	94°0	89°5	94°6	88°4	91°4	81°4	87	63	84	78	—	
12	1019.5	1019.7	1019.7	1019.6	91°9	95°1	89°1	95°6	88°3	92°0	85°6	76	51	82	70	⊕ 11 h.	
13	1015.8	1015.5	1015.7	1015.7	93°1	96°8	91°3	97°0	88°7	93°4	82°6	62	45	70	59	Fair.	
14	1016.6	1016.7	1016.1	1016.5	93°7	94°2	89°1	95°7	87°6	92°1	79°4	69	67	88	75	—	
15	1014.9	1012.7	1011.0	1012.9	94°0	100°7	94°1	x102°0	87°0	95°6	80°0	65	39	68	57	↙ in S.W. horizon at 21 h.	
16	1014.0	1014.9	1016.7	1015.2	92°5	94°0	90°0	96°0	88°9	92°3	87°3	90	72	93	85	↙ o h. 45 m. at sea to S.W. ● 20 h.	
17	1021.0	1021.1	1019.9	1020.7	91°7	94°6	89°7	95°0	88°8	92°0	84°5	86	66	92	81	⊕ 6 h. 30 m.-8 h. 30 m. ⊕ 16 h.	
18	1017.8	1016.7	1016.7	1016.7	90°9	96°1	90°7	97°0	88°4	92°6	82°3	77	52	93	74	—	
19	1012.9	1012.5	1011.3	1012.2	91°7	93°6	92°7	94°1	x90°2	92°5	87°5	86	82	81	83	o i ● ⁰ 8 h. 20 m.-10 h. 50 m.	
20	1008.5	1008.1	1009.9	1008.8	92°0	95°6	87°9	95°6	87°5	90°9	89	69	98	82	3°4	● ² 18 h. 30 m. continuous.	
21	1014.7	1017.0	1018.5	1016.7	90°2	91°9	87°5	92°9	85°5	89°6	85°3	80	56	83	73	● ² till 2 h.	
22	1019.4	1019.3	1018.6	1019.1	90°4	92°6	89°4	94°1	85°0	90°3	77°8	66	66	83	72	Fair.	
23	1018.4	1016.7	1015.5	1016.9	90°2	92°1	87°9	94°8	86°9	90°4	82°6	86	76	97	86	● ² 9 h.	
24	1013.7	1012.9	1012.5	1013.0	90°2	92°8	88°1	94°3	86°1	90°3	83°0	86	73	97	85	⊕ 19 h. 30 m. momentary.	
25	1008.5	1004.9	998.7	1004.0	91°2	94°6	90°9	95°8	86°1	91°7	79°7	86	61	84	77	5°9	
26	993.5	993.5	995.5	994.2	90°7	91°6	88.0	93°2	87.7	90°2	88.2	87	76	78	80	● showers evening.	
27	1000.6	1002.1	1001.8	1001.5	89°3	90°9	88°9	92°5	85°9	89°5	81°9	64	57	82	68	● 2° 3 h.	
28	990.6	992.6	993.0	992.1	91°3	91°5	89°6	94°0	88°2	90°9	84°5	87	94	93	91	⊕ from midnight all day.	
29	998.8	1000.5	1006.9	1003.1	89°2	87°0	84°8	90°4	84°5	87°2	84°6	82	77	66	75	● (frequent showers).	
30	1011.1	1010.6	1006.3	1008.7	87°0	88°5	85°9	n 89°2	n 82°2	86°6	n 77°3	56	57	98	70	2° 2 h., 6 h., 15 h., and 18 h.	
31	1003.5	1008.6	1012.6	1008.2	88°5	88°0	84°8	90°0	84°6	87°2	84°4	83	78	77	79	● showers from 4 h.-7 h.	
Means	1012.6	1012.7	1012.5	1012.6	91°0	93°2	89°1	94°5	86°9	90°9	82°9	77	64	83	75	55°0	
Normal	1010.5	1010.3	1010.5	1010.4	90°4	92°3	88°8	93°4	86°5	90°0	83°8	—	67	82	—	58°9	
	← 26 years	→ 26 years			← 26 years	→ 26 years			← 23 years	→ 23 years	← 24 years	→ 26 years					○°9

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).			Mean of Force	Sunshine. *		Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.										Mean Amount		
	Total.	Per cent. of Possible.	Tenths.		Upper.		Lower.		Upper.		Lower.		Upper.		Lower.				
9 h.†	14 h.	21 h.	9 h.†	9 h.†	Type.	Direction.	9 h.†	9 h.†	Type.	Direction.	14 h.	14 h.	14 h.	14 h.	21 h.	21 h.	21 h.	21 h.	Mean Amount
1	247	3	270	4	270	2	3°0	2°0	13	10	...	...	...	...	Nb.	...	6	A.-Cu.	WNW
2	270	3	247	3	247	4	3°3	1°3	9	10	...	...	...	...	...	...	10	...	...
3	337	4	270	4	270	2	3°3	14°2	94	2	...	...	Cu.	NNW	4	...	2	Ci.	...
4	270	3	247	4	247	4	3°3	9°3	62	6	Ci.	W	Cu.	W	8	...	...	...	...
5	337	3	360	3	315	2	2°7	6°3	42	8	...	...	Cu.-Nb.	NNW	3	...	4	Ci.-Cu.	A.-Cu.
6	23	3	247	4	293	3	3°3	12°2	82	3	...	...	Cu.	NNE	1	...	10	...	...
7	45	3	360	3	23	2	2°7	13°3	89	3	Ci.-Cu.	A.-Cu.	N	NE	0	...	0	...	...
8	157	2	113	2	67	3	2°3	14°7	100	0	...	...	...	...	0	...	0	...	...
9	180	2	180	2	203	1	1°7	14°7	100	0	...	...	...	...	0	...	0	...	...
10	293	2	315	3	315	2	2°3	7°0	48	10	...	...	...	...	6	...	6	{ Ci.-Cu. Ci. }	SW
11	360	3	23	3	23	3	3°0	14°4	98	5	Ci.	SW	...	...	4	...	4	{ A.-Cu. Ci. }	SW
12	67	2	360	1	45	3	2°0	13°2	91	3	Ci.	WSW	...	...	4	...	5	...	...
13	23	4	360	3	360	2	3°0	13°9	96	2	A.-Cu.	SW	...	...	0	...	0	...	0°3
14	337	2	337	1	17	9°8	68	0	...	...	...	...	I	...	0	...	0	...	...
15	90	2	67	4	3°0	11°6	80	0	...	...	...	...	0	...	0	...	5	A.-Cu.	...
16	247	3	247	3	270	3	3°0	3°6	25	7	...	...	...	...	7	...	2	Ci.-Cu.	SW
17	293	3	225	3	247	2	2°7	9°7	68	7	...	...	Cu.-Nb.	WNW	2	...	2	Ci.	SW
18	225	4	203	4	225	3	3°7	10°2	71	2	Ci.	...	...	...	2	A.-Cu.	SW	...	...
19	225	5	203	5	203	5	5°0	2°1	15	9	...	...	Cu.-Nb.	WSW	10	...	6	...	...
20	203	5	203	4	315	1	3°3	0.2	2	10	...	...	6	Ci.-A.-Cu.	WSW	10	...	...	...
21	315	3	293	1	293	1	1°7	7°8	55	6	...	...	Cu.-Nb.	W	8	...	8	Ci.-Cu.	

8. **WIND COMPONENTS** : Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

ENGLAND S.W.:—SCILLY.

Height of Head above—Ground 9·8 m., M.S.L. 49·7 m.
Height of Cups above—Ground 5·8 m., M.S.L. 45·7 m.

ENGLAND E. := SHOEBURYNESS.*

Height of Head above—Ground 27·4 m., M.S.L. 31·4 m.

* The Anemograph at Great Yarmouth having been out of action during the greater part of the year 1919, data for Shoeburyness are now given in this table.

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ.	Remarks.
				A _{N.}	A _{E.}	A _{Z.}		
3	e L F	h m s	s	μ	μ	μ	km.	
		18 31 55	...	...	...	...
		18 52	...	...	...	...
7	L F	17 16	18	...	...	...	...
		17 36	...	...	...	...
		5 24 50	...	...	...	...
		5 31 54	...	...	...	...
		5 41	...	...	...	...
		6 10	...	...	...	...
8	P S L F						5400	
18	P PR S L F	17 14 20	...	...	...	...	8450	
		17 17 45	...	...	...	...
		17 24 3	...	...	...	...
		17 40	...	...	...	...
		19	...	...	...	...
19		0 42	to	...	...	...	Slight disturbance.	
		0 50	...	...	...	...
19	e L F	20 29 20	...	...	...	...
		20 36	...	...	...	...
		20 55	...	...	...	...
22	e L F	22 44 57	...	...	...	...
		22 48	...	...	...	...
		23 7	...	...	...	...
25	L F	20 31	24	...	...	...
		21 15	...	...	...	...
27	L F	6 10	...	...	...	...	Earlier phases masked by wind effects.	
		7	...	...	...	...
28	L F	20 17	25	...	...	...
		20 37	...	...	...	...
29	O P S L M F	5 51 52	...	...	...	...	8450	
		6 3 36	...	...	...	...
		6 13 18	...	...	...	...
		6 29 30	...	...	...	...
		6 46 11	27	44	...	...
		8 55	...	...	...	...
31	P PR S L F	17 39 48	...	...	...	...	7650	△ deduced from PR—P. Times of S and L doubtful.
		17 42 56	...	...	...	...
		17 48 46	...	...	...	...
		18 2 30	...	...	...	...
		20 30	...	...	...	...

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	o h.		6 h.		12 h.		18 h.	
	A_{N.}	T.	A_{N.}	T.	A_{N.}	T.	A _{N.}	T.
1	μ	s	μ	s	μ	s	μ	s
2	0.6	5.5	0.7	6	0.7	5.5	0.5	5
3	0.8	4	0.8	5	0.5	5	0.8	5.5
4	1.0	5	1.0	5	1.0	4.5	1.0	5
5	0.8	5.5	0.7	5	0.7	4	0.3	4
6	0.2	4	0.0	3	0.1	3	0.1	3.5
7	0.6	4	0.8	4	0.5	5	0.8	5
8	0.7	4.5	0.5	4.5	0.3	4.5	0.2	4.5
9	0.1	4	0.1	4	0.1	4	0.0	0
10	0.1	3	0.1	4	0.1	4	0.2	4.5
11	0.2	4	0.2	4	0.3	4	0.3	4
12	0.5	4.5	0.5	5.5	0.5	5	0.8	5
13	0.6	5	0.8	5.5	0.9	5	1.1	4
14	0.8	6	0.7	5.5	0.7	5	0.6	5
15	0.7	4	0.8	4	0.3	4	0.6	4
16	0.3	4	0.2	4	0.5	4	0.1	3
17	0.3	4	0.7	4.5	0.5	4.5	0.9	5
18	1.1	4.5	1.6	6	1.2	5.5	1.5	5
19	2.0	4.5	1.7	5	0.8	6	0.8	5.5
20	0.9	5	0.7	5.5	0.5	5	0.8	4
21	0.5	4	0.4	4.5	0.6	4	0.6	4
22	0.8	4	0.3	4	0.5	3.5	0.4	3.5
23	0.5	4	0.2	4	0.3	3	0.0	2.5
24	0.0	0	0.1	3	0.0	0	0.0	0
25	0.0	0	0.1	3	0.3	3	1.1	3
26	1.0	3.5	1.3	3	1.1	4	1.1	4.5
27	1.1	4	1.3	3.5	0.9	4	1.1	4
28	1.1	4	0.8	4.5	0.8	4	0.9	3.5
29	1.4	4	...	...	1.1	4	0.9	4.5
30	0.8	4.5	0.6	4.5	0.7	4.5	0.6	4
31	0.8	5	0.7	4	0.2	4	...	...

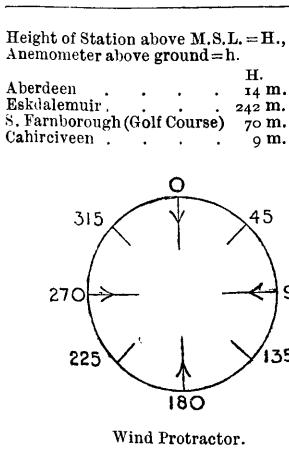
Means for Month $\{ A_N = 0.6 \}$. Normals, 1911-18 $\{ A_N = 0.4 \}$.

EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).

Day.	Times, G.M.T. of		Remarks.
	Commencement.	Max. Phase.	
3	h m	h m	Very small.
18	...	17 38	Succession of very small waves.
19	...	4 28	Very small.
19	...	20 40	Very small.
22	...	22 49	Very small.
25	...	20 40	Succession of very small waves.
27	...	6 30	Succession of small waves.
28	...	20 32	Very small.
29	6 9	6 57	
31	17 52	{ 18 31.5 19 1 }	Equal maxima.

10. SOUNDINGS WITH PILOT BALLOONS.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.														Cloud Observations.									
		Geostrophic.		By Anemometer.		At Heights above M.S.L.										Time, G.M.T. h. m.		Type.		Deg. from N.		Type.		Deg. from N.	
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.											
ABERDEEN.																									
12	7 30	260	8	calm		300	3'5	305	10'5	275	19'5	...	...	...	...	15 0	Cu.	275	2'0	Ci-Cu.	270	0'5
20	7 30	240	7	215	3'5	230	10'5	240	8'5	230	11'0	...	...	...	...	13 0	St-Cu.	...	...	Ci-Cu.	225	1'5
25	7 30	?	?	305	1'5	140	5'5	170	3'0	240	4'0	300	4'5	280	7'5	...	...	...	...	Ci-St.	...	...	
28	7 30	?	?	280	3'0	315	12'5	315	11'0	295	8'0	...	...	...	...	...	...	...	...	Ci, Ci-St.	...	...	
ESKDALEMUIR.																									
5	17 25	280	6	290	4'4	300	5'5	280	4'4	350	8'0	...	...	...	...	12 55	Cu.	315	...	Ci-St.	225	3'5
9	12 10	?	?	230	3'0	240	4'7	270	3'1	220	8'0	240	8'0	...	...	...	Cu.	270	4'5	A-S.	360	...
10	17 40	315	6	315	11'5	320	10'5	330	11'5	315	6'5	...	...	...	...	...	Fr-Cu.	...	...	Ci-St.	315	1'0
11	17 30	270	10	270	2'5	255	5'5	280	15'5	290	18'0	...	...	...	...	12 45	Fr-Cu., Cu.	315	...	Ci, Ci-St.	295	5'5
14	12 50	?	?	315	7'0	305	5'5	320	4'6	320	11'0	...	...	...	...	...	...	...	...	...	...
14	17 35	?	?	240	3'5	240	6'5	255	5'0	325	5'5	305	9'5	...	...	...	Cu., Cu-Nb.	270	...	...	...	...
15	7 20	?	?	240	3'5	235	3'0	240	4'2	250	9'0	275	10'0	270	15'5	A-Cu.	250		
15	11 50	?	?	190	4'0	210	1'7	240	6'0	275	8'0	240	10'5	...	...	...	A-Cu.	245	...	Ci-St.	260	1'0
17	7 25	225	10	210	4'0	240	6'0	265	14'5	260	18'0	...	...	...	...	6 45	Cu.	...	...	Ci	280	4'0
20	7 25	240	8	185	4'5	205	7'5	225	8'5	245	13'0	...	...	...	...	7 50	St.	215	...	A-Cu.	240	6'5
21	17 30	270	10	270	2'6	265	5'5	260	6'0	270	19'0	...	...	...	...	15 0	St-Cu.	270	...	A-St.	225	6'5
24	7 15	?	?	calm	15	6'5	335	2'0	320	8'0	315	14'5	305	18'5	7 0	St-Cu.	...	...	A-St.	270	5'0		
28	7 20	?	?	calm	75	1'5	95	2'3	210	3'5	230	8'0	235	7'5	...	A-Cu.	...	...	A-St.	290	5'5		
29	7 15	310	9	280	2'4	300	3'2	295	14'0	310	12'5	...	...	...	...	9 0	Cu., A-Cu.	...	...	Ci	225	1'5
31	7 10	315	11	150	1'0	350	4'3	315	2'8	280	6'5	320	10'0	300	8'0	7 50	Cu.	280	...	Ci	300	1'0			
SOUTH FARNBOROUGH.																									
5	6 35	340	7	280	5'0	350	9'5	350	6'0	330	8'5	...	...	...	...	...	St., St-Cu.	...	...	A-Cu.	...	...	
6	9 5	310	10	290	5'0	280	5'5	285	5'0	320	7'0	340	11'5	350	15'0	...	Fr-Cu.	...	...	...	...	...
7	6 25	?	?	310	5'0	355	10'5	340	10'5	340	10'5	325	17'5	...	...	...	Fr-Cu.	...	...	...	...	...
7	14 35	?	?	360	5'0	345	4'8	335	6'0	340	10'5	...	...	...	...	...	Fr-Cu.	...	...	...	...	...
8	6 30	?	?	300	3'7	240	4'0	335	3'8	335	3'9	325	11'0	310	7'5	...	...	...	...	...	...	...
8	13 50	?	?	255	2'0	240	2'1	215	2'0	325	3'5	280	5'0	290	7'5	...	...	...	...	...	...	...
9	6 35	?	?	335	2'5	170	7'5	195	5'5	205	8'5	230	7'0	235	9'5	...	A-St.	...	...	...	...	...
11	6 25	350	7	305	0'4	15	8'0	350	7'0	355	9'0	315	10'5	305	8'5	...	...	...	...	...	...	...
12	6 40	?	?	190	1'0	205	2'5	190	3'7	225	3'9	210	3'7	240	6'0	...	...	...	cloud less	...	...	...
13	6 30	?	?	305	2'3	10	5'0	320	3'8	285	6'0	285	14'0	295	12'0	...	...	...	...	...	...	...
15	9 35	?	?	135	2'4	155	3'7	140	4'0	265	4'0	280	6'0	280	11'0	...	St-Cu.	...	...	...	...	...
15	13 10	?	?	90	5'5	150	2'0	185	3'4	275	4'2	295	9'5	275	8'0	...	Cu.	...	...	...	...	...
16	6 30	225	7	180	6'0	215	6'5	225	14'0	200	15'0	205	14'5	...	...	...	St-Cu.	...	...	...	...	...
21	6 30	300	7	225	5'5	315	7'5	295	7'5	270	12'0	265	17'0	265	17'5	...	Fr-St.	...	...	Ci, Ci-Cu.	...	...	
22	6 35	260	11	240	7'0	255	10'5	260	11'5	290	16'0	...	...	...	...	...	St-Cu., Nb.	...	...	Ci.	...	...	
23	6 25	280	9	260	7'0	280	9'5	300	13'5	290	10'5	290	16'0	...	...	...	St., A-Cu.	...	...	Ci, Ci-Cu.	...	...	
27	7 10	280	20	270	13'0	270	14'5	280	25'5	280	30'0	...	...	...	...	...	Fr-St., St-Cu.	...	...	A-Cu.	...	...	
29	9 0	270	8	260	6'0	250	4'6	240	9'0	230	14'0	235	16'5	...	...	...	Cu., Fr-Cu.	...	...	A-St.	...	...	
30	6 30	270	8	290	7'0	290	10'0	280	10'5	255	8'0	280	10'5	280	12'5	...	Cu.	...	...	A-St.	...	...	
						5000 m.		6000 m.		7000 m.		8000 m.		9000 m.		10,000 m.									
8	6 30			295	11'0	300	15'0	295	16'0	295	22'5	285	21'0	295	27'0	...	...	...	...	...	...	...
8	13 50			275	13'5	265	14'0	270	17'0	265	20'5	265	23'5	...	...	...	A-St.	...	...	...	...	...
9	6 35	(For observations at lower levels, see above.)			245	15'0	245	16'5	250	18'0	250	22'5	255	23'0	...	...	...	...	...	...	...	...
11	6 25			290	11'5	...	...	...	...	250	11'5	225	9'5	...	...	...	...	...	...	...	...	...
12	6 40			250	6'5	225	7'5	230	9'5	250	11'5	225	9'5	...	...	...	...	...	...	...	...	...
13	6 30			290	14'5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	13 10			290	6'0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	6 30			255	29'0	255	32'5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	6 30			290	12'0	300	8'0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...



August 1919.

During the whole month there was a persistent anticyclone over the Azores region, frequently

extending to the British Isles and the Continent.

5th to 15th. High over the British Isles.

16th, 7 h. Shallow Low to the N. of Ireland; wedge over Scandinavia.

17th, 7 h. S.W.-N.E. ridge over the British Isles.

18th, 7 h. Westerly type.

20th, 7 h. Shallow Low N.W. of Ireland; High over the Continent.

21st to 23rd. Anticyclone centred over the Bay of Biscay; shallow Low over Scandinavian region.

24th, 7 h. Shallow Low centred to the W. of Ireland; depression centred near Vardö; ridge

25th, 7 h. along the British Isles.

27th, 7 h. Deep depression centred near Leith.

28th, 7 h.

10. SOUNDINGS WITH PILOT BALLOONS—continued.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.												Cloud Observations.									
		Geostrophic.		By Anemometer.		At Heights above M.S.L.								Time, G.M.T.		Type.		Deg. from N.		Type.			
		Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	h. m.		Deg. mr/s.	Type.	Deg. mr/s.	Type.	Deg. mr/s.	N.		
CAHIRCIVEEN.																							
6	12 20	315	7	325	6.5	360	3.9	320	7.5	320	11.0	...	...	...	...	Cu., St-Cu.	335	...	Ci-Cu.	280	1.0
7	7 15	?	?	calm		...	...	50	2.9	355	6.5	325	7.0	...	...	A-Cu.	280	1.5	Ci-Cu.	280	1.0
8	11 45	?	?	130	3.0	120	3.0	135	7.5	150	7.0	155	8.0	150	9.0	...	...	...	...	cloud less	
8	16 35	?	?	335	3.0	...	...	120	7.5	155	10.5	155	9.0	160	9.5	...	...	...	...	cloud less	
9	17 5	250	4	235	2.8	220	4.0	225	6.0	250	7.5	185	4.5	...	...	Cu., St-Cu.	235	5.0	Ci-Cu.	210	2.0
11	17 15	?	?	230	3.1	240	1.9	305	3.7	210	2.0	170	3.2	140	3.6	Cu.	225	...	Ci-Cu.
14	16 15	210	7	270	3.0	225	2.8	240	3.1	265	6.5	...	...	...	...	Cu.	245	...	Ci-Cu.	235	1.5
16	7 20	270	8	calm		290	6.0	290	12.5	290	14.5	...	...	...	...	St., Fr-Cu.	270	...	...	...	...
18	7 40	270	9	185	0.6	275	6.0	280	7.5	265	16.0	255	23.0	245	23.5	Cu.	A-Cu.	250	5.5
21	7 10	?	?	100	0.9	280	6.5	280	7.5	270	7.5	...	...	...	...	St-Cu.	225	...	A-Cu.	245	...
21	16 30	260	9	230	5.5	240	6.0	255	6.5	260	9.5	270	15.5	275	13.5	Cu., St-Cu.	225	...	Ci-Cu.	295	...
23	17 10	225	8	330	4.0	295	2.9	340	3.0	205	7.0	...	...	...	...	St-Cu.	290	2.0	Ci-St.	290	3.0
24	7 40	?	?	330	...	340	1.9	250	2.4	350	7.5	265	7.0	...	...	Cu., St.	...	...	Ci-Cu., Ci-St.	275	3.0
29	7 25	340	8	360	3.6	360	8.5	360	12.5	355	14.5	...	...	...	...	Cu.	...	...	A-Cu.	335	...
31	7 20	300	5	calm		270	0.5	300	16.0	315	9.0	325	10.0	325	17.0	St.	Ci-Cu.	315	...
		5000 m. 6000 m. 7000 m.																					
8	11 45	(For observations at lower levels, see above.)												175	8.5	...	...	...	...	...	...
31	7 20	320 21.0 325 28.5 325 33.0												...	...	...	...	...	...	...

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN.

Day and Hour G.M.T.	Type of Cloud.	Velocity-height-ratio.												Remarks.							
		Degrees from N.	Milliradians per Second.	Components.																	
				W.-E.	S.-N.	W.-E.	S.-N.	W.-E.	S.-N.	W.-E.	S.-N.	W.-E.	S.-N.	W.-E.	S.-N.	W.-E.	S.-N.	W.-E.	S.-N.		
1 13	St-Cu.	265	4.5	mr/s.	mr/s.	mr/s.	mr/s.	+	4.5	+ 0.3	- 1.1	St-Cu. in heavy semi-lenticular masses.									
2 13	Cu.	278	7.6	7.6	7.5	7.6	7.5	-	7.5	- 1.1	- 1.1	Cu. changing to Cu-Nb.									
5 13	Cu.	280	6.6	6.6	6.5	6.6	6.5	-	6.5	- 1.1	- 1.1	Low type of Cu.; Fr-Cu. in places.									
6 13	Cu.	295	10.0	10.0	9.1	10.0	9.1	-	9.1	- 4.2	- 4.2	Cu. and Fr-Cu.									
7 13	A-Cu.	315	3.0	3.0	2.1	3.0	2.1	-	2.1	- 2.1	- 2.1	St-Cu. varying to A-Cu.									
7 18	A-Cu.	315	2.2	2.2	1.6	2.2	1.6	-	1.6	- 1.6	- 1.6	Gi-Cu. to A-Cu.									
12 18	A-Cu.	260	1.3	1.3	1.3	1.3	1.3	-	1.3	- 0.2	- 0.2	Trace of Ci. Observation at 12 h.									
15 13	A-Cu.	290	1.6	1.6	1.5	1.6	1.5	-	1.5	- 0.5	- 0.5	Ci. to Ci-Cu.; slight K p.m.									
15 18	A-Cu.	205	1.6	1.6	0.7	1.6	0.7	-	0.7	- 1.4	- 1.4										
17 12	Ci.	270	2.0	2.0	2.0	2.0	2.0	-	2.0	- 1.8	- 1.8										
18 13	Cu.	270	3.7	3.7	3.7	3.7	3.7	-	3.7	- 3.7	- 3.7										
19 18	Cu.	250	1.7	1.7	1.6	1.7	1.6	-	1.6	- 0.6	- 0.6										
20 13	Ci-Cu.	225	1.6	1.6	1.1	1.6	1.1	-	1.1	- 1.1	- 1.1										
21 13	St-Cu.	290	3.3	3.3	3.3	3.3	3.3	-	3.3	- 1.1	- 1.1										
22 13	Cu-Nb.	315	2.5	2.5	1.8	2.5	1.8	-	1.8	- 1.8	- 1.8										
23 13	St-Cu.	270	1.6	1.6	1.6	1.6	1.6	-	1.6	- 1.6	- 1.6										
24 13	St-Cu.	320	3.3	3.3	2.1	3.3	2.1	-	2.1	- 2.6	- 2.6										
24 18	St-Cu.	315	3.0	3.0	2.1	3.0	2.1	-	2.1	- 2.1	- 2.1										
27 13	Fr-St.	315	20.0	20.0	14.0	315	14.0	-	14.0	- 14.0	- 14.0										
29 13	Cu.	280	4.0	4.0	3.9	4.0	3.9	-	3.9	- 0.8	- 0.8										
30 13	St-Cu.	305	5.0	5.0	4.1	5.0	4.1	-	4.1	- 2.9	- 2.9										
31 13	Cu.	310	2.2	2.2	1.7	2.2	1.7	-	1.7	- 1.4	- 1.4										

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Station.	Aurora Observations.						Remarks.					
			Eskdalemuir.	Richmond.		Deerness	...	Baltasound	...	Deerness	...	Baltasound	...	Deerness	...	Baltasound	...
3	...	☽	I, I	I, O	Deerness	...		Baltasound	...	Deerness	...	Baltasound	...	Deerness	...	Baltasound	...
8	p.	○	I, O	O, O													
11	...	○	O, 2	O, 2	Deerness	...		Baltasound	...	Deerness	...	Baltasound	...	Deerness	...	Baltasound	...
14	p.	...	O, I	O, O													
18	...	☾	I, I	I, I	Deerness	...		Baltasound	...	Deerness	...	Baltasound	...	Deerness	...	Baltasound	...
25	...	●	O, I	O, I													
28	p.	...	I, O	I, I	Baltasound	...		Baltasound	...	Baltasound	...	Baltasound	...	Baltasound	...	Baltasound	...
30	p.	...	O, O	O, O													

Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at midnight of the night in question.

METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—*Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.*

Ninth Year.—No. 9. SEPTEMBER 1919.]

Units based on the C.G.S. System.

[Price 1s.]

I. SUNSHINE AND SOLAR RADIATION.

Day.	WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.						RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.						ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.						CAHIRCIVEEN.		
	Bright Sunshine.*		Radiation received on Horizontal Surface by Callendar Radiograph.						Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.				Bright Sunshine.*		Radiation by Ångström Pyrheliometer.				Bright Sunshine.*		
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.		Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	$\frac{p}{p_0}$ sec Z.	Intensity.	Total.	Per cent. of Possible.	Bright Sunshine.*			
					For Day.	11.30 h. to 12.30 h.																	
					Amount.	Time.																	
1	hr.	%	j/cm²	%	mw/cm²	h. m.	mw/cm²	hr.	%	mw/cm²	hr.	%	h. m.	mw/cm²	hr.	%	hr.	%	hr.	%	hr.	%	
4·0	30	1428	49	1428	x 80	12 30	x 80	4·7	35	...	0·0	0	...	...	0·2	2	0·2	2	0·2	2	0·2	2
2	2·9	21	863	30	64	12 54	53	2·2	16	...	5·2	38	...	...	8·7	64	...	...	...	...	...	...
3	0·2	1	637	22	53	11 40	53	0·7	5	...	9·7	71	12 17	Clear	1·45	90	10·4	77	8·8	66	7·1	57	
4	4·1	31	954	33	57	10 40	48	3·7	28	...	0·4	3	...	...	4·7	35	4·7	35	4·7	35	4·7	35
5	8·0	61	1298	46	71	12 10	71	7·7	58	...	5·2	38	...	...	4·0	31	4·0	31	4·0	31	4·0	31
6	4·8	37	1126	40	66	13 25	52	5·3	41	...	2·3	17	...	...	2·3	17	...	...	2·3	17	...	...
7	6·3	48	1347	49	67	13 55	63	5·5	42	...	9·2	69	...	...	2·1	14	...	...	2·1	14	...	...
8	6·8	52	1125	41	68	13 2	64	6·8	52	56	40	...	...	...	0·0	0	...	...	0·0	0	0·0	0
9	11·0	85	1544	57	59	12 50	57	x 11·5	89	71	49	Clear	0·7	5	5	3·1	24	3·1	24
10	x 11·2	86	x 1664	62	67	11 58	67	7·9	61	75	52	Clear	4·3	33	...	...	...	...	11·2	86	11·2	86
11	10·4	81	1465	55	61	12 12	61	10·8	84	75	51	Clear	5·6	43	...	...	...	...	0·4	2	0·4	2
12	9·7	76	1406	53	57	11 40	57	11·1	87	70	48	Clear	0·0	0	...	...	...	...	7·3	56	7·3	56
13	0·0	0	n 221	9	15	10 37	11	0·0	0	5·3	41	5·3	41
14	0·0	0	500	19	34	12 55	24	0·0	0	...	...	...	...	...	8·7	67	...	...	...	...	6·2	49
15	0·0	0	—	—	—	—	—	0·0	0	...	...	...	...	...	x 11·6	91	...	...	...	...	10·5	83
16	2·9	23	? 692	27	54	10 20	51	2·7	21	...	7·4	58	6·8	54	6·8	54
17	8·3	66	1151	46	54	12 10	54	9·1	73	47	31	Hazy	1·6	13	...	...	...	...	0·7	5	0·7	5
18	8·3	66	1203	49	54	11 55	54	8·5	68	53	35	Hazy	4·3	34	...	...	...	...	1·5	12	1·5	12
19	1·4	11	526	22	50	14 18	36	1·5	12	...	7·0	56	...	...	...	...	...	...	7·0	56	7·0	56
20	7·3	59	1343	56	64	11 7	63	7·6	62	78	50	Clear	4·8	39	...	...	...	...	8·5	68	8·5	68
21	7·7	63	1119	47	66	12 4	66	7·8	64	...	...	...	...	...	8·3	68	...	...	...	...	2·5	20
22	0·2	1	522	22	34	9 14	33	0·2	1	...	...	...	...	...	2·2	18	...	...	...	...	0·0	0
23	1·6	13	575	25	71	12 25	71	1·3	11	...	6·2	51	...	...	...	...	...	...	...	...	6·6	55
24	5·1	42	1078	48	58	13 0	56	5·9	49	70	43	...	...	...	0·0	0	...	...	...	...	0·0	0
25	3·0	25	664	30	63	12 35	47	1·9	16	...	...	...	...	...	3·0	25	...	...	...	...	3·0	25
26	0·1	0	264	12	28	9 14	14	0·1	1	...	...	...	...	...	3·0	25	...	...	...	...	8·0	67
27	4·9	41	1046	48	57	11 34	57	5·7	48	45	27	...	...	...	10·6	90	...	...	...	...	8·0	67
28	5·3	45	965	45	63	12 50	56	5·7	48	...	...	...	...	...	7·4	63	...	...	...	...	7·3	62
29	8·5	73	1146	54	51	12 30	51	8·9	77	...	...	...	...	...	0·0	0	...	...	...	...	0·8	7
30	6·9	59	1006	48	54	12 5	54	7·7	66	...	...	...	...	...	0·4	3	...	...	...	...	0·2	2
Means	5·03	40	963†	38	55	—	51	5·10	41	—	—	—	—	—	4·20	34	—	—	—	—	5·10	41	
Normal	4·23	34	926	37	—	—	—	4·83	39	—	—	—	—	—	4·30	34	—	—	—	—	4·43	36	
			← 35 years →		← 7 years →			← 35 years →				← 5 years →			← 45 years →		← 30 years →				← 45 yrs →		

* Mean of 29 days only.

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9·1 m. H_b = 13·7 m. H_a = 26·4 m. Above Ground: h_t = 1·3 m. h_r = 0·56 m. h_a = 13·9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.		Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0–10) and Weather.		Rain 0 h. to 24 h.		Min. Temp. on Grass.		REMARKS.		Magnetism.				
					Vapour Pressure.	Percentage.															
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.			
1	mb.	mb.	a.	a.	200+	200+	200+	200+	millibar.	%	%	215	5	195	3	10	9	8·8	86	● n. and a. o. and p. day.	Horizontal Force, Declination West, and Inclination.
2	1000·5	1002·5	89·2	87·1	91	87	18·0	15·0	99	94	210	5	250	2	6	8	1·0	84	Fair n. and a. Fine and p. day.		
3	1002·9	997·2	87·9	88·0	91	83	13·9	15·5	83	92	170	5	145	12	5	10	●	x 18·1	79	Fine n. and morning and □. Fine day.	
4	994·5	997·6	89·8	89·5	92	x 88	16·5	16·2	87	87	175	8	175	10	8	17·9	86	● ² n. Fine day. [● ² evening.			
5	1000·0	1009·8	88·9	88·4	91	87	16·7	15·8	93	91	180	7	245	5	10	34	88	p. n. Fair and p. day.			
6	1017·9	1018·7	88·5	88·2	90	86	14·6	16·4	84	96	280	4	180	5	6	10	85	p. to fine morning. o. to ● p.			
7	1024·7	1026·4	87·9	84·8	89	82	12·1	11·8	72	86	5	3	—	0	3	1	84	● n. Fine morning and day.			
8	1024·7	1025·3	87·6	89·0	91	82	16·3	17·1	99	95	185	3	195	3	10	1·3	80	Fine n. o. to d. morning and day. —	19° 27' 3		
9	1025·5	1023·6	89·1	88·1	91	x 88	17·2	14·5	95	85	155	7	160	7	10	8	88	o. n. o. to d			

3. METEOROLOGY :—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28'$ N. Long. $0^{\circ} 19'$ W.Heights above Mean Sea Level :—Rain-gauge Site, H = 5·5 m. Barometer, H_b = 10·4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground :—Thermometers, h_t = 3·0 m. Rain-gauge, h_r = 0·53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.				
			Vapour Pressure.		Percentage.														
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.							
1	mb.	mb.	a.	a.	a.	a.	millibar.	%	%	° m/s.	° m/s.	Tenths of Sky covered.	mm.	a.	200+	early. Fine to fair all day.			
2	1017·1	1013·1	200+	200+	200+	200+	12·3	12·2	75	81	230	3	190	2	75	75	• d. 6 h. 45 m. Fine to overcast day.		
3	1008·1	1007·2	90·4	89·8	93	85	15·2	16·3	77	86	190	4	180	2	81	81	• and early. Overcast to cloudy. • at n.		
4	1005·3	1006·4	90·9	89·2	95	88	18·5	16·1	91	88	—	1	—	0	9	7·9	83		
5	1010·9	1013·9	89·9	91·6	93	88	14·5	16·6	76	78	220	5	180	4	0·6	86	• early and in p. Fine to fair, then dull.		
6	1015·9	1015·2	92·8	91·6	98	x 90	16·7	18·3	73	86	200	3	—	1	8	88	• at n. Fair to fine.		
7	1018·3	1020·8	90·7	89·9	96	87	17·3	15·5	86	81	270	3	240	2	0·6	85	• and early. Dull to fair, fine.		
8	1023·5	1024·9	88·2	90·7	93	84	14·2	17·1	83	85	240	2	—	1	2·d	78	early. Dull to fine to fair.		
9	1026·1	1025·8	90·7	90·3	96	87	15·2	17·0	76	87	—	1	270	2	85	85	Fine to fair during the day.		
10	1027·3	1027·1	88·6	89·1	97	85	14·9	15·6	85	86	—	1	—	1	3·d	79	early. Fine all day, with ∞^0 .		
11	1019·6	1017·2	92·2	91·1	x 101	84	16·7	17·5	76	85	—	1	—	0	0·1	79	early. \equiv to 9 h. 30 m. and at n. Fine ∞^0 .		
12	1016·3	1016·0	93·0	91·1	100	86	16·7	17·3	72	84	200	2	—	1	0·1	81	• and early. Fine all day.		
13	1017·3	1017·9	88·5	88·3	90	87	15·7	15·0	90	87	30	4	40	5	10 \equiv	10 \equiv	Dull all day, with \equiv^0 . e. at 21 h.		
14	1019·5	1021·3	86·8	86·9	90	86	13·1	14·5	84	92	30	3	30	4	10	10•	Dull all day. • late p. and n. \nwarrow 17 h. \rightarrow 19 h. 30 m.		
15	1026·5	1028·8	86·5	87·0	89	85	11·3	11·1	74	70	40	4	60	3	10	9	Dull and overcast all day.		
16	1030·0	1029·5	88·0	86·4	91	84	11·1	13·3	66	87	60	3	—	0	84	Fair in a., with \equiv^0 . Dull to fine in p.			
17	1030·1	1026·9	84·6	85·8	93	82	12·1	13·5	89	92	—	1	—	0	0·1	77	• and \equiv^0 in a., then fine.		
18	1020·9	1010·2	86·0	89·1	94	81	13·5	15·1	91	83	—	1	230	4	0·1	10	early. \equiv and \equiv^0 in a. Fine to dull p.		
19	1005·6	1008·1	85·0	80·4	88	78	9·7	7·7	70	75	290	5	310	2	0·6	78	and • p. early. Fine to dull to fine.		
20	1004·7	1002·5	79·0	81·3	85	75	6·9	8·9	74	82	280	3	4·d	9•	early. • late p. Fine to dull.				
21	1004·8	1007·1	82·1	81·1	87	77	8·4	8·5	73	79	290	4	—	1	5	71	Dull to fine, with \equiv^0 .		
22	1002·8	997·1	83·5	86·6	88	79	9·4	12·8	75	83	240	5	220	6	9•	72	\equiv^0 about 7 h. Dull all day.		
23	995·1	1005·4	87·7	81·1	90	79	14·2	10·2	86	95	220	5	—	0	6	84	• early and about 12 h. \equiv^0 n. Fair to fine		
24	1011·5	1012·5	81·4	85·7	88	77	9·4	11·8	86	81	350	2	230	6	4 \equiv	9	\equiv and \equiv early. Fine, with \equiv^0 a., then fair.		
25	1014·3	1015·2	88·2	88·8	92	86	14·0	14·4	82	81	250	5	240	4	10	8	Dull in a. and at n. Fair in p.		
26	1009·7	1011·3	87·9	84·0	90	83	12·9	9·2	77	71	220	8	280	2	10	2·7	85	• in p. Fair to dull. Fine at n.	
27	1015·2	1015·9	83·0	81·3	86	80	8·7	8·3	71	76	280	2	350	2	2 \equiv	o	\equiv^0 in a. Fair to fine all day.		
28	1017·4	1020·6	79·7	79·4	n 85	76	7·5	7·6	77	80	360	4	—	1	3	73	Fine in a. Fair to fine in p.		
29	1024·7	1023·8	78·3	78·3	87	n 72	8·0	8·1	90	91	—	1	—	1	0·1	n 66	\equiv^0 early and at n. \rightarrow early. Fine.		
30	1019·6	1011·0	80·3	79·4	89	n 72	9·0	8·5	88	89	—	1	150	2	4 \equiv	0·1	\equiv^0 early and at n. \rightarrow early. Fair to fine.		
Means	1017·5	1016·9	86·6	86·4	91·7	82·2	12·7	13·2	80	84	—	2·9	—	2·1	5·6	3·9	36·9	78·8	Monthly Totals or Means.
Normal	1016·0	1015·8	86·8	86·1	91·2	82·7	12·5	12·7	80	83	—	—	—	—	—	—	—	—	Normals.

4. METEOROLOGY :—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19'$ N. Long. $3^{\circ} 12'$ W.Heights above Mean Sea Level :—Rain-gauge Site, H = 242 m. Barometer, H_b = 237·3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground :—Thermometers, h_t = 0·9 m. Rain-gauge, h_r = 0·38 m. Vane of Anemometer, H_a = 15 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.			
			Vapour Pressure.		Percentage.													
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.						
1	981·5	975·6	81·8	86·2	87	79	10·8	14·8	96	98	160	5	210	11	10 \equiv	x 38·6	76	o. \equiv a. and p. \equiv^0 n.
2	973·4	975·2	86·2	86·0	90	x 86	14·3	13·1	95	88	210	7	180	6	10	8·2	86	\equiv^0 to 9 h. c. b. c. a. and p. o. to o. n.
3	978·4	980·8	85·7	81·1	91	81	12·1	10·0	83	93	220	4	—	1	6	2 ∞	4·3	83
4	978·2	979·7	87·1	87·6	91	85	14·5	13·7	91	83	150	4	170	6	10 \equiv	5·8	78	
5	981·3	982·9	88·2	88·0	91	x 86	14·7	15·2	86	90	190	9	190	10	10	2·9	86	o. \equiv q. early. p. to c. a. c. q. to o. p. p. and n.
6	984·8	989·2	87·5	85·0	89	84	12·8	12·2	78	88	210	7	230	3	8	5	85	d. early. o. to b. c. a. \equiv to b. c. to o. n.
7	990·5	996·8	86·3	83·4	89	80	11·1	9·5	73	76	290	9	270	2	3	2·5	83	\equiv to 8 h. b. c. to b. y. a. and p. b. c. q. to o. n.
8	994·5	993·6	85·6	87·2	88	81	12·7	14·9	88	93	200	6	200	5	9 ∞	0·6	77	d. a. \equiv^0 p. and n.
9	995·7	996·8	87·8	86·1	90	x 86	15·0	14·1	90	94	230	7	220	7	10 \equiv	0·2	86	• a. o. to b. c. p. b. \equiv^0 n.
10	995·5	992·8	85·1	86·0	89	85	12·8	14·3	91	96	210	8	210	3	10 \equiv	0·2	85	\equiv^0 a. o. p. \equiv^0 b. \equiv n.
11	988·6	991·7	88·9	84·3	x 93	83	15·2	10·5	85	79	230	7	20	3	9 \equiv	0·4	83	\equiv b. to 9 h. c. b. ∞ a. ∞ to o. g. p. • n.
12	995·2	996·3	82·1	80·3	83	80	10·3	9·5	89	93	60	5	30	6	10 \equiv	11·8	81	• \nwarrow 12 h. 39 m. T o. p. \equiv^0 n.
13	996·1	995·9	82·0	78·9	84	78	10·5	8·0	92	87	40	5	340	2	10	6	79	o. • a. o. p. o. to b. n.
14	996·2	998·9	83·7	76·3	87	75	9·0	6·7	71	87	70	3	—	1	4	0	73	b. b. c. y. a. c. y. z. p. b. c. b. y. p. b. \equiv^0 n.
15	1002·3	1002·1	83·4	77·3	88	73	8·0	6·7	64	81	—	0	—	0	0	0	69	\equiv^0 b. v. y. a. b. y. p. \equiv n. [p. n.
16	1002																	

5. GEOPHYSICS:—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.						Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 2·40.						
					Horizontal Comp't.		Declination.		Inclination.										
	0·3 m.	1·2 m.	Daily Mean.	Extremes.	Mean Time.		Mean Time.	West.	Mean Time.	North.	+	-	About 15 h.	About 15 h.	3 h.	9 h.	15 h.	21 h.	
1	a. 200+	a. 200+	cm. 206	cm. 207	h m ...	γ ...	h m ...	h m ...	h m ...	h m ...	o 2	o I	Coulomb. ...	Amp/cm ²	v/m. 145	v/m. 310	v/m. 235	v/m. 295	
2	87·4 87·9	87·5 87·5	206 207	...	...	...	...	...	...	...	2	I	...	...	190	175	145	235
3	88·5 89·8	87·4 87·4	206 204	...	10 55	18369	14 23	14 47·9	15 37	66 59·4	I	I	...	...	—	130	205	160
4	89·8 89·8	87·4 87·4	204 202	...	...	...	...	...	...	...	o	I	0·59	0·37	0·55	175	220	160
5	90·5 90·5	87·4 87·4	201 201	...	...	...	...	...	...	...	I	I	...	...	145	265	190	205
6	89·9 89·9	87·4 87·4	199 199	...	...	...	...	...	...	...	I	o	...	...	175	310	190	175
7	90·5 90·5	87·6 87·6	199 199	199	...	...	...	...	...	...	I	o	...	...	205	310	205	190
8	90·5 90·1	87·6 87·6	199 199	199	...	...	...	...	...	...	I	o	0·49	0·12	1·20	160	310	250
9	90·2 90·3	87·6 87·7	199 200	...	10 58	18358	14 22	14 46·1	15 20	67 0·4	I	I	0·98	0·33	2·80	145	380	175	
10	90·9 90·3	87·9 87·7	201 200	...	...	...	...	...	...	...	o	o	...	...	1·50	145	235	145
11	90·9 90·9	87·9 87·9	201 201	...	...	...	...	...	...	...	—	—	—	—	—	—	—	—
12	91·0 91·0	87·9 87·9	202 202	...	...	...	...	...	...	...	I	o	...	...	120	145	130	105
13	89·9 89·9	87·9 87·9	204 204	...	...	...	...	...	...	...	I	I	...	...	—	—	—	—
14	89·0 89·0	87·9 87·9	207 207	...	...	...	...	...	...	...	I	o	...	...	1·50	455	395	295
15	88·4 88·4	87·9 87·9	209 211	...	...	...	...	...	...	...	I	o	0·70	0·29	0·85	145	380	220
16	88·4 88·4	87·9 87·9	211 211	...	...	...	...	...	...	...	I	I	0·18	0·29	—	—	—	—
17	88·0 88·0	87·9 87·9	211 211	...	...	...	...	...	...	...	I	o	...	...	—	—	—	—
18	88·0 88·4	87·9 87·8	211 209	...	II 4	18376	14 27	14 43·3	14 46	67 0·0	I	o	0·29	0·23	0·85	205	280	175	205
19	88·4 86·0	87·8 87·7	209 207	2	I	0·10	0·33	0·45	120	220	190	355
20	86·0 85·6	87·7 87·7	207 206	2	I	—	235	280	145	220
21	85·6 85·6	87·7 87·7	205 205	I	I	—	175	220	130	295
22	85·0 85·7	87·2 86·7	205 202	I	o	—	235	295	175	190
23	85·8 85·0	87·5 87·2	204 203	I	I	0·47	0·04	0·85	—75	120	265	340
24	85·0 85·0	87·2 87·2	203 203	...	II 15	18402	14 21	14 47·5	14 37	66 57·3	I	o	0·35	0·35	1·05	60	175	220	265
25	86·0 86·9	86·9 86·9	203 203	I	I	—	120	145	90	355
26	86·9 86·9	86·9 86·9	203 203	I	o	—	220	265	145	205
27	85·7 85·7	86·7 86·7	202 202	I	o	—	—	—	—	—
28	84·7 83·2	86·7 86·7	203 207	o	o	—	220	295	175	—
29	83·2 82·7	86·7 86·4	207 208	o	o	0·43	0·39	1·00	355	—	175	455
30	82·7 82·7	86·4 86·4	208 204	—	—	—	—	—	—	—	o	o	0·49	0·45	1·05	235	410	175	380
M.	87·8 —	87·4 —	204 —	—	—	—	—	—	—	—	—	—	—	—	156†	272†	186†	247†	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

† 24 days only.

6. GEOPHYSICS:—ESKDALEMUIR.

Day.	North Component.			West Component.			Vertical Component.			Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 6·05.							
	Maximum. 15000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	Maximum. 44000 γ +.	Minimum. 44000 γ +.	Range.			3 h.	9 h.	15 h.	21 h.				
	h m	γ	γ	h m	γ	γ	h m	γ	γ	h m	γ	γ	v/m. **	v/m. **	v/m. **	v/m. **			
1	19 3 21 2	1025 1165	976 909	10 55 23 10	49 256	13 16 17 17	902 738	849 $\frac{6}{7} \frac{36}{31}$	53 202	3 11 20 50	1117 1183	1096 966	11 42 23 35	217	o 2	? 2 a I b	—20 60	30 185	—290
2	18 6 21 3	1029 1029	956 915	10 21 0 21	73 114	13 20 $\frac{13}{13} \frac{5}{52}$	930 919	760 797	o 15 1 13	170 122	19 15 17 15	1155 1149	1006 1004	o o 0 32	149	?	45 200	200 175	—180 340
3	18 6 23 18	1029 1018	949 949	10 21 11 54	69 69	13 20 13 11	930 905	760 846	o 15 23 34	170 59	19 15 17 10	1155 1129	1006 1098	o o 11 30	31	?	220 305	220 120	335 120
4	18 9 23 18	1043 1043	861 931	23 21 11 47	182 100	16 38 13 13	939 909	780 823	22 43 6 30	159 86	18 24 $\frac{16}{16} \frac{3}{31}$	1178 1104	951 1082	23 40 12 21	227 22	?	230 170	230 170	180 180
5	18 9 23 19	1043 1024	866 924	0 32 II 13	168 100	13 12 $\frac{13}{13} \frac{47}{54}$	924 908	765 840	1 14 6 53	148 68	19 9 18 54	1117 1098	1096 1069	o 26 2 35	208 29	?	210 305	210 225	175 175
6	18 21 21 32	1023 1034	957 935	11 40 11 8	81 99	13 12 14 10	924 914	845 839	2 33 0 2	60 75	18 25 16 40	1134 1126	1074 1075	2 15 1 6	23 51	?	175 140	175 120	340 180
7	17 23 21 32	1025 1034	954 919	21 54 0 47	85 271	14 17 10 10	914 919	781 837	2 29 19 21	160 82	18 22 19 16	1171 1151	1000 1081	21 31 10 26	171 70	?	110 110	150 150	225 395
8	17 23 22 23	1025 1053	754 945	21 54 12 48	85 108	17 48 14 23	988 899	661 802	2 29 22 51	97 97	17 14 17 14	1171 1101	1000 1055	21 31 24 0	171 46	?	140 160	140 95	180 85
9	17 23 23 28	1225 1048	754 777	21 54 0 47	85 271	17 48 10 10	988 935	661 738	2 29 0 7	97 197	16 44 16 32	1313 1159	857 839	22 8 0 50	456 320	?	150 150	150 150	325 325
10	17 23 21 4	1225 1043	754 905	21 54 1 48	85 138	17 48 1 54	988 919	661 798	2 29 1 16	97 121	16 44 15 50	1313 1113	857 983	22 8 2 25	456 130	?	150 160	150 185	325 185
11	17 23 21 4	1022 1043	948 905	12 13 1 48	74 138	15 49 1 54	917 919	816 798	3 20 1 16	60 121	16 44 15 50	1313 1113	983 983	3 6 2 25	456 130	?	150 160	150 185	325 185

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$ Heights above M. S. L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1.48 m. h_r = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.					Min. Temp. on Grass.	Percentage of Humidity.			Rain 0 h. to 24 h.	REMARKS.	Earth Current Character.		
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.		9 h.†	14 h.	21 h.	Mean.				
1	mb.	mb.	mb.	mb.	a.	a.	a.	a.	a.	200+	%	62	60	76	66	—	O	
1	1013.1	1011.5	1008.7	1001.1	88.6	90.4	89.9	91.6	83.5	88.8	78.4	96	98	93	96	x 25' 3	I	
2	1003.9	1002.5	1001.9	1002.8	88.2	93.1	90.5	94.0	88.6	90.9	83.8	85	80	95	87	—	I	
3	997.8	999.0	1003.6	1000.1	88.4	88.0	88.5	90.0	87.5	88.5	87.0	96	98	93	96	• 2 h. - 13 h.	I	
4	1005.8	1007.3	1009.1	1007.4	88.8	91.8	90.9	92.9	88.0	90.5	83.8	97	84	88	43	• 2 h	I	
5	1010.6	1007.3	1010.3	1009.4	92.5	97.7	90.8	98.4	89.6	93.8	86.6	70	57	86	71	✓ to N.E. 19 h. 30 m.	O	
6	1014.2	1015.5	1017.5	1015.7	90.9	92.3	87.7	93.1	86.2	90.0	83.8	89	78	95	87	—	2	
7	1020.1	1020.1	1021.0	1020.4	89.8	92.1	86.7	92.7	85.4	89.3	77.6	76	62	95	78	• 2 morning.	I	
8	1021.8	1021.4	1021.7	1021.6	89.6	92.0	88.3	93.0	85.6	89.7	81.5	86	79	95	87	• 4 h.	O	
9	1022.6	1022.1	1021.7	1022.1	87.6	95.2	89.8	95.6	86.5	90.9	80.6	98	71	84	84	• 2 h. - 10 h. Cloudless sky afterwards.	2	
10	1020.5	1018.7	1016.7	1018.6	90.2	99.0	93.0	99.7	87.9	94.0	85.4	75	57	80	71	Cloudless day.	I	
11	1014.0	1012.3	1011.4	1012.6	94.7	99.8	94.1	100.5	91.1	96.0	84.7	63	55	67	62	Cloudless day.	I	
12	1011.4	1010.6	1010.6	1010.9	93.0	97.0	88.7	98.6	88.2	93.1	84.5	72	65	86	74	Fine morning. Ci. from S.W. after 11 h.	O	
13	1010.3	1009.3	1008.9	1009.5	94.7	93.2	91.0	96.2	87.5	92.5	86.0	97	78	92	89	• 1 h. - 9 h. 30 m. ✓ to E. and S.E. 20 h.	O	
14	1010.9	1010.3	1012.9	1011.4	90.0	94.9	89.7	95.6	88.3	91.7	86.4	93	73	91	86	• 0 h. ✓ to E. 20 h.	I	
15	1016.9	1017.8	1019.8	1018.2	90.5	92.5	89.0	93.0	88.7	90.7	87.8	88	77	87	84	—	I	
16	1022.1	1021.7	1022.5	1022.1	90.0	92.7	88.6	92.8	88.2	90.5	85.7	79	69	85	78	—	I	
17	1023.1	1022.3	1022.6	1022.2	90.7	93.2	87.7	93.3	87.5	90.5	86.2	73	70	89	77	Cloudless afternoon.	O	
18	1016.0	1012.1	1008.6	1012.2	90.4	93.4	88.0	94.0	86.2	90.4	81.3	75	63	98	79	Cloudless sky to 20 h. 30 m.	I	
19	1005.0	1005.1	1006.3	1005.5	87.0	87.0	84.4	89.3	83.0	86.1	81.3	68	61	59	63	• 5 h. [19 h. 45 m.	2	
20	999.1	998.3	999.1	998.8	80.0	80.5	84.0	n 84.4	n 80.0	81.8	75.0	91	78	55	75	• 2 h. 30 m. ▲ 7 h. 45 m. Showers.	I	
21	1003.3	1003.5	1004.2	1003.7	83.6	86.6	82.5	87.5	81.0	84.2	77.6	69	56	70	34	• 2 h. 40 m. - 5 h.	I	
22	999.8	997.9	997.7	998.5	84.2	88.9	88.0	89.4	82.3	86.6	75.7	93	69	82	81	• 6 h. continuous.	I	
23	993.9	995.4	999.0	996.1	89.1	90.0	86.0	91.0	86.1	88.4	84.0	76	78	96	83	• 0 h. 20 m. • 2 h. 18 h.	I	
24	1006.7	1008.9	1011.8	1009.1	87.6	89.2	85.9	90.1	84.3	87.4	80.0	71	60	75	69	• 5 h. 30 m. • noon.	2	
25	1014.1	1014.5	1013.8	1014.1	88.3	88.7	88.3	89.6	86.5	88.3	83.0	92	92	87	90	• 0 h. 30 m. • noon.	I	
26	1009.7	1008.9	1009.3	1009.3	89.1	89.6	85.9	90.3	84.9	88.0	86.0	83	81	96	87	• 0 h. 8 h. • 2 h. 20 h.	I	
27	1009.3	1008.7	1008.9	1009.0	85.7	85.2	84.0	86.5	84.0	85.1	81.2	67	69	66	67	—	O	
28	1008.3	1009.5	1014.3	1010.7	84.3	85.3	84.5	86.1	83.6	84.8	80.3	65	50	50	55	—	O	
29	1020.8	1018.6	1018.1	1019.2	85.0	86.5	82.8	87.6	81.0	84.6	74.2	53	n 49	75	59	—	O	
30	1011.7	1007.8	1003.8	1007.8	85.0	86.9	84.4	87.6	81.9	85.2	n 72.4	64	54	81	66	• 3 h. 45 m.	O	
Means	1011.2	1010.6	1011.1	1010.9	88.6	91.1	87.8	92.1	85.8	89.1	81.8	78.9	69.1	82.3	76.8	51.6	—	O .8
Normal	1011.8	1011.3	1011.7	1011.6	88.6	90.8	87.7	91.7	85.8	88.9	81.8	—	67.3	80.4	—	61.0	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).				Mean of Force.	Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.												Mean Amount.		
						Sunshine.*		Upper.		Lower.		Upper.		Lower.		Upper.				
	Wind Direction and Force (0-12 on the Beaufort Scale).		Total.	Per cent. of Possible.		Tenths.	Type.	Dirac-	Type.	Dirac-	Tenths.	Type.	Dirac-	Type.	Dirac-	Tenths.	Type.			
9 h.†	14 h.	21 h.	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†			
1	225	2	203	4	225	4	3'3	13.1	97	2	...	Cu.	SW	4	A.-Cu.	WSW	Cu.	WSW	8	
2	180	4	203	3	225	2	3'0	3.8	29	8	...	Cu.-Nb.	SSW	8	...	...	...	...	8.7
3	23	3	315	3	247	3	3'0	0.0	0	10	...	Nb.	...	10	...	...	Nb.	...	9.3
4	180	4	203	4	203	4	4'0	0.7	6	10	...	Nb.	S	9	...	St.-Cu.	SW	9.7		
5	157	3	203	2	315	3	2'7	10.0	70	1	A.-Cu.	SW	...	4	Ci.-Cu.	SSW	Cu.-Nb.	...	3.7	
6	270	3	225	3	293	1	2'3	5.7	44	8	A.-Cu.	SW	6	Ci.-A.-Cu.	SW	Cu.-Nb.	W	5.0		
7	247	2	315	3	315	1	2'0	11.7	89	3	...	Cu.	WSW	5	...	...	...	...	2.7
8	247	1	23	1	23	2	1'3	6.3	49	4	...	{ Cu.	NW	8	...	...	St.-Cu.	...	5.0
9	67	1	23	2	67	3	2'0	8.0	62	10	...	{ Cu.-Nb.	NW	0	...	...	...	...	3.3
10	67	3	67	2	67	3	2'7	12.9	100	0	...	...	...	0	...	...	...	...	0.0
11	113	2	113	2	225	2	2'0	12.9	100	0	...	...	...	0	...	...	...	...	0.0
12	203	3	225	2	45	3	2'7	9.6	1	10	...	Ci.	...	5	...	...	...	...	2.0
13	135	2	225	1	67	3	2'0	5.9	46	10	...	...	...	3	Ci.	SW	...	...	5.3
14	67	3	67	3	45	5	3'7	10.0	79	10	...	...	...	1	Ci.	...	...	...	6.3
15	45	4	67	5	67	4	4'3	3.1	25	10	...	Cu.-Nb.	ENE	6	...	...	Cu.-Nb.	E	7.7
16	90	3	67	3	67	3	3'0	7.2	57	7	...	Cu.-Nb.	E	6	...	...	Cu.	E	7.7
17	90	3	45	3	67	3	3'0	9.9	79	6	...	Cu.-								

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 8·8 m., Ground 13·7 m., M.S.L. 19·2 m.
Height of Cups above—Roof 4·6 m., Ground 7·6 m., M.S.L. 15·2 m.

Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.	
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.			
1	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	h	m									
2	6·0	...	4·0	...	8·2	...	3·4	...	9·4	...	3·9	...	9·4	...	3·9	...	18·0	13 50	
3	4·7	...	3·1	...	3·1	...	4·7	...	5·7	...	2·4	...	4·8	...	2·0	...	12·7	16 45	
4	3·2	...	2·2	...	1·3	...	0·9	...	2·6	...	0·5	...	0·3	...	1·6	...	9·2	0 40	
5	3·0	...	...	...	9·4	...	...	...	3·9	7·6	...	3·1	6·1	...	2·5	...	19·1	10 45	
6	7·2	...	...	...	8·0	...	1·6	...	9·1	...	3·8	...	7·3	...	3·0	...	17·5	15 50	
7	3·7	...	3·7	...	2·5	...	6·1	...	3·3	...	3·3	...	2·9	...	4·3	...	12·8	10 25	
8	3·7	...	3·7	...	3·0	...	7·3	...	2·5	...	1·7	...	Calm	...	Calm	...	11·7	8 50	
9	2·5	...	2·5	...	1·3	...	3·0	...	5·5	...	3·7	...	4·5	...	1·9	...	10·8	18 45	
10	4·9	...	3·3	...	5·7	...	2·4	...	5·2	...	2·1	...	3·3	...	1·4	...	12·3	12 5	
11	3·6	...	1·5	...	5·1	...	1·0	...	2·5	...	2·5	...	6·8	...	4·6	...	14·0	18 0	
12	9·8	...	6·6	...	8·6	...	8·6	...	5·4	...	8·1	...	4·0	...	9·7	...	16·5	2 30	
13	2·3	...	11·6	...	2·0	...	10·3	...	3·3	...	7·9	...	2·9	...	6·9	...	15·0	0 30	
14	1·4	...	7·1	...	1·6	...	8·0	...	3·8	...	5·7	...	5·3	...	5·3	...	10·8	9 20	
15	1·2	...	6·1	...	1·2	...	6·1	...	0·7	...	3·5	...	Calm	...	9·2	...	7·0	40 40	
16	...	Calm	...	...	...	...	1·6	...	4·0	...	Calm	...	7·0	...	7·0	...	8·8	14 15	
17	1·3	...	0·9	...	2·2	...	1·4	...	3·8	...	1·8	...	2·6	...	2·7	...	8·8	14 15	
18	3·7	...	3·7	...	4·6	...	6·8	...	...	8·9	...	2·3	11·6	...	18·8	...	23 45		
19	10·5	10·5	...	15·2	6·3	...	13·1	2·6	...	7·6	5·1	...	23·3	...	12 10	...	10·8		
20	10·6	7·1	...	13·7	5·7	...	10·9	7·3	...	14·0	5·8	...	22·5	8	35	...	10·6		
21	11·2	4·6	...	9·0	6·0	...	3·7	3·7	...	1·0	5·1	...	20·3	0	25	...	11·2		
22	4·2	...	6·2	...	3·7	...	5·5	...	2·3	...	11·7	...	6·4	2·6	...	17·4	12 35		
23	4·7	...	4·7	...	8·5	...	3·5	...	6·1	1·2	...	3·3	1·4	...	14·1	8 0			
24	5·6	...	7·6	...	7·6	...	3·5	...	8·5	3·1	...	7·6	7·6	...	19·9	11 10			
25	1·5	7·4	...	4·2	6·2	...	6·5	...	6·5	9·6	...	6·4	9·8	...	22·3	22 35			
26	10·6	7·1	...	9·8	...	2·4	11·9	...	9·0	9·0	...	22·0	11	10	...	10·6			
27	6·0	6·0	...	3·7	3·7	...	3·8	2·6	...	6·6	...	13·8	23	15	...	6·0			
28	5·6	...	7·4	...	1·5	...	4·5	...	0·9	1·4	1·4	...	12·4	2	15	...	5·6		
29	2·4	5·7	4·9	7·4	8·1	...	8·1	6·7	...	6·7	6·7	...	19·0	14	25	...	2·4		
30	5·6	5·6	6·6	4·4	7·4	...	1·5	7·2	...	5·2	...	14·8	22	55	...	5·6			
S+N&W+E	135·1	130·5	157·5	148·1	149·8	137·9	142·3	115·6											
S-N&W-E	8·5	58·3	9·7	61·1	24·2	85·7	3·1	59·4											

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1·5 m., Ground 4·9 m., M.S.L. 57·3 m.

Day.	3 h.				9 h.				15 h.				21 h.				Vel. in Max. Hourly Run.	Time of Max.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.		
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	?	?
2	...	...	Ca lm	...	...	2·5	...	...	1·7	2·6	...	0·5	3·2	...	2·2	4·3	23	
3	3·2	...	2·2	...	1·3	...	0·9	...	0·6	4·9	...	1·6	...	...	...	...	5·6	8
4	...	...	Ca lm	...	...	0·7	...	0·5	...	3·5	...	...	...	...	...	...	?	?
5	4·5	...	4·5	...	6·7	...	0·9	...	5·6	...	2·8	5·2	...	3·4	10·0	20		
6	7·9	...	7·9	...	7·9	...	7·9	...	7·9	...	7·9	...	7·9	...	7·9	...	8·9	2
7	6·5	...	6·5	...	6·5	...	6·5	...	6·5	...	6·5	...	6·5	...	6·5	...	7·5	14
8	5·8	...	5·8	...	5·8	...	5·8	...	5·8	...	5·8	...	5·8	...	5·8	...	6·8	10
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7·8	24
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8·5	1
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9·8	10
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9·5	9
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	23
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	12
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	25
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	0
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	40
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	12
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	0
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	40
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	14
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	35
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	15
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	25
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	0
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	40
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	14
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	30
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	13
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10·4	20
S+N&W+E	103·1	102·9	118·6	96·8	125·3	108·9	114·0	91·0										
S-N&W-E	2·7	22·3	-28·2	-2·0	-28·3	-0·9	-18·2	-9·8										

ENGLAND E.:—SHOEBURYNESS.*

Height of Head above—Ground 27·4 m., M.S.L. 31·4 m.

Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.
	S.	N.	W.	E.	S.	N.	W											

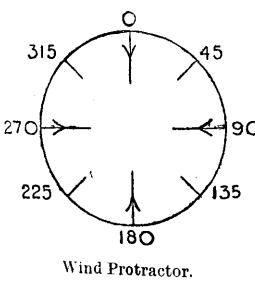
9. SEISMOLOGICAL DIARY.

EARTHQUAKES :—ESKDALEMUIR.											MICROSEISMS OF N. COMPONENT :—ESKDALEMUIR.							
Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ .	Remarks.	0 h.		6 h.		12 h.		18 h.			
				A _{N.}	A _{E.}	A _{Z.}			A _{N.}	T.	A _{N.}	T.	A _{N.}	T.	A _{N.}	T.		
I		h m s 20 30 to 21 30	s ...	μ	μ	μ	km.	Slight disturbance.	μ	s	μ	s	μ	s	μ	s		
				...	...	...			0'7	4	0'7	4	0'7	4	0'9	4
6	i _E	9 47 34	...	...	...	...		Slight disturbance.	1'1	4	1'1	4	1'0	4	0'9	4
	i _S	9 47 39	...	...	...	...			0'9	4	0'8	4	0'9	5	...	...
	L	9 57	19	...	...	...			...	...	...	...	1'0	5	1'2	4
	F	10 52	...	...	...	...			1'1	4	0'9	4	0'5	5	0'1	4
				...	...	...			0'2	4	0'3	4	0'3	3	0'6	4'5
				...	...	...			1'5	8	1'5	7	1'5	6	1'4	6
				...	...	...			1'1	5	0'9	5	0'3	5	0'3	5
10		17 5 to 17 18	...	...	...	...		Slight disturbance.	0'6	4	0'9	4	0'9	4	1'1	4
				...	...	...			0'9	5	0'9	4	0'8	4	0'8	4
				...	...	...			0'9	5	0'9	4	0'3	4'5	0'4	3'5
				...	...	...			0'4	4	0'3	3	0'2	4	0'2	4'5
				...	...	...			0'2	4	0'1	3	0'1	4	0'1	4
				...	...	...			0'1	4	0'4	6	0'7	5'5	0'8	6
				...	...	...			0'8	5	0'9	6	0'8	6	0'7	5
12		6 40 to 8 26	...	...	...	...		Prolonged slight disturbance, including several groups of long waves of low amplitude and 17 seconds period.	2'3	4	2'3	4	1'8	5	1'1	5
				...	...	...			1'1	4	1'1	4	1'8	4	1'4	4
				...	...	...			1'0	5	1'1	4	1'0	5'5	1'2	5'5
				...	...	...			1'4	4	1'2	4	1'8	5	1'9	5
				...	...	...			2'4	4	1'5	5	2'0	5	1'4	4
				...	...	...			1'2	4	0'9	5	0'9	5	0'6	6
				...	...	...			0'9	5	1'8	5	2'0	5	2'4	5
12		14 to 15 30	...	...	...	...		Slight disturbance.	3'9	4	2'6	5	3'0	4'5	1'8	5'5
															
															
															
															
															
															
13	i _L	12 43 11	...	...	...	...		Slight disturbance.	2	16	2	16	2	16	2	16
		13 2	16	...	...	...			35	...	35	...	35	...	35	...
															
															
															
															
															
EARTHQUAKES :—RICHMOND (KEW OBSERVATORY).											Times, G.M.T. of							
15	P	17 53 28		Slight disturbance in progress; record almost entirely masked by microseisms and large wind effects.	18 11	...	18 40	...	19 13	...	19 13	...	19 13	...
	L	18 11			18 16	4	18 21	5	18 21	4	18 21	5	18 21	4
	M _N	18 18 16	18			19 21	5	19 21	5	19 21	5	19 21	5	19 21	5
	M _E	18 19 21	18			19 21	5	19 21	5	19 21	5	19 21	5	19 21	5
	F	19												
															
															
19		13		Moderate disturbance. Record confused with microseisms and wind effects.	h m	h m	h m	h m	h m	h m	h m	h m	h m	
		
		
		
		
		
		
26	P	9 30 52		Moderate disturbance. Record confused with microseisms and wind effects.	9 55	13	10 40	20	10 40	20	10 40	20	10 40	20
	L	9 55	13			10 13	20	10 40	20	10 40	20	10 40	20	10 40	20
	M _N	10 1 13	20			10 40	20	10 40	20	10 40	20	10 40	20	10 40	20
	F	10 40	20												
															
															
															
26		20 20 to 21 50		Succession of very small waves.	9 34	10 4	10 4	10 4	10 4	10 4	10 4	10 4	10 4	10 4
						20 23	20 49	20 49	20 49	20 49	20 49	20 49	20 49	20 49	20 49

Means for Month $\{ A_N = 1'1, T = 4'7 \}$ Normals, 1911-18 $\{ A_N = 0'7, T = 4'9 \}$

10. SOUNDINGS WITH PILOT BALLOONS.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.														Cloud Observations.							
		Geostrophic.		By Anemometer.		At Heights above M.S.L.										Time, G.M.T. h. m.		Type.	Deg. from N.	mr/s.	Type.	Deg. from N.	
		Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	mr/s.						
ABERDEEN.																							
9 16	12 0 12 0	260 250	9 6	225 165	0.5 2.5	255 225	2.0 5.0	270 270	7.5 1.5	275 250	31.0 8.5	...	...	...	...	13 0 12 0	St-Cu. ...	275 ...	7.0 ...	... cloud less	... ...	
ESKDALEMUIR.																							
14 14 15 15	7 25 17 30 7 15 12 0	?	?	10 45	3.0 1.0	40 70	6.0 2.8	60 25	6.0 2.1	60 360	1.6 4.5	...	...	...	...	...	Cu. Cu.	...	...	Ci. A-St.	...
15 16 16 17	17 35 7 35 12 15 12 25	?	?	130	2.0	155	2.7	115 130	2.7 3.0	115 270	4.8 2.1	275 245	0.8 2.2	325 90	1.8 2.2	75 90	2.2 2.2	...	...	...	...
19 21 22 23	17 20 7 15 17 30 7 25	330 340 300 360	13 14 17 8	325 210 290 360	7.5 3.0 7.5 2.0	325 300 300 345	10.5 5.0 6.5 6.0	230 235 235 260	4.0 6.5 7.0 5.5	195 245 225 250	3.8 4.1 3.1 5.5	245 240 255 265	1.0 4.5 6.0 6.0	320 340 285 280	2.0 19.0 8.5 8.5	...	...	...	...
23 27 27 28	17 25 7 25 12 20 7 30	315 315 315 325	8 8 6 6	280 285 305 calm	5.5 2.5 3.5 -	300 310 320 350	6.0 4.0 2.5 4.0	325 320 330 350	6.0 5.0 5.0 5.0	325 320 315 330	9.0 5.0 7.0 6.0	305 290 305 335	11.5 11.0 14.0 15.5	...	...	...	...	Ci-St. A-St. Cu. cloud less	315 ...		
15 15 15 21 23	7 15 12 0 17 35 7 15 7 25	(For observations at lower levels, see above.)								5000 m.	6000 m.	7000 m.	8000 m.										
15 15 15 21 23	7 15 12 0 17 35 7 15 7 25									15 30 50 345	6.0 5.5 3.8 26.0	20 ...	10.0 ...	40 ...	13.0 ...	60 ...	16.5 ...	...	...	...	...
15 15 15 21 23	7 15 12 0 17 35 7 15 7 25									305	15.5	...	...	...	...	...	...	...	...	...	...
S. FARNBOROUGH.																							
1 3 4 5	6 30 14 25 235 6 25	240 ? ? 225 220	7 ?	200 calm	2.7	225 135	7.0 2.9	225 130	7.5 5.0	275 165	7.5 6.5	290 ...	9.0 ...	...	...	...	St-Cu. Nb., Cu-Nb. St-Cu., Fr-St. Nb.	...	...	A-St. A-St.	...
6 9 10 11	6 30 6 30 10 0 6 40	290 ? ? ? ? 225	5 ?	calm	275 250 240 160	5.0 3.4 3.9 2.7	265 275 225 210	7.5 2.8 6.5 6.0	240 275 225 205	10.0 3.8 11.5 9.5	...	...	...	...	...	...	...	St-Cu.	...	...	...
12 17 18 19	6 35 9 15 16 50 6 40	215 ? ? 270 315	50 ?	calm	205 15 215 300	12.0 1.5 6.0 4.5	215 25 225 310	10.5 7.5 6.5 14.0	215 305 205 310	10.5 3.8 11.5 12.5	240 305 205 190	10.0 5.5 12.5 12.5	275 220 215 215	8.5 6.5 7.0 7.0	...	...	...	...	...	...	...
20 24 27 29	6 40 6 30 6 40 7 15	310 ? ? 325 ?	5 ?	calm	245 255 350 285	10.5 3.8 9.0 1.9	245 265 345 290	8.5 5.0 7.0 3.5	265 255 295 355	10.0 11.5 8.5 4.8	300 275 280 355	9.5 13.5 10.0 4.4	300 270 320 320	11.5 16.0 8.0 8.0	...	...	...	...	A-Cu. A-St., Ci-St. A-Cu. A-Cu.	...	...
9 10 11 17	6 30 10 0 6 40 9 15	(For observations at lower levels, see above.)								5000 m.	6000 m.	7000 m.	8000 m.	9000 m.	10,000 m.								
9 10 11 17 18 29	6 30 10 0 6 40 9 15 16 50 7 45									270 210 200 325 270 350	10.5 9.0 11.5 2.8 7.5 10.0	280 200 215 ...	13.0 9.0 5.0	285 220 215 ...	14.5 6.5 9.0	285 210 215 ...	15.5 9.0

Height of Station above M.S.L.=H.,
Anemometer above ground=h.Aberdeen 14 m. 32 m.
Eskdalemuir 242 m. 15 m.
S. Farnborough 70 m. 31 m.
Cahirciveen 9 m. 13 m.

September 1919.

During the whole month there was a persistent anticyclone over the Azores region.

1st, 7 h. Ridge extending from the Azores to the Baltic; Low centred N.W. of Ireland.
 2nd, 18 h. Shallow Low covering the British Isles, centred N. of Ireland.
 3rd, 7 h. " " " ; secondary over N.W. France.
 13 h. " " " ; secondary over N.W. Ireland.
 4th, 7 h. Low centred W. of Ireland.
 5th, 7 h. " N.W. of Ireland.
 6th, 7 h. Anticyclone extending from the Azores to Russia; shallow Low S. of Iceland.
 7th, 7 h. " deep depression S. of Iceland.
 9th, 7 h., 13 h. Anticyclone centred S. of the British Isles.
 10th, 7 h., 13 h. } Anticyclone centred over Central Europe.
 11th, 7 h. High over the British Isles.
 12th-17th. Low centred near Bergen.
 18th, 18 h. Low centred near the Orkneys.
 19th, 7 h. Low centred near Christiania.
 20th, 7 h. Low centred near Christiansund.
 21st, 7 h. " Aberdeen.
 22nd, 18 h. " Skudenesas: secondary over the Bristol Channel.
 23rd, 7 h. " Christiansund, " Bay of Biscay.
 24th, 7 h. " the Faroe.
 26th, 7 h. " the Shetlands.
 27th-28th. The Azores anticyclone covering the British Isles.
 29th, 7 h. Deep depression S.W. of Iceland; ridge across the British Isles.

Notes on Ascents.

Aberdeen—
6th, 12 h. Barometer unsteady.Eskdalemuir—
14th, 17 h. 30 m. Exceptional visibility.
15th, 7 h. 15 m. Balloon seen with the naked eye when at a height of 20,000 ft. Hoar frost on the ground.S. Farnborough—
5th, 6 h. 25 m. Nb. and rainbow to S.W.
10th, 10 h. Foggy at commencement of ascent, clearing later.
20th, 6 h. 40 m. Solar halo.
29th, 7 h. 15 m. Ground mist.

Cahirciveen—
6th, 12 h. Sky clouded over very rapidly.
26th, 7 h. 45 m. There were probably convection currents during parts of ascent.

10. SOUNDINGS WITH PILOT BALLOONS—continued.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.												Cloud Observations.								
		Geostrophic.		By Anemometer.		At Heights above M.S.L.								Cloud Observations.								
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.	1000 m.	2000 m.	3000 m.	4000 m.	Deg. from N.	m/s.	Deg. from N.	m/s.	Time, G.M.T. h. m.	Type.	Deg. from N.	m/s.	Type.	Deg. from N.		
CAHIRCIVEEN.																						
2	17 10	260	15	250	5°	260	7°	260	9°	265	7°	265	9°	...	...	...	Cu.	270	...	Gi-St.	180	...
3	7 45	240	10	160	10°	185	9°	190	10°	215	12°	210	10°	205	9°	...	Cu.	180	...			
7	7 20	?	?	360	4°	345	9°	345	9°	305	6°	305	12°	290	10°	...	Cu.	360	...			
10	7 40	230	13	160	5°	185	13°	195	22°	250	8°	...	...	...	...	...	...	...	...	cloud less		
10	12 15	240	9	160	10°	190	13°	200	22°	245	6°	215	18°	...	...	...	...	...	...	cloud less		
13	7 25	60	16	45	8°	30	11°	25	15°	40	5°	330	2°	...	...	...	Cu.	45	...	Ci., Ci-Cu.	225	...
15	7 25	?	?	30	1°	50	5°	50	6°	45	4°	30	4°	20	7°	...	...	...	...	cloud less		
16	7 25	?	?	calm		...	...	160	5°	25	3°	355	3°	40	6°	...	A-Cu.	...	...	A-Cu.	...	...
21	7 30	325	10	calm		345	2°	300	5°	315	8°	320	6°	330	21°	8 25	Cu., St-Cu.	...	A-Cu.	350	4°	
23	16 25	315	9	320	5°	340	5°	335	7°	315	9°	...	...	...	...	...	Cu-St.	335	...	Gi-Cu.	360	...
26	7 45	310	15	320	6°	310	13°	300	14°	275	17°	...	...	...	...	...	Cu.	295	...			
27	12 5	?	?	45	4°	355	10°	345	10°	340	11°	...	...	...	...	...	Cu.	340	...	A-Cu.	340	...
27	16 20	?	?	355	8°	350	11°	345	13°	340	13°	335	13°	335	19°	...	Cu.	340	...	A-St-Cu.	350	...
28	7 50	?	?	calm		...	...	340	8°	350	11°	...	...	...	...	...	Cu. & St-Cu.	340	...	A-St-Cu.	350	...
		(For observations at lower levels, see above.)		5000 m.		6000 m.		7000 m.		8000 m.		9000 m.		10,000 m.								
7	7 20																Cu.	360	...	...	...	...
15	7 25																...	...	...	cloud less	...	...
16	7 25																A-Cu.	...	...	A-Cu.	...	...
21	7 30																A-Cu.	350	4°			

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN.

Day and Hour G.M.T.	Type of Cloud.	Velocity-height-ratio.					Remarks.	
		Degrees from N.	Milliradians per Second.	Components.		W.-E.	S.-N.	
2 13	Ci-Cu.	192	mr/s.	mr/s.	mr/s.	+ 1°	+ 5°	Ci-Cu. bands, opened from A-St. sheet.
3 13	Cu.	225	10°	+	+	7°	7°	
4 16	St-Cu.	179	4°	-	+	0°	4°	Thin fused St-Cu.
5 18	St-Cu.	198	7°	+	+	2°	6°	High fused St-Cu.
6 13	Cu.	235	12°	+	+	9°	6°	
8 13	Ci-Cu.	273	6°	+	+	6°	3°	Rather indefinite Ci-Cu. sheets.
9 13	St-Cu.	276	7°	+	+	7°	7°	A-Cu. to high St-Cu.
10 7	Ci-Cu.	265	3°	+	+	3°	3°	Sheets of Ci-Cu., rapidly dispersing.
12 13	A-Cu.	244	6°	+	+	5°	2°	A-Cu. partially formed, fused again later into A-St.
13 13	St-Cu.	305	2°	+	+	2°	1°	Low layer of St-Cu.
17 13	A-Cu.	272	4°	+	+	0°	1°	Sheets of "false" Ci. forming incipient A-Cu.
18 13	Cu.	255	6°	+	+	1°	7°	
19 13	Cu-Nb.	330	12°	+	+	10°	8°	Main mass of cloud measured.
25 13	{ A-Cu. Cu.	275 285	3° 7°	+	+	0°	3°	Small quantity of A-Cu. above, with Cu. below.
						- 1°	8°	

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Station.	Aurora Observations.	
			Eskdalemuir.	Richmond.			Remarks.
2	...	D	...	...	Aberdeen	Faint glow, 21 h.-22 h.	
2	p.	...	2, I	2, I	Dublin (city) Cahirciveen Deerness Wick	22 h. Glow, 23 h.	
3	p.	...	I, I	I, I	Inverness Aberdeen Paisley	Faint arch, 21 h.-24 h.	
6	p.	...	I, I	I, I	Aberdeen	Moderately faint, streamer curtain, greenish, 21 h.-24 h.	
9	p.	...	I, I	I, I	Edinburgh		
10	...	O	...	...	Aberdeen	Faint arch and glow, late n.	
10	p.	...	I, I	I, I	Paisley		
11	p.	...	I, O	I, O	Deerness	Faint, 21 h.	
13	p.	...	I, O	I, I	Seskin (Carrick-on-Suir)	Faint arch and streamers, 21 h. onwards	
14	p.	...	O, I	I, I	Aberdeen	Faint glow, n.	
					Fort William		
16	...	C	...	...	Paisley		
16	p.	...	I, I	I, I	Aberdeen Arbroath Edinburgh Eskdalemuir	Bright arch and streamer curtain, 20 h.-23 h	
					Stonyhurst		
19	p.	...	2, 2	2, 2	Hutton (Preston) Meltham (Yorks) Worksop Raunds Ross-on-Wye	Streamers, 21 h.	
					Oxford	Brilliant streamers, 21 h. 10 m.	
					Aberdeen	21 h. 15 m.	
20	p.	...	2, I	2, I	Braemar Fort William	21 h. One very fine streamer, 21 h. 20 m.	
					Edinburgh	Orange rays and streamers in N. and N.W., 21 h. 30 m.	
					Paisley	Very bright, with streamers, ten or more at times, 21 h.	
22	p.	...	I, I	I, I	Eskdalemuir	Glow seen between clouds during n.	
					Oxford		
					Eskdalemuir		
23	...	...	I, 2	I, 2	Deerness	21 h.	
					Aberdeen	Glow, 20 h. 45 m.-21 h. 15 m.	
					Eskdalemuir	Faint glow, 21 h.	
					Seskin (Carrick-on-Suir)		
24	...	●	...	...	
24	p.	...	2, I	2, I	Aberdeen	Glow seen between clouds, 21 h.-22 h.	
					Rhyl	Glow, 21 h.	
26	p.	...	I, O	I, O	Guernsey	Faint, 22 h.	
27	p.	...	O, O	O, O	Rothesay	Moderately faint glow behind clouds, n.	
						24 h.	
29	p.	...	O, O	O, O	Baltasound		

Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at midnight of the night in question.



METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—*Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.*

Ninth Year.—No. 10. OCTOBER 1919.]

Units based on the C.G.S. System.

[Price 1s.]

1. SUNSHINE AND SOLAR RADIATION.

WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.				RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.				ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.				CAHIRCIVEEN.						
Day.	Bright Sunshine.*	Radiation received on Horizontal Surface by Calendar Radiograph.				Radiation at Noon by Ångström Pyrheliometer.				Radiation by Ångström Pyrheliometer.				Bright Sunshine.*						
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.		Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	$\frac{p}{P}$ sec Z.	Intensity.	Total.	Per cent. of Possible.	
					Amount.	Time.			mw/cm².								mw/cm².	hr.	%	
1	3'0	26	597	29	43	10	55	42	4'5	39	...	...	0'6	5	...	...	...	8'4	72
2	3'0	26	569	28	x 52	10	32	31	4'0	35	...	...	x 9'1	79	...	...	...	1'3	11
3	8'2	71	x 1073	53	48	II	47	48	x 9'8	85	61	35	Clear	0'0	0	...	...	4'3	37
4	5'8	51	786	40	42	II	20	40	8'1	71	33	19	Hazy	0'0	0	...	...	0'0	0
5	0'0	0	237	12	13	13	10	12	0'0	0	...	...	0'0	0	...	...	...	0'0	0
6	0'0	0	389	20	24	13	21	14	1'4	12	...	...	0'0	0	...	...	...	1'8	16
7	4'4	40	646	34	x 52	II	15	42	4'3	38	32	17	Hazy	8'7	78	8'2	73
8	7'3	66	927	50	40	II	24	39	7'8	70	64	35	Clear	6'2	56	6'1	55
9	5'9	54	714	39	x 52	13	0	43	6'7	60	72	39	Clear	7'1	65	x 9'5	86
10	1'2	10	624	34	50	10	35	39	1'3	12	...	...	0'0	0	...	...	...	1'2	10
11	4'0	37	626	35	x 52	13	25	47	4'5	41	...	...	6'3	58	...	...	...	1'9	17
12	0'0	0	316	18	34	10	23	16	0'0	0	...	...	1'1	10	...	...	...	2'3	21
13	7'8	73	705	41	50	II	45	x 50	7'4	69	...	...	1'6	15	...	...	...	7'8	72
14	2'7	25	689	41	49	II	50	36	3'0	30	...	...	6'3	60	...	...	...	4'4	41
15	5'2	49	694	42	50	II	56	x 50	5'8	54	53	27	Thro' Ci.	8'4	80	...	...	2'2	22
16	x 8'3	78	805	49	41	II	15	40	8'9	84	...	...	6'8	65	...	...	...	4'9	46
17	8'1	76	727	45	37	II	50	37	7'5	71	58	29	Thro' Ci.	0'0	0	...	...	0'2	1
18	0'3	2	398	25	30	12	55	27	2'4	23	...	...	0'0	0	...	...	...	3'2	30
19	0'0	0	357	23	21	11	50	21	5'1	49	...	...	0'1	1	...	...	...	0'0	0
20	0'7	6	400	26	34	12	35	30	1'8	17	16	7	Thro' Ci.	0'0	0	...	...	0'0	0
21	3'0	29	448	30	33	12	55	32	3'7	36	45	21	Thro' Ci.	5'4	54	...	...	6'0	58
22	4'8	47	526	35	34	12	17	34	5'2	50	56	26	Clear	1'5	15	...	...	0'4	3
23	4'1	40	529	36	34	12	50	31	3'3	32	60	28	Clear	0'0	0	...	...	0'0	0
24	0'0	0	n 126	9	8	II	20	6	0'0	0	...	...	0'0	0	...	...	...	3'0	30
25	0'0	0	233	17	24	12	25	24	0'0	0	...	...	8'7	89	...	...	...	7'5	75
26	4'5	45	504	36	34	12	35	30	5'0	50	54	24	Clear	8'7	90	...	...	3'3	33
27	2'1	21	287	21	30	9	42	22	2'5	25	46	20	Thro' Ci.	7'5	78	...	...	4'4	44
28	4'2	42	493	37	33	10	20	32	5'3	54	...	...	7'1	74	...	...	...	1'5	15
29	0'0	0	142	11	13	14	18	3	0'2	2	...	...	2'3	24	...	...	...	8'6	88
30	1'6	16	361	28	25	12	10	25	1'7	17	...	...	0'1	1	...	...	...	8'0	82
31	0'0	0	204	16	19	II	49	19	0'3	3	...	...	1'5	16	...	...	...	8'4	87
Means	3'23	31	520	32	36	—	—	31	3'94	38	—	—	3'39	33	—	—	—	3'84	37	
Normal	2'26	22	483	29	—	—	—	—	2'97	28	—	—	2'48	24	—	—	—	3'26	31	
			← 35 years →		7 years	← 35 years →		← 35 years →	← 35 years →		← 5 years →		← 35 years →		← 5 years →		← 35 years →		← 35 years →	

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9'1 m. H_b = 13'7 m. H_a = 26'4 m. Above Ground: h_t = 1'3 m. h_r = 0'56 m. h_a = 13'9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0–10) and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.		
			Vapour Pressure.		Percentage.		9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	mm.	a.			Magnetism. Horizontal Force, Declination West, and Inclination.
			9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	mm.	200+	evening.		
1	mb.	mb.	200+	200+	a.	a.	10'8	9'5	80	75	245	7	290	9	1	3	x 19'5 80'5
2	1022'1	1004'7	84'6	83'5	87	83	10'8	14'1	80	96	295	5	—	1	6	10	1'3 79'5
3	1022'1	1021'5	84'5	85'8	80	83	14'9	14'6	97	93	175	5	175	8	7	10	83'4 6'9
4	1023'6	1025'5	87'4	87'2	88	87	15'9	15'9	98	99	175	7	180	4	10	10	86'3 6'3
5	1027'4	1027'5	87'9	87'3	88	x 87	16'3	16'0	97	99	165	5	170	3	10	10	86'9 0'1
6	1027'2	1028'2	87'5	86'8	90	86	16'2	14'9	99	95	—	0	—	0	4	84'3 82'0	
7	1029'4	1030'5	88'0	85'5	x 91	84	14'5	12'5	86	87	90	2	—	0	200	100	82'0 82'0
8	1031'3	1031'0	86'0	86'4	90	81	13'2	13'1	89	86	90	2	55	4	9	2	78'0 78'6
9	1032'7	1033'4	83'4	82'4	86	80	9'1	9'4	73	80	65	4	50	4	1	2	78'6 74'3
10	1030'0	1023'1	82'4	84'4	85	80	8'6	11'9	74	89	25	2	10	2	6	9	80'5 80'5
11	1017'3	1015'4	85'5	85'0	87	84	12'5	11'4	87	82	355	2	360	3	9	9	80'5 80'5
12	1009'8	1009'5	84'7	82'5	86	81	12'3	8'3	90	70	325	6	360	6	8	6	8'2 2'2
13	1009'3	1012'0	81'4	81'7	83	80	7'7	8'4	70	75	340	9	350	5	6	4	3'9 1'5
14	1013'6	1017'7	81'4	81'0	83	79	8'6	7'4	79	69	350	7	5	6	9	1	75'7 9'0
15	1022'2	1027'0	81'8	83'1	84	79	8'0	9'5	71	77	330	6	340	5	7	10	73'6 1'4
16	1030'6	1032'4	84'5	83'9	86	83	12'1	12'4	90	96	315	5	—	1	10	10	78'8 78'8
17	1031'7	1029'4	84'2	84'3	86	83	12'2	10'2	92	77	165	2	130	3	9	7	80'9 80'9
18	1028'3	1027'3	85'2	85'5	87	84	10'4	11'7	74	81	160	7	150	5	8	10	81'4 1'4
19	1025'7	1023'4	86'6	86'7	88	85	14'5</td										

3. METEOROLOGY:—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28'$ N. Long. $0^{\circ} 19'$ W.Heights above Mean Sea Level:—Rain-gauge Site, H = 5.5 m. Barometer, H_b = 10.4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.				Wind—Veer from North in degrees and Speed in metres per second.				Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.	
							Vapour Pressure.		Percentage.		9 h.		21 h.		9 h.					
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.				
1	mb.	mb.	a.	a.	a.	a.	millibar.	%	%	° m/s.	140	4	250	3	1≡ ⁰	10	200+	200+	≡ ⁰ in a. Dull to fine to dull. ● ⁰ at n.	
2	1001.3	999.3	84.3	85.1	x 92	x 81	10 ⁹	12 ⁵	82	89	—	—	—	—	10	71	200+	71	● at times. Fine to dull. Fine at n.	
3	1007.9	1017.8	83.7	81.2	86	79	10 ²	9.3	80	86	260	4	—	—	3	76	200+	76	≡ ⁰ early. Fine. ≡ ⁰ early and at n.	
4	1024.7	1027.5	81.3	78.8	87	75	9.4	8.7	86	95	—	1	—	0	o	70	70	and ≡ early. Fine. ≡ ⁰ all day.		
5	1029.2	1029.2	78.1	81.0	88	73	8.0	10 ²	91	96	—	1	—	0	o	69	74	Dull, with ≡ ⁰ all day.		
6	1029.3	1028.0	83.0	86.3	88	79	11.2	13.7	92	90	—	0	—	1	10≡ ⁰	10≡ ⁰	74	83	≡ early. Dull, then fine to fair.	
7	1028.0	1028.9	86.7	82.7	90	80	14 ⁰	11 ⁰	90	92	70	2	—	1	10≡ ⁰	10≡ ⁰	83	74	● ⁰ d. 7 h. Overcast to 11 h. fine. ∞ in p.	
8	1031.4	1031.6	85.3	83.0	88	80	11 ⁷	8.9	83	73	50	5	80	4	10≡ ⁰	1	74	74	Fine all day. ∞ ⁰ in p.	
9	1029.4	1025.8	81.2	85.5	87	79	8.1	10 ⁸	75	75	30	3	20	3	5	10	—	73	74	Fine to 11 h., then fair to fine. ≡ ⁰ at n.
10	1028.1	1027.9	81.6	79.2	84	79	7.9	7.7	71	82	360	5	360	2	3	4	—	69	69	≡ early. Fair to fine to dull. ≡ ⁰ at n.
11	1022.9	1016.3	78.3	76.5	82	74	6.9	6.7	78	85	350	3	—	1	8≡ ⁰	8≡ ⁰	69	67	● ⁰ p. early. Fine to fair. ≈ at n.	
12	1013.3	1013.3	79.2	75.1	84	74	7.6	7.1	81	99	330	3	—	1	7≡ ⁰	o≡	67	67	early. ● at times. Dull.	
13	1000.6	1002.8	78.6	79.7	83	75	6.9	8.3	76	85	280	4	270	3	6	o ⁶	70	70	early. Line q. 15 h. 30 m. Fine to u.	
14	1037.3	1011.6	79.4	77.0	83	75	8.6	6.9	90	85	260	3	—	1	8≡ ⁰	o	69	69	early. ● ⁰ p. 17 h. 50 m. Cloudy to fine	
15	1016.1	1016.1	75.5	79.1	82	73	6.4	6.7	88	71	280	2	300	5	1≡ ⁰	1	67	67	and ≡ early. ● p. about 12 h. Fine to [dull].	
16	1023.9	1030.6	77.7	75.4	82	73	5.7	6.0	67	82	310	4	—	1	o	o≡	69	69	early. Fine. ≡ ⁰ at n.	
17	1032.6	1033.2	77.9	78.9	86	72	7.4	8.6	85	93	240	2	—	1	4≡ ⁰	o ¹	n 66	66	early. Fine. ≡ ⁰ at n.	
18	1034.7	1035.3	78.9	77.0	86	74	8.6	7.8	93	97	—	0	—	0	10≡ ⁰	o ¹	70	70	and ≡ early. Dull to fine. ≡ ⁰ at n.	
19	1036.1	1034.8	77.6	76.8	88	74	8.2	8.0	97	100	—	0	—	0	10≡ ⁰	o ¹	70	70	to 10 h. 30 m., then fine. ≡ at n. [n].	
20	1033.1	1030.4	79.0	80.0	89	75	9.3	9.4	100	94	—	1	160	2	10≡ ⁰	o ⁰	71	71	≡ to 10 h. 45 m. Fair to fine. ≡ ⁰ at	
21	1029.7	1029.8	80.9	79.0	89	75	9.9	8.6	94	93	—	0	—	1	10≡ ⁰	o ¹	72	72	early. ≡ to 11 h., then fine. ∞ ⁰ in p. ≡ ⁰	
22	1028.4	1024.6	78.0	76.9	87	73	8.7	7.7	100	95	—	0	—	0	10≡ ⁰	o ¹	70	70	early. ≡ to 11 h., then fine. ≡ ⁰ at n. [at n].	
23	1021.8	1017.3	73.7	80.9	87	n 71	5.5	9.5	86	90	—	1	—	1	10≡ ⁰	o ⁰	—	68	early. ≡ to 10 h. 15 m. Fine later. ≡ ⁰	
24	1012.6	1012.2	81.9	82.5	84	79	10 ¹	10 ⁸	89	91	120	2	50	3	10≡ ⁰	x 3.7	73	73	Dull, with ≡ ⁰ or ≡. ● at times. [at n].	
25	1017.0	1022.3	82.9	81.1	84	x 81	9.8	8.9	81	83	30	5	360	6	10	—	79	79	Dull and overcast.	
26	1023.5	1019.8	77.9	79.2	82	76	6.4	6.6	74	76	310	2	300	3	9	o	—	72	72	Fine to overcast to 11 h., then fine. [35 m.]
27	1014.6	1015.2	79.0	79.1	80	76	5.7	7.0	61	74	320	8	340	6	4	10	—	71	71	Fine to overcast. Gusts. ↗ at 9 h. 10 m. and
28	1013.7	1011.8	76.4	76.9	n 79	75	5.9	5.8	76	72	330	5	320	4	4	10	—	73	73	Fine to 14 h. 15 m.—overcast later.
29	1008.8	1004.8	77.3	79.5	81	75	7.1	7.5	85	78	320	5	10	9	8	10	2.6	71	71	Dull. ↗ (gust) 19 h. 50 m. ● in a. and at n.
30	1014.0	1020.2	77.5	77.9	81	77	7.3	6.6	87	76	10	3	30	2	6	?3	1.9	75	75	● at times in a. and at n. Fine to dull.
31	1022.5	1025.9	80.0	78.9	82	76	8.4	7.2	84	78	20	4	20	5	9	5	0.2	74	74	● early and 14 h.-15 h. Dull.
Means	1022.0	1022.1	79.7	79.7	85.0	75.8	8.4	8.5	84	86	2.7	—	2.3	6.4	3.6	14.6	71.5	Monthly Totals or Means.		
Normal	1012.9	1012.9	82.5	82.3	86.4	79.3	10.4	10.5	86	88	3.2	—	2.6	—	69.0	—	—	—	Normals.	

4. METEOROLOGY:—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19'$ N. Long. $3^{\circ} 12'$ W.Heights above Mean Sea Level:—Rain-gauge Site, H = 242 m. Barometer, H_b = 237.3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Vane of Anemometer, h_a = 15 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.				Wind—Veer from North in degrees and Speed in metres per second.				Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.	
							Vapour Pressure.		Percentage.		9 h.		21 h.		9 h.					
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.				
1	970.8	968.8	80.5	82.0	84	76	8.3	10.5	81	92	160	4	240	5	8≡ ⁰ ⊕	9 \bowtie	4.7	72.8	73.8	early; ≡ ⁰ 7 h; ⊕ ⁰ 12 h; \bowtie n.
2	977.1	987.9	82.1	79.0	85	77	8.7	7.9	75	85	290	9	180	3	2	2 \bowtie	—	72.8	c bc, b a; eq, b p; \bowtie 21 h.	
3	995.8	997.5	79.2	83.3	84	76	8.2	11.5	87	92	—	1	—	1	10≡ ⁰	10	—	72.0	● ⁰ all day.	
4	998.6	1000.1	83.9	84.5	86	84	12.3	13.1	95	97	190	8	170	2	10≡ ⁰	10 \bowtie	82.3	≡ ⁰ with occasional ● ⁰ d ⁰ a p n.		
5	1001.3	998.9	84.2	84.5	87	x 82	12.8	13.0	97	96	200	3	200	3	10≡ ⁰	10 \bowtie	83.5	≡ ⁰ d ⁰ a and p. oq, bc n.		
6	998.3	1005.7	84.7	81.6	88	76	13.6	9.3	100	84	190	5	20	3	10≡ ⁰	10	84.0	bc — c \bowtie a; \bowtie 17 h; o, b \bowtie n.		
7	1007.8	1004.6	80.6	81.4	86	80	8.1	9.4	78	86	—	1	—	0	5	9 \bowtie	—	72.8	bc — c \bowtie a; c \bowtie p; o, bq \bowtie n.	
8	1001.2	1002.9	85.0	78.4	x 91	77	11.5	7.0	83	78	—	1	350	2	7	o ⁰	—	74.1	b, bc, \bowtie a; c \bowtie p; o, bq \bowtie n.	
9	1005.0																			

5. GEOPHYSICS :—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.								Magnetic Character of Day.	Electric Character of Day.	Charge per cc. $\times 10^{20}$. + . - .	Air-Earth Current. $\times 10^{16}$.	Potential Gradient, Volts per metre. Factor 2.18.					
					Horizontal Comp't.		Declination.		Inclination.													
	0.3 m.	1.2 m.	Daily Mean.	Extremes.	Mean Time.		Mean Time.	West.	Mean Time.	North.	2	I	2	O	2	I	3 h.	9 h.	15 h.	21 h.		
1	200+	200+	86.2	208	h m	γ	h m	°	h m	°	2		2	o 39	o 08	o 80	v/m.	v/m.	v/m.	v/m.		
2	83.4	86.1	86.1	206	...	...	11 14	18 331	14 18	14 43.5	2	I	2	o 06	...	...	160	320	105	200
3	83.2	85.9	203	...	...	...	...	...	...	...	2	O	2	o 62	o 21	1.00	145	390	200	240
4	82.9	85.9	202	...	...	...	...	...	...	...	2	O	2	o 30	...	...	215	430	335	160
5	82.9	85.7	200	...	...	...	...	...	...	...	2	I	2	o 18	o 18	o 85	190	295	350	255
6	84.1	85.6	198	...	...	...	...	...	...	...	2	O	2	o 18	o 18	o 85	215	270	230	200
7	84.0	85.4	197	...	...	...	...	...	...	...	1	O	1	o 43	o 21	1.30	320	215	455	415
8	83.7	85.4	196	...	...	...	...	...	...	...	1	O	1	o 68	o 04	1.60	230	310	360	390
9	83.9	85.3	195	11 10	18 353	14 20	14 46.7	14 25	2	O	2	o 74	o 51	1.35	105	280	310	280	
10	82.4	85.1	196	...	...	...	...	...	...	...	1	O	1	o 12	o 04	o 65	215	320	190	280
11	81.5	85.0	197	...	...	...	...	...	...	...	1	I	1	o 18	o 12	...	310	360	320	335
12	80.8	85.0	200	...	...	...	...	...	...	...	0	I	0	o 30	o 18	o 85	270	320	145	295
13	81.0	84.8	205	...	...	...	...	...	...	...	0	I	0	o 33	o 55	o 35	160	280	135	160
14	80.4	84.6	208	...	...	...	...	...	...	...	0	O	0	o 64	o 27	o 50	200	335	190	525
15	79.7	84.6	209	209	...	...	...	...	...	...	1	O	1	o 18	o 29	o 55	335	415	200	175
16	79.5	84.4	208	11 10	18 384	14 14	14 47.2	14 31	66 59.1	2	O	2	o 35	o 85	215	270	175	240	
17	79.0	84.2	207	...	...	...	...	...	...	...	1	O	1	o 29	o 25	o 40	230	525	175	335
18	79.4	83.9	205	...	...	...	...	...	...	...	1	I	1	o 30	o 30	...	550	350	200	200
19	79.7	83.9	203	...	...	...	...	...	...	...	0	O	0	o 37	o 18	1.00	605	710	240	175
20	80.0	83.6	201	...	...	...	...	...	...	...	0	O	0	o 29	o 16	1.10	320	320	255	415
21	80.4	83.5	199	...	...	...	...	...	...	...	0	I	0	o 51	o 06	1.05	295	815	230	280
22	80.0	83.4	197	...	...	...	...	...	...	...	1	I	1	o 37	o 18	o 55	145	230	135	240
23	79.6	83.4	196	11 18	18 365	14 26	14 42.4	14 35	66 59.6	1	O	1	o 23	o 21	1.05	360	615	390	320
24	80.2	83.2	195	...	...	...	...	...	...	...	0	I	0	o 30	o 27	...	230	390	55	280
25	80.8	83.2	194	...	...	...	...	...	...	...	0	O	0	o 30	o 27	...	295	430	135	190
26	80.8	83.2	197	...	...	...	...	...	...	...	1	O	1	o 30	o 27	...	120	480	190	320
27	79.9	82.9	201	...	...	...	...	...	...	...	1	I	1	o 37	o 18	o 55	145	230	135	240
28	79.4	82.9	204	...	...	...	...	...	...	...	2	O	2	o 33	o 04	o 70	160	230	215	360
29	79.0	82.9	205	11 8	18 382	14 17	14 41.5	14 31	66 58.1	1	I	2	o 35	o 27	o 75	255	160	400	335
30	79.1	82.9	205	...	...	...	...	...	...	...	1	I	1	o 35	o 27	o 75	z±	645	590	495
31	79.0	82.9	204	...	...	...	...	...	...	...	1	I	1	o 33	o 37	o 75	55	590	440	525
M.	81.1	84.4	201	...	...	...	...	...	...	...	...	...	...	...	...	...	254*	372*	240*	291*
	84.0	85.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
	← 12 years →																					

* Mean for 29 days only.

6. GEOPHYSICS :—ESKDALEMUIR.

Day.	North Component.			West Component.			Vertical Component.			Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 6.06.								
	Maximum. 15000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	Maximum. 44000 γ +.	Minimum. 44000 γ +.	Range.			3 h.	9 h.	15 h.	21 h.					
	h m	γ	h m	h m	γ	h m	h m	γ	h m	h m	v/m.	v/m.	v/m.	v/m.						
1	22 13	1193	<634	22 13	1089	591	23 27	498	§	>1310	941	23 50	>369	2	I b	335	230	—5	440	
2	19 5	992	<634	14 6	891	599	o 15	292	18 45	1126	913	o 27	213	2	O a	305	125	135	225	
3	21 44	1112	815	7 47	297	6 54	922	780	21 38	142	18 0	1106	1021	6 30	85	2	I a	125	60	85
4	19 54	1125	795	21 56	330	21 50	997	759	21 28	238	19 52	1257	1030	24 0	227	2	O a	75	100	245
5	16 54	1336	907	13 42	429	6 52	173	788	6 52	385	to 16 53	>1415	1018	o 6	>397	2	O a	525	410	280
6	20 3	1053	853	2 5	200	2 32	927	783	8 17	144	0 1	1000	3 41	102	2	I a	235	400	155	275
7	19 54	1044	926	14 28	118	13 52	906	834	16 47	72	17 4	1109	1056	o 38	53	1	O a	110	295	560
8	22 16	1048	935	12 0	113	14 19	897	790	24 0	107	21 30	1085	1028	2 37	57	1	I a	330	260	410
9	20 48	1038	921	11 7	117	13 35	927	790	o 2	137	15 28	1140	1038	o 55	102	1	O a	175	140	225
10	22 6	1038	920	10 56	118	14 27	895	835	22 37	60	9 50	1086	1066	23 59	20	1	I a	165	250	200
11	22 46	1016	949	11 54	67	14 41	901	828	9 16	73	16 25	1081	1054	3 25	27	0	I b	95	200	170
12	21 9	1018	957	12 55	61	14 8	912	832	23 33	80	20 50	1078	1062	12 30	16	0	2 b	325	125	260
13	21 6	1027	963	9 45	64	13 50	903	839	9 0	64	19 45	1085	1065	12 27	20	0	2 c	130	225	z±
14	6 6	1012	953	10 57	59	13 38	901	843	9 37	58	8 34	1082	1066	12 10	16	0	I b	—10	325	220
15	5 18	1012	961	14 2	51	12 3	796	20 24	114	20 26	1089	1056	12 5	33	1	O a	205	150	200	405
16	4 4	1024	906	6 19	118	6 29	949	789	1 35	160	20 35	109								

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$
 Heights above M.S.L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1·48 m. h_r = 1·72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.						Min. Temp. on Grass.	Percentage of Humidity.			Rain 0 h. to 24 h.	REMARKS.			Earth Current Character.
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.	Mean of 5 Readings.		9 h.†	14 h.	21 h.	Mean.				
1	mb.	mb.	mb.	mb.	a.	a.	a.	a.	a.	a.	200+	%	%	%	%	mm.	2·6		2
2	995·3	994·9	998·6	996·3	87·2	88·0	86·4	89·5	83·0	86·8	76·0	86	80	72	79	2·0	4 h. ● ² 15 h., 22 h. and n. ● 2 o h., 9 h., 20 h.	2	
3	1019·3	1019·9	1021·5	1020·2	85·0	87·4	82·3	88·0	81·8	84·9	75·6	68	56	77	67	0·3	● 1 h.	2	
4	1022·2	1021·0	1022·2	1021·8	86·8	89·0	84·7	89·4	81·4	86·3	73·6	67	55	84	69	—	4 h.	2	
5	1022·3	1020·3	1020·9	1021·2	87·2	88·2	86·9	89·0	85·0	87·3	78·9	84	76	85	82	—	● ⁰ 13 h.	2	
6	1020·6	1020·6	1020·1	1020·4	87·4	89·6	87·0	x 90·5	x 85·4	88·0	81·2	89	81	96	89	—	≡ ⁰ 17 h.	2	
7	1020·9	1020·2	1021·0	1020·7	87·6	88·9	86·8	89·6	85·3	87·6	85·1	88	72	79	80	—	0		
8	1020·5	1018·7	1018·9	1019·4	85·1	86·6	84·6	87·1	84·0	85·5	81·0	68	65	71	68	—		1	
9	1021·3	1021·3	1021·4	1021·3	84·4	85·0	83·3	86·0	83·4	84·4	75·5	70	53	62	62	—	Gloomy 8 h.	1	
10	1019·0	1015·5	1012·3	1015·6	82·9	83·3	82·8	84·9	81·8	83·1	76·2	52	54	62	56	—	○ ² 4 h.	0	
11	1007·1	1007·6	1007·9	1001·5	83·1	84·8	81·3	86·0	78·6	82·8	73·3	82	61	59	67	2·2	● ² 19 h.	0	
12	1004·7	1002·2	998·5	1001·8	83·6	85·2	84·3	85·7	78·7	83·5	71·0	62	63	97	74	x 5·5		0	
13	998·6	999·8	1002·7	1000·4	82·0	83·0	81·6	84·3	81·0	82·4	77·3	60	73	72	68	2·2	● ² 12 h. and 13 h.	0	
14	1006·6	1007·7	1008·3	1007·5	84·3	84·7	81·3	86·4	81·2	83·6	73·1	60	57	81	66	4·9	● ² 12 h., 15 h. ●▲ 16 h.	0	
15	1011·4	1013·0	1013·3	1013·2	82·2	83·5	82·6	84·1	79·2	82·3	73·8	59	x 48	61	56	3·1	● ² frequent showers. ▲ 10 h. 30 m.	1	
16	1020·9	1023·4	1020·3	1023·5	82·0	83·4	80·2	83·9	79·5	81·8	76·6	54	51	62	56	2·3	● ² 6 h.	1	
17	1028·3	1028·2	1028·5	1028·3	84·2	85·5	80·4	86·6	78·7	83·1	x 70·7	64	59	83	69	—		1	
18	1028·6	1027·8	1028·1	1028·2	84·0	86·2	83·4	86·8	79·9	84·1	72·5	64	64	87	72	—	⊕ 9 h.	1	
19	1028·7	1027·8	1026·7	1027·7	84·4	88·1	84·4	88·9	81·6	85·5	71·0	74	57	81	71	—		1	
20	1025·4	1023·5	1023·7	1024·2	82·8	86·5	86·0	88·5	81·2	85·0	72·2	90	67	73	77	—	A.-Cu. red 6 h.	0	
21	1023·3	1022·2	1021·9	1022·5	84·5	87·7	84·5	88·1	83·8	85·7	78·2	79	65	81	75	—	Fine.	0	
22	1022·2	1018·7	1018·2	1019·7	84·5	87·0	82·0	87·4	81·4	84·5	72·5	69	57	87	71	—		0	
23	1016·2	1013·9	1012·3	1014·1	83·8	85·7	84·5	86·8	81·0	84·3	71·4	71	55	68	65	—	● ² 6 h.-14 h.	0	
24	1005·0	1003·0	1002·6	1003·5	83·7	84·9	83·9	85·6	83·1	84·2	80·0	93	88	91	91	4·2	● about 4 h. and evening.	0	
25	1007·3	1009·8	1014·6	1010·6	83·3	85·4	83·6	85·5	81·9	83·9	78·9	82	70	83	78	0·5		[30 m.]	
26	1018·9	1018·3	1017·5	1018·2	81·7	82·5	81·9	83·6	81·7	82·1	79·4	74	61	61	65	—	■ 4 h. ● ² ▲ 8 h. 50 m. ● ² 16 h. ▲ 16 h.	1	
27	1014·1	1012·2	1012·3	1012·9	81·9	82·8	81·6	83·8	80·3	82·1	75·5	56	49	55	53	1·0	Rainy day.	0	
28	1010·7	1009·0	1008·6	1009·4	79·0	81·1	76·6	82·4	x 75·7	79·0	74·8	73	x 48	85	69	3·2			
29	1007·1	1005·0	1001·7	1004·6	80·5	80·3	81·9	x 82·0	77·0	80·2	73·0	63	69	80	71	3·9			
30	1005·0	1007·8	1011·9	1008·2	80·9	80·7	78·6	82·4	77·8	80·1	76·8	72	72	82	75	1·5			
31	1014·2	1015·4	1017·8	1015·8	81·3	80·9	79·8	x 82·0	77·2	80·2	71·0	83	82	86	84	2·4			
Means	1015·3	1014·9	1015·4	1015·2	83·8	85·3	83·0	86·2	81·2	83·9	75·7	72	64	77	71	41·8		0·7	
Normal	1008·6	1007·9	1008·5	1008·3	85·2	86·5	85·0	87·7	83·1	85·5	79·5	?	73	80	?	91·9			
	← 26 years	→ 26 years	← 26 years	→ 26 years	← 26 years	→ 26 years	← 26 years	→ 26 years	← 26 years	→ 26 years	← 26 years	?	73	80	?	91·9			

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).				Mean of Force	Sunshine.*	Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.												Mean Amount.
	Upper.			Lower.			Upper.			Lower.			Upper.			Lower.			
	Total.	Tenths.	Per cent. of Possible.	Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.	Mean Amount.	
9 h.†	14 h.	21 h.	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	14 h.	14 h.	14 h.	14 h.	14 h.	21 h.	21 h.	21 h.	21 h.	21 h.	W NW 7·0 6·7	
1	203 2	203 3	247 3	2·7	0·8	7 6	Ci.-Cu.	SW	...	NW	10 6	A.-Cu.	SW	...	5 6	...	...	Cu.-Nb. NW
2	293 4	293 5	337 3	4·0	9·7	83 8	A.-Cu.	...	Cu.-Nb., Nb.	NNW	3 2	...	...	Cu.	N	0 7	...	...
3	360 2	360 3	45 2	2·7	7·7	67 5	Ci.	...	Cu.	NNW	3 2	...	...	Cu.	NE	7 9	...	...
4	23 3	45 3	45 2	2·7	9·3	81 0	...	...	...	...	...	Cu.-Nb.	ENE	10 3	A.-Cu.	ENE	9 7	...
5	23 3	45 2	67 3	2·7	1·3	11 10	...	...	Cu.-Nb.	ENE	3 3	Ci.	S	...	10 10	...	...	...
6	67 3	67 4	67 4	3·7	4·8	43 8	...	...	Cu.-Nb.	ENE	4 4	...	...	Cu.	ENE	9 7	...	...
7	67 5	67 6	67 5	5·3	3·9	35 9	...	...	Cu.-Nb.	ENE	3 3	Ci.	ENE	...	...	...	...	...
8	67 5	45 5	45 4	4·7	7·4	66 7	...	...	Cu.-Nb.	ENE	3 7	...	...	Cu.-Nb.	NE	6 7	...	...
9	45 4	23 5	23 3	4·0	4·9	39 10	...	...	Cu.-Nb.	NE	8 8	...	...	Cu.-Nb., Nb.	NNW	8 8	...	...
10	23 3	315 3	23 2	2·7	3·8	34 7	...	...	Cu.-Nb.	NNE	4 4	A.-Cu.	NNW	Cu.-Nb., Nb.	...	...	...	...
11	45 4	23 4	45 1	3·0	8·5	77 6	A.-Cu.	N	Cu.-Nb.	NNE	4 4	...	...	Cu.-Nb.	...	...	...	...
12	225 4	247 4	247 4	4·0	0·3	2 2	...	...	Cu.-Nb.	N	10 10	...	...	Cu.-Nb.	W	6 10	...	...
13	315 4	315 4	203 4	4·0	8·2	76 6	Ci.	W	Cu.-Nb.	NW	5 5	...	...	Cu.-Nb.	W	8 8	...	...
14	247 4	270 3	315 1	2·7	4·0	37 4	...	...	Cu.-Nb.	W	7 7	A.-Cu.	W	Cu.-Nb.	W	6 6	...	...
15	315 3	315 3	315 4	3·3	4·8	45 8	A.-Cu.	WNW	Cu.-Nb., Nb.	NNW	4 4	...	...	Cu.-Nb.	N	6 6	...	...
16	337 4	360 3	337 1	2·7	9·0	84 4	...	...	Cu.	N	4 4	...	...	Cu.-Nb.	W	3 3	...	...
17	203 2	225 3	247 1	2·0	8·1	76 3	...	...	Fr.-Cu.	SW	6 6	...	...	Cu.	W	0 0	...	...
18	180 2	90 2	90 2	2·0	9·8														

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 8'8 m., Ground 13'7 m., M.S.L. 19'2 m.
Height of Cups above—Roof 4'6 m., Ground 7'6 m., M.S.L. 15'2 m.

Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.		
	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.										
1	6'8	1'3	9'0	1'8	3'1	...	4'7	...	1'9	9'6	...	15'3	10 50	I
2	7'5	11'1	6'2	9'2	3'8	5'7	...	5'3	5'3	...	17'3	3 0	2	
3	2'3	2'3	...	1'5	...	3'6	...	5'0	...	3'3	...	5'2	...	2'1	...	8'9	22 15	3
4	5'7	2'4	...	6'2	...	2'6	...	6'1	...	1'2	...	2'9	...	0'6	...	10'7	8 20	4
5	3'2	0'6	...	4'2	...	0'8	...	3'6	...	1'5	...	1'9	...	1'3	...	10'4	10 15	5
6	2'5	1'7	...	4'7	...	3'1	...	2'5	...	1'7	...	Calm	...	12'0	23 25	6		
7	1'7	...	8'7	1'3	...	6'5	1'9	...	1'3	Calm	...	14'8	1 0	7	
8	...	Calm	...	...	3'6	...	...	7'2	...	...	9'4	...	3'9	15'4	19 0	8
9	1'4	...	7'1	...	2'5	...	6'1	...	5'7	...	3'8	...	5'5	...	1'1	12'0	3 15	9
10	4'9	...	3'3	...	5'5	...	1'1	...	5'1	...	5'1	...	4'5	...	1'9	13'8	16 45	10
II	6'1	...	2'5	...	1'0	...	2'4	...	1'4	...	1'4	...	Calm	...	10'1	5 30	11	
12	2'0	...	4'8	...	4'0	6'0	...	10'4	7'0	...	1'1	5	7'7	...	19'7	19 35	12	
13	11'5	7'7	...	10'5	10'5	...	11'1	7'5	...	5'5	1'1	...	21'0	12 40	13			
14	10'4	7'0	...	8'1	8'1	...	7'6	5'1	...	9'7	4'0	...	15'8	4 25	14			
15	8'8	3'6	...	9'0	9'0	...	9'4	3'9	...	12'1	5'0	...	19'0	16 35	15			
16	10'3	2'0	...	6'9	...	2'9	...	6'9	2'9	...	2'1	2'1	...	18'3	3 45	16		
17	1'2	5'8	...	0'9	4'5	...	0'9	...	4'5	1'7	...	10'5	4 0	17				
18	2'6	...	3'8	...	2'9	...	4'3	...	2'9	...	2'5	...	1'7	10'0	12 10	18		
19	4'3	...	1'8	5'8	...	1'2	6'5	...	1'3	5'5	...	2'3	...	12'1	12 10	19		
20	6'1	...	1'2	7'4	...	1'5	6'1	...	2'5	...	4'5	...	1'9	13'7	10 40	20		
21	3'0	...	1'3	2'0	...	0'4	...	2'5	...	1'7	3'8	...	0'8	...	7'1	4 50	21	
22	4'8	...	1'0	6'8	...	1'3	5'7	...	2'4	...	5'7	...	2'4	...	12'3	10 35	22	
23	6'9	...	2'9	7'4	...	1'5	4'8	...	1'0	3'2	...	0'6	...	13'7	1 10	23		
24	5'5	13'3	...	5'5	13'3	...	7'3	10'9	...	7'5	...	11'1	20'5	9 50	24			
25	5'8	8'7	...	4'9	7'4	...	8'7	5'8	...	6'4	...	2'6	15'4	11 50	25			
26	9'0	1'8	...	10'3	...	2'0	...	11'6	2'3	...	13'7	5'7	...	21'1	18 20	26		
27	13'1	2'6	...	13'1	...	2'6	...	11'1	...	9'4	...	3'9	20'5	1 45	27			
28	10'0	4'1	...	8'5	5'7	...	10'0	4'1	...	10'0	4'1	...	17'0	22 20	28			
29	10'1	6'7	...	11'8	4'9	...	11'7	7'8	...	9'8	9'8	...	19'8	17 30	29			
30	9'0	9'0	...	4'3	10'3	...	4'3	...	4'9	...	6'6	17'5	3 35	30				
31	1'2	...	6'1	1'8	...	9'0	5'7	...	8'5	2'4	...	5'7	14'4	?	31			
+N & E	177'7	136'2	177'6	143'6	187'7	116'7	163'6	107'4										
-N & E	-78'5	-5'4	-59'2	-8'4	-81'7	22'3	-89'8	6'0										

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1'6 m., Ground 4'9 m., M.S.L. 57'3 m.

Day.	3 h.				9 h.				15 h.				21 h.				Vel. in Max. Hourly Run.	Time of Max.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.		
	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	hrs.
1	9'3	1'9	1'9	...	1'9	1'9	...	2'2	1'0	...	7'3	7'6	...	5'1	14'1	12
2	6'4	...	2'6	...	1'8	9'0	3'3	7'9	...	1'2	5'8	11'1	7
3	0'9	4'5	...	4'5	...	1'9	...	7'4	...	...	1'5	9'5	...	...	...	9'5	21, 23
4	6'9	...	1'6	...	1'6	...	...	...	...	2'0	...	3'0	...	6'9	...	1'3	6'6
5	3'3	...	3'3	...	3'9	...	3'9	...	1'9	...	4'5	...	4'9	...	4'9	6'6	8, 24	
6	4'9	...	4'9	...	4'9	...	4'9	...	5'3	...	5'3	...	5'3	...	5'3	10'8	4	
7	4'9	...	4'9	...	4'9	...	4'9	...	4'9	...	4'9	...	4'9	...	4'9	11'1	24	
8	...	Calm	...	...	2'8	...	...	1'1	...	3'6	...	3'1	...	4'7	...	12'5	2
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10'5	16
10	...	No re cor d	...	No re cor d	10'2	3, 15, 20
II	...	5'8	2'4	...	5'7	...	1'1	...	4'2	...	3'2	...	3'2	...	5'9	...	7'9	24
12	...	1'7	...	...	2'3	3'5	...	4'9	7'3	...	8'1	1'6	...	13'5	12 45	12	
13	...	8'1	1'6	...	10'0	4'1	...	7'6	7'6	...	7'1	7'1	...	18'5	17 20	13		
14	...	5'6	5'6	...	3'9	5'9	...	3'5	5'2	...	6'6	4'4	...	16'0	21 5	14		
15	...	6'6	2'7	...	7'7	3'2	...	8'3	5'6	...	8'6	5'8	...	15'0	21 10	15		
16	...	9'0	1'8	...	6'7	...	4'6	...	0'7	...	0'3	14'0	3 0	16				
17	...	0'3	0'2	No re cor d	3'9	...	1'6	3'9	...	1'6	5'1	23 50	17					
18	4'1	...	4'1	6'2	...	2'6	6'2	...	4'2	5'0	...	5'0	8'0	8 10	18			
19	4'6	...	1'9	6'2	...	2'6	7'3	...	4'9	5'0	...	5'0	10'0	16 10	19			
20	6'9	...	4'6	4'8	...	3'2	3'7	...	0'7	3'7	...	0'7	10'4	3 0	20			
21	3'7	...	0'7	3'3	...	3'3	3'9	...	1'6	5'6	...	3'7	7'8	23 25	21			
22	6'6	...	1'3	5'4	...	2'2	5'6	...	3'7	4'3	...	1'8	8'5	13 5	22			
23	o'8	4'1	...	3'2	2'1	...	5'8	...	1'0	2'3	...	8'5	22 45	23				
24	6'2	6'2	...	6'5	6'5	...	15'4	...	14'7	2'9	...	2'9	27'0	12 40	24			
25	No re cor d	No re cor d	...	9'2	3'8	...	9'2	3'8	17'1	0	25	...	4'2	0'8	5'1	3'6	12'5	
26	7'7	5'1	...	8'1	1'6	...	8'3	...	6'3	...	12'0	13 0	26					
27	7'1	...	1'1	10'6	2'1	...	9'6	...	6'7	...	15'5	10 15	27					
28	7'4	1'5	...	6'6	1'3	...	7'0	1'4	...	4'8	3'2	15'5	18 50	28				
29	6'7	...	...	7'5	...	...	9'0	1'8	...	12'3	2'4	...	22'5	29			
30	10'2	2'0	...	5'0	...	2'8	...	4'2	1'5	7'4	1'0	16'0	30					
31	o'8	4'1	No re cor d	5'3	5'3	...	o'9	4'5	10'0	14 35	31							
S+N & W+E	61'4	73'5	...	85'0	84'8	...	87'7	81'0	...	6'1	4'1	...	69'4	71'0				
S-N & W-E	-47'0	39'1	...	-60'6	35'2	...	-69'3	13'8	...	-4'0	1'6	...	-36'6	57'2				

ENGLAND E.:—SHOEBURYNESS.*

Height of Head above—Ground 27'4 m., M.S.L. 31'4 m.

Day.</

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.											MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.							
Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ.	Remarks.	o h.		6 h.		12 h.		18 h.			
				A _{N.}	A _{E.}	A _{Z.}			A _{N.}	T.	A _{N.}	T.	A _{N.}	T.	A _{N.}	T.		
3	e e S L M F	h m s	s	μ	μ	μ	km.		1	1'8	5'5	2'5	5'5	3'6	5	1'7	5'5	
		10 1 37	...	...	...	...			2	1'1	5'5	1'1	4'5	1'2	4	1'0	5'5
		10 8 27	...	...	...	...			3	1'0	5	0'9	5	0'5	5	1'1	4'5
		10 18 27	...	...	...	...			4	0'9	6	1'3	5'5	1'1	6	1'6	6
		10 36	...	...	...	...			5	1'5	6'5	1'6	5'5	0'9	6	0'9	5
		10 50	26	7	...	...			6	0'7	5'5	0'5	4	0'5	4	0'3	4
		12 15	...	...	...	...			7	0'8	4	0'8	4	0'9	4	0'7	4
									8	0'2	4	...	...	0'3	4	0'4	5
									9	1'1	4	1'0	4'5	...	...	...	...
									10	...	...	...	...	1'1	4	1'0	4
	L F	18 32	...	...	...	...			11	0'8	4'5	0'4	4'5	0'3	4	0'3	4
		19	...	...	...	...			12	0'1	4	0'3	4'5	0'5	4	0'7	5
									13	1'0	6	1'0	5'5	0'9	5'5	0'9	5'5	
									14	1'4	4	0'7	5	0'7	5	0'5	5	
									15	0'7	5	0'6	4	0'5	4	0'9	4'5	
		7	...	...	...	...			16	1'0	4	0'6	5'5	0'8	4	0'5	5
8	P S L F	5 14 38	...	...	...	...	5800	Slight disturbance.	17	0'7	4	0'6	4	0'6	4'5	0'7	4'5
		5 21 51	...	...	...	...			18	0'7	5'5	0'4	4'5	0'7	5'5	1'1	4
		5 30 28	...	...	...	...			19	0'9	5	1'0	5'5	0'7	6	0'7	5'5
		7	...	...	...	...			20	0'7	5'5	0'8	4	0'8	4	0'5	5'5
									21	0'9	6	1'0	4'5	0'8	5'5	0'8	6	
									22	1'0	4	0'9	5'5	1'1	4	0'9	4	
									23	1'1	4	0'9	4'5	0'9	4'5	0'7	5	
									24	0'7	5	0'5	4	0'5	3'5	0'6	4	
									25	0'6	4	0'2	4	0'3	4	0'3	5'5	
									26	0'7	5	0'9	5'5	1'4	5'5	1'1	6	
11	P L F	13 39 34	...	...	...	...	Moderate disturbance; phases obscured by wind effects.		27	1'4	5'5	1'4	4	1'6	5'5	1'8	5
		13 49	...	...	...	...			28	1'4	5	1'7	5'5	1'6	5	1'3	4'5
		14 40	...	...	...	...			29	1'6	5	1'3	4'5	1'1	5	1'2	4
									30	1'4	4	0'8	5'5	0'9	4'5	0'9	4	
									31	0'9	4	0'4	6	0'6	5'5	0'7	7	
		22 8 to	...	...	...	...								
		23 30	...	...	...	...								
21	L F	22 26	...	...	...	...	P and S doubtful.										
		23 30	...	...	...	...								
25	P S L F	6 10 1	...	...	...	...	3170	Slight disturbance.									
		6 13 39	...	...	...	...								
		6 15 14	...	...	...	...								
		7	...	...	...	...								
31	O P S L F	17 15 50	...	...	...	...	6700										
		17 20 45	...	...	...	...								
		17 23 49	...	...	...	...								
		18 30	...	...	...	...								
31	L M _N M _E F	19 44 30	...	18	...	...		Small. Succession of small waves to 17 h. 13 mi.									
		19 51	23	23	...	...										
		19 51	22	23	...	...										
		20 30	...	...	...	...								

Note.—Time marking arrangements failed during passage of disturbance beginning soon after 1 h. on 10th October 1919.

10. SOUNDINGS WITH PILOT BALLOONS.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.														Cloud Observations.									
		Geostrophic.		By Anemometer.		At Heights above M.S.L.										Time, G.M.T. h. m.		Type.		Deg. from N.		Type.		Deg. from N.	
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.											
ABERDEEN.																									
3 25	17 0 17 0	230 315	17 6 265	200 295	4 5 2 0	225 320	17 0 12 0	235 315	10 0 11 5	235 11 5	12 0 11 5	...	...	...	...	13 0 13 0	Fr-Cu. ...	...	330 10 0	...	Ci-Cu. ...	305 2 5	...
3 7 7 8 8 11 13 14 15 16 21 25 28 28	7 10 25 11 45 7 20 11 45 7 30 17 5 7 30 11 40 11 40 11 40 12 0 12 0 7 30 11 50	300 ?	7	calm	360 150 135	1 0 0 5 2 1	235 100 275	4 7 4 4 3 0	310 180 200	10 0 1 0 4 3	335 130 185	12 5 3 8 5 0	...	...	...	...	St. ...	...	...	Ci-St. Ci.	...	...	...
7 11 13 14 15 16 21 25 28 28	7 25 20 15 14 11 40 11 40 11 40 12 0 12 0 10 10	360 5 310 14 350 210	7 5 6 0 8 8	350 5 8 6 0 335 1 7	6 0 1 1 0 1 1 0 335 5 0	350 15 350 345	6 5 11 5 17 0 5 0	5 25 350 345	13 0 11 5 17 0 10 0	350 10 0 340 345	7 5 10 5 11 5 8 0	...	...	...	...	St-Cu. Cu. St-Cu. Cu., Fr-Cu. A-Cu. Cu. Fr-Cu. Cu., Fr-Cu.	...	...	...	A-Cu. Ci-St. Ci-St. Ci-St. ...	345 20 360 ...	7 5 ...	
21	15 10	220	8	170	2 0	190	3 2	165	7 0	185	11 0	210	16 0	205	2 2	A-Cu. Cu. Fr-Cu. Cu., Fr-Cu.	...	...	...	...	...	...	...
25	12 0	360	5	30	6 0	25	6 5	25	10 0	10	8 5	20	9 5	...	...	...	...	...	...	...	...	...	...
28	7 30	360	12	360	9 5	360	17 0	5	25 0	5	9 0	...	...	...	...	...	...	...	...	...	...	...	...
28	11 50	10	21	360	11 0	355	10 5	10	22 5	25	17 5	...	...	...	...	...	...	...	...	...	...	...	...
						5000 m.	6000 m.	7000 m.	8000 m.	9000 m.	10,000 m.														
7 7 11 11 21 21	7 25 11 45 7 20 11 40 15 10	(For observations at lower levels, see above.)	305 320 15 270 205	5 0 5 5 27 0 3 7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	11 40																								
SOUTH FARNBOROUGH.																									
3 4 8 8 9 10 10 10 13 14	7 15 7 45 9 40 12 25 7 0 7 15 7 40 15 30 7 15 7 20	10 ?	7 ?	305 calm	1 5	10 310	10 0 5 0	360 80	8 5 4 0	340 60	7 0 7 5	20 45	9 5 7 5	5 65	22 0 13 5	...	A-St. ...	...	...	...	...	...	...
4 13	7 45 7 15																								
		(For observations at lower levels, see above.)																							

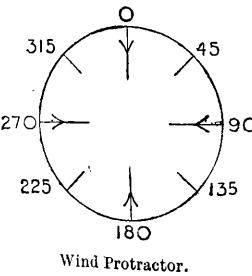
Notes on Pressure Distribution.

October 1919.

- 1st, 7 h. Low centered off NW. of Ireland.
 3rd, 7 h., 18 h. Deep depression centered near Iceland. SW.-NE. ridge across the British Isles.
 7th, 7 h., 13 h. Anticyclone centered over the British Isles.
 8th, 7 h. Anticyclone over the British Isles, centered over Iceland; V over Scandinavia.
 8th, 13 h., 18 h. Anticyclone centered S. of Iceland, Low over the Baltic.
 9th, 7 h.-11th, 7 h. Deep depression centered over the North Sea.
 14th, 7 h., 18 h. Anticyclone from the Azores to Spitzbergen.
 15th, 7 h. " " " the Gulf of Bothnia.
 16th, 7 h., 13 h., 18 h. Anticyclone over the British Isles, centered S. of Ireland.
 17th, 7 h., 13 h., 18 h. " " " over France.
 18th, 13 h.-22nd, 13 h. " " " Central Europe.
 23rd, 7 h., 13 h. Shallow trough extending from Ireland to Scandinavia, SW.-NE. ridge over England.
 25th, 13 h., 18 h. Anticyclone centered near Iceland.
 27th, 7 h. " " " shallow Low centered over the North Sea.
 27th, 18 h. Extensive shallow Low over Central Europe;
 28th, 7 h., 13 h., 18 h. Low centered over Holland; Anticyclone from the Azores to Spitzbergen.
 29th, 7 h., 13 h. Low centered over the Channel;
 30th, 7 h., 13 h. France;
 31st, 7 h., 13 h. Well established anticyclone centered over the Färöe.

Height of Station above M.S.L.=H., Anemometer above ground=h.

Aberdeen	II. h.
Eskdalemuir	14 m. 32 m.
S. Farnborough (Golf Course)	242 m. 15 m.
Cahirciveen	70 m. 31 m.
	9 m. 13 m.



Aberdeen—
 3rd, 17 h. Ci-Cu. rapidly degraded and became fused into A-St. sheet during afternoon.
 25th, 17 h. Sky became rapidly cloudy with St-Cu. after 16 h.

Eskdalemuir—
 3rd, 7 h. 10 m. Sky became overcast with low clouds at 7 h. 30 m.
 7th, 7 h. 25 m. Ci. and Ci-St. degrading to A-Cu. very rapidly.
 8th, 7 h. 20 m. Rapid change of cloud form during ascent.
 15th, 7 h. 30 m. Brilliant parhelia during ascent.

South Farnborough—
 3rd, 7 h. 15 m. Surface mist.
 4th, 7 h. 45 m. "
 15th, 7 h. 15 m. "

Cahirciveen—
 7th, 9 h. 50 m. At about 4 km. a brief and vigorous downdraught of about 80 to 100 metres per minute was encountered, followed by a steady upward current of about 55 m/m. which continued over a vertical distance of about 1000 m. (Two-theodolite method.)
 13th, 7 h. 55 m. High velocities obtained above 3000 m. seem to indicate a leak in balloon.
 29th, 11 h. 20 m. At 3 km. an upward current of about 45 m/m. persisted over about 500 m. Traces of briefer vertical currents appeared at about 5.5 km. (Two-theodolite method.)
 30th, 11 h. 35 m. At 4.5 km. an upward current of about 40 m/m. prevailed over about 1000 m. Traces of briefer vertical currents at 6 km. (Two-theodolite method.)
 31st, 14 h. 50 m. At 2 km. a vigorous upward current of 80 m/m. continued over about 400 m., preceded by a brief downdraught of about 65 m/m. At 3 km. a downdraught of about 65 m/m. was found over about 100 m. Throughout the whole ascent up to 3.5 km. there was a great deal of convection. (Two-theodolite method.)

10. SOUNDINGS WITH PILOT BALLOONS—*continued.*

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.												Cloud Observations.									
		Geostrophic.		By Anemometer.		At Heights above M.S.L.								Time, G.M.T. h. m.		Type.		Deg. from N.		Type.		Deg. from N.	
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.									
		h. m.		Deg. from N.		Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.								
SOUTH FARNBOROUGH— <i>continued.</i>																							
15	7 15	315	8	305	3°0	335	11°0	335	12°0	335	13°0	...	...	...	...	...	...	...	...	Ci.	
15	8 25	315	8	315	3°6	335	10°0	330	11°5	330	11°0	335	15°0	...	...	...	...	...	...	Ci.	
16	7 15	35°	15	? 4°5	35°	15°5	345	17°0	355	19°0	355	23°5	...	...	...	A-St.	...	...	...	...
17	7 20	29°	8	calm	285	9°0	305	8°5	320	12°5	330	10°5	...	...	...	A-Cu.	...	...	...	...
17	12 20	27°	8	245	5°5	270	7°0	310	8°0	315	9°0	315	12°0	...	...	...	Cu., Fr-Cu.	...	...	...	...
20	12 5	?	?	180	3°6	180	8°5	200	11°5	210	6°0	195	5°5	185	3°5	...	...	...	...	Ci.	
21	7 40	19°	7	calm	150	5°5	160	3°5	225	2°9	225	3°1	200	2°7	...	A-Cu., A-St.	...	...	...	...
21	15 0	16°	7	180	1°3	145	5°0	130	5°5	110	5°5	110	1°0	140	6°5	...	...	...	...	Ci-Cu., Ci-St.	
22	11 40	?	?	180	6°5	155	4°9	170	9°5	...	...	60	2°5	95	1°7	...	Fr-Cu.	...	...	...	...
23	8 20	?	?	calm	185	7°0	185	3°7	185	2°3	285	2°0	195	1°6	...	...	...	...	...	Ci.	
23	12 0	?	?	225	2°7	185	5°5	220	5°5	245	3°7	225	2°1	215	2°6	...	A-Cu., A-St.	...	...	...	...
27	8 0	35°	18	335	9°5	315	8°0	345	22°0	335	12°5	...	...	...	...	...	A-St.	...	...	...	...
28	7 20	35°	13	335	4°0	345	17°5	350	16°5	345	14°5	350	17°0	...	...	...	A-St.	...	...	...	...
CAHIRCIVEEN.																							
1	7 35	240	8	250	5°5	270	12°0	270	14°5	260	14°0	245	11°0	...	...	...	Cu.	270	...	...	...
3	7 20	230	11	180	6°0	215	12°0	220	12°0	230	13°5	235	10°0	270	6°5	...	{ St.	225	...	Ci-Cu.	300 2°0		
7	7 20	160	8	100	4°7	100	5°0	95	10°0	120	4°6	...	...	...	...	...	A-Cu.	320	2°5	...	...
7	9 50	160	8	75	4°5	95	11°0	90	9°5	95	6°0	115	9°5	105	9°0	...	Fr-Cu.	110	...	Ci.	...		
8	16 25	40	11	10	6°0	30	6°0	45	12°0	55	18°0	40	10°0	...	...	...	Cu.	...	...	...	...
9	7 30	80	12	75	9°5	55	10°0	25	10°5	30	16°5	20	16°0	20	19°5	...	Cu.	20	...	...	...
9	16 5	40	8	50	6°5	60	7°0	30	1°3	20	11°0	15	16°5	10	16°5	...	Cu.	30	5°5	...	...
13	7 55	?	?	10	7°5	345	12°0	340	12°0	340	16°5	335	19°0	...	...	...	Cu., St-Cu.	340	...	...	...
14	8 15	325	10	345	6°0	330	9°0	330	10°0	305	13°0	...	...	...	...	...	St.	340	...	A-St.	315
15	8 15	320	10	5	1°0	335	8°0	335	14°0	340	10°5	...	...	...	...	...	Cu., Fr-Cu.	340	...	A-Cu.	315
16	12 35	?	?	335	2°0	315	6°0	315	8°0	330	8°0	350	8°0	330	12°0	...	Cu., St-Cu.	315	...	...	...
17	0	?	?	185	2°5	170	5°0	200	7°5	185	9°0	200	10°5	220	7°5	...	Cu., St-Cu.	225	...	A-Cu., A-St.	225		
18	12 10	210	8	175	5°5	165	9°0	190	4°9	190	17°0	205	16°5	...	...	...	Cu., St-Cu.	225	...	...	...
21	7 35	200	6	140	5°0	150	8°0	175	10°5	200	10°0	190	6°0	...	...	8 10	Cu.	170	...	Ci-Cu.	...
25	16 25	?	?	15	7°5	15	6°0	30	16°0	30	12°0	5	5°0	25	13°5	...	Cu., St-Cu.	190	8°5	...	...
27	16 5	20	10	20	5°0	10	9°0	360	11°0	355	12°0	345	15°5	350	23°0	...	St-Cu.	360	...	A-St.	360		
28	8 0	35°	9	calm	30	5°0	360	8°0	355	9°5	340	15°0	350	18°5	8 45	{ Cu., St-Cu.	360	...	Ci-Cu.	360			
29	7 30	30	13	calm	25	6°0	30	13°0	10	7°0	10	8°5	360	16°5	...	A-Cu.	350	7°0	...	...	
29	11 20	40	7	60	6°0	40	7°0	30	7°5	40	7°5	20	11°0	360	15°0	...	St-Cu.	...	...	Cu.	45
30	7 45	50	7	185	1°9	65	6°0	80	5°5	60	4°5	80	1°4	10	4°7	...	Cu.	...	...	...	Ci-St., Ci-Cu.
30	11 35	60	8	calm	80	5°5	...	...	80	8°5	80	8°0	90	7°0	12 45	...	Ci-Cu.	335	3°0	...	...
31	7 35	90	10	calm	85	6°0	95	11°0	95	10°0	...	...	...	...	...	Cu.	90	...	...	...
31	14 50	60	7	45	6°5	55	8°0	70	7°0	20	9°5	35	10°5	25	13°0	...	Cu.	70	...	...	...
(For observations at lower levels, see above.)																							
7	9 50			100	6°0	85	14°5	75	13°0	105	12°0	...	...	...	...	...	Cu.	...	...	...	...
9	7 30			10	14°5	15	19°0	...	...	...	...	...	...	...	...	...	Cu.	20	...	...	...
9	16 5			360	17°0	360	22°0	355	23°5	...	...	...	...	...	...	...	Cu.	30	5°5	...	...
16	12 35			315	13°0	320	10°0	...	...	...	...	...	...	...	...	...	Cu., St-Cu.	315	...	...	...
25	16 25			15	14°0	15	20°0	...	...	...	...	...	...	...	...	...	Cu., St-Cu.	45	...	...	...
28	8 0			335	20°0	...	...	...	...	...	...	...	...	...	...	8 45	{ Cu., St-Cu.	360	...	Ci-Cu.	360
29	7 30			350	25°0	340	27°0	...	...	...	...	...	...	...	...	A-Cu.	350	7°0	...	...	
29	11 20			340	20°0	345	26°5	...	...	...	...	...	...	...	...	St-Cu.	...	...	Cu.	45	
30	7 45			340	10°5	320	13°0	320	20°5	320	21°5	320	25°5	...	...	...	Ci-St., Ci-Cu.	315	...	...	...
30	11 35			60	4°8	360	7°5	345	13°5	335	21°0	340	24°5	12 45	...	...	Ci-Cu.	335	3°0	...	...

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN.

Day and Hour, G.M.T.	Type of Cloud.	Velocity-height-ratio.					Remarks.	
		Degrees from N.	Milliradians per Second.	Components.				
				W.-E.	S.-N.			
2	{ False Ci. Cu-Nb.	130 295	mr/s. 2°0 10°0	mr/s. - 1°5 + 9°1	mr/s. + 1°3 - 4°2		False Ci., showing bright parhelia at times.	
3	Ci-Cu.	305	2°4	+ 2°0	- 1°4		Hazy, indefinite Ci-Cu.; fused to A-St. later.	
4	St-Cu.	250	3°6	+ 3°4	+ 1°2		Fused St-Cu.	
6	False Ci.	300	2°8	+ 2°4	- 1°4		False Ci. became Ci-Cu. later.	
8	Fr-Cu.	330	10°0	+ 5°0	- 8°7			
9	Cu-Nb.	345	8°3	+ 2°1	- 8°0		Apical part measured.	
10	Cu. to Cu-Nb.	344	11°0	+ 3°0	- 10°0		Central mass measured.	
11	Cu. to Cu-Nb.	349	3°6	+ 0°7	- 3°5		Apical part measured.	
14	False Ci.	326	1°0	+ 0°4	- 0°8		False Ci. formed from Cu-Nb. apex.	
15	False Ci.	355	2°4	+ 0°2	- 2°4		False Ci. from Cu-Nb. apex.	
21	A-Cu.	313	5°0	+ 3°6	- 3°4		Incipient high A-Cu.	
22	St-Cu.	263	3°1	+ 3°1	+ 0°4		Fused lenticular St-Cu.	
25	Fr-Cu.	330	10°0	+ 5°0	- 8°7			
27	Cu-Nb.	3	17°0	- 1°0	- 17°0		Basal part measured.	
28	Cu-Nb.	18	6°5	- 2°0	- 6°2			
29	Cu.	62	8°2	- 7°2	- 3°9			
30	{ A-Cu. Cu.	66 69	4°8 9°3	- 4°4 - 8°7	- 1°9 - 3°3		A-Cu. to high St-Cu. Cu. to small Cu-Nb.	
31	St-Cu.	8	6°7	- 0°9	- 6°6		Slight Cu. below.	

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.			Aurora Observations.	Remarks.	
			Eskdalemuir.	Richmond.	Station.			
1	p.	..	2, 2	2, 2	Eskdalemuir Glasgow (and other Scottish stations) Lisburn Armagh Bidston Dublin (city) Clongowes Wood Holyhead Birmingham Sparkhill Seskin (Carrick-on-Suir) Tenbury Waterford Valencia Observatory Ross-on-Wye Haverfordwest Roche's Point Rouston Tavistock Sheepstor Newquay Aberdeen Southport Banff Balmoral Eskdalemuir Donaghadee Aberdeen Edinburgh Skegness Deerness Banff Gordon Castle Inverness Aberdeen Aberdeen Braemar Gordon Castle		23 h. 30 m. Brilliant, with curtains. 21 h.	
2	a.	D	2, 2	2, 2		Bright. 19 h. 50 m. onwards. 21 h. Very fine. 20 h. 15 m.-24 h.	From 21 h. 50 m. Pearly lustre, fairly bright, occasional rifts. From 23 h. 20 h.-23 h. 20 h.-24 h. Brilliant W. to N., reaching nearly to Polaris. 22 h., towards NNE. 21 h.-22 h. Fairly brilliant. From 20 h. Greenish arch in NW. and N.	
2	p.	..	2, 2	2, 2		23 h. 21 h.-23 h. Bright in North. 22 h.-22 h. 30 m. Greenish white bands, streamers much lighter. Bright. 24 h. Just showing behind dark, low cloud.	Early morning till 3 h. Bright streamer curtains and corona.* o h.-3 h. Very brilliant display.	
2	p.	..	2, 2	2, 2		21 h. Very faint. 20 h. Vivid.		
4	p.	..	2, 2	2, 2		20 h.-23 h. Glow, rather extensive, moderately bright.	20 h.-23 h. Glow type, faint.	
5	p.	..	2, 2	2, 2		19 h. 30 m.	19 h. 30 m.	
6	p.	..	2, 1	2, 1			19 h.-23 h. Arch and streamer curtains, bright. 21 h. Faint glow.	
8	p.	..	1, 1	1, 2				
9	p.	..	..	..	
12	p.	..	0, 0	0, 0	Glasgow Deerness	22 h.		
15	p.	..	1, 1	1, 2	Aberdeen Cheltenham	After 20 h. Glow type, faint. 21 h.		
16	p.	..	..	2, 1	Eskdalemuir ..	20 h.-21 h. Glow.	
16	p.	..	1, 1	2, 1	Deerness Aberdeen Meltham Bidston Tenbury	21 h.-23 h. Glow type, moderately bright.		
17	p.	..	1, 1	1, 1	Oxford	19 h. 21 h. 20 h.-23 h. No streamers.		
18	a.	..	1, 1	1, 1	Eskdalemuir ..	1 h. Faint glow.		
19	p.	..	0, 0	0, 0	Deerness			
23	..	..	..	..	Aberdeen ..		
23	p.	..	2, 0	1, 0	Deerness	22 h. Glow.		
25	a.	..	0, 0	0, 0	Eskdalemuir ..	Early a.m.		
26	p.	..	0, 2	1, 1	Deerness	From 18 h. Glow and arch, moderately faint.		
27	p.	..	1, 1	1, 2	Inverness	19 h.		
28	p.	..	1, 1	2, 1	Aberdeen Glasgow Meltham Valencia Observatory	18 h. 30 m.-19 h. 15 m. Slight. 19 h. Glow.		
					Deerness Deerness			

Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at midnight of the night in question.

* Aberdeen, night of 1st was rainy and misty, hence aurora was not seen then.



METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.

Ninth Year.—No. 11. NOVEMBER 1919.]

Units based on the C.G.S. System.

[Price 1s.]

1. SUNSHINE AND SOLAR RADIATION.

Day.	WESTMINSTER. SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.					RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.					ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.					CAHIRCIVEEN.		
	Bright Sunshine.*		Radiation received on Horizontal Surface by Callendar Radiograph.			Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.			Bright Sunshine.*		Radiation by Ångström Pyrheliometer.			Bright Sunshine.*		
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.	Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	p sec Z.	Intensity.	Total.	Per cent. of Possible.
I	hr. 0'1	% 2	j/cm². 208	% 17	mw/cm². 20	h. 12	m. 50	mw/cm². 16	hr. 0'9	% 10	... ...	hr. 3'1	% 32	h. m.	...	...	hr. 7'8	% 81
2	1'8	19	267	22	28	11	40	28	1'2	13	...	4'0	44	...	...	...	x 8'3	87
3	0'0	0	172	14	16	11	30	16	0'0	0	...	0'5	6	...	...	...	4'8	51
4	0'0	0	44?	4	4?	9	45?	2?	0'0	0	...	0'0	0	...	...	...	7'4	79
5	0'0	0	165?	14	21?	12	30?	21?	0'0	0	...	0'0	0	...	...	...	7'5	81
6	0'0	0	221	19	15	12	44	14	0'0	0	...	1'0	II	...	...	...	6'1	66
7	0'0	0	57	5	4	14	10	2	0'0	0	...	0'0	0	...	...	...	5'0	54
8	0'0	0	48	4	3	10	35	2	0'0	0	...	0'2	2	...	...	...	6'9	75
9	0'0	0	50	5	5	9	8	4	0'0	0	...	0'0	0	...	...	...	0'0	0
10	0'0	0	n 29	3	3	12	38	1	0'0	0	...	6'8	78	...	...	...	6'4	71
11	1'3	15	274	26	29	12	15	29	3'6	40	...	6'3	73	...	...	...	4'2	47
12	2'0	22	x 359	35	26	11	15	24	3'9	43	...	0'0	0	...	...	...	1'9	21
13	0'7	8	264	3	21	12	25	21	4'4	49	27	10	Thro' Cl.	3'3	39	...	7'5	84
14	0'0	0	230	23	20	11	25	20	0'1	1	...	4'6	55	...	...	...	7'6	87
15	0'0	0	201	21	16	13	40	10	0'1	1	...	x 7'0	84	...	...	...	4'0	45
16	2'1	24	296	31	27	12	30	27	4'6	52	...	0'0	0	...	...	...	0'0	0
17	0'0	0	83	9	7	9	37	6	0'0	0	...	0'0	0	...	...	...	0'0	0
18	1'2	14	292	32	19	10	30	18	2'5	29	13	4	Thro' Cl.	2'4	30	...	0'0	0
19	0'0	0	99	11	5	10	50	4	0'0	0	...	0'3	4	...	...	...	3'0	35
20	3'8	44	326	37	25	12	30	25	5'5	64	61	20	Clear	4'2	53	...	3'2	38
21	3'8	45	321	37	28	11	50	28	x 5'7	66	56	18	Clear	5'5	69	...	0'0	0
22	0'0	0	59	7	5	8	57	4	0'0	0	...	1'8	23	...	...	...	0'0	0
23	0'0	0	109	13	13	12	0	13	0'3	4	...	0'0	0	...	...	...	0'0	0
24	2'5'2	62	307	37	24	11	58	24	4'9	58	54	17	Clear	0'1	1	...	3'1	37
25	1'7	21	226	28	21	12	16	21	1'9	23	60	18	Clear	0'0	0	...	2'2	27
26	2'3	28	224	28	17	12	57	16	5'1	62	44	13	Hazy	2'4	31	...	1'2	15
27	0'0	0	41	5	5	14	8	3	0'0	0	...	4'9	64	...	...	...	5'7	70
28	0'0	0	41	5	6	13	8	4	0'0	0	...	2'1	28	...	...	...	2'5	31
29	1'1	14	131	7	24	11	38	24	0'5	6	...	0'4	5	...	...	...	4'8	60
30	0'0	0	172	22	14	11	0	12	0'0	0	...	0'0	0	...	...	...	0'0	0
Means	0'90	11	177	17	16	—	—	15	1'51	17	—	—	—	2'03	34	—	3'70	41
Normal	1'00	12	230	24	—	—	—	1'73	20	—	—	—	1'83	23	—	—	2'17	25
← 35 years →		← 7 years →		← 35 years →		← 35 years →		← 5 years →		← 35 years →		← 45 yrs.		← 45 yrs.		← 35 years →		

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9'1 m. H_b = 13'7 m. H_a = 26'4 m. Above Ground: h_t = 1'3 m. h_r = 0'56 m. h_a = 13'9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.		Humidity.				Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0–10) and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.		
	9 h.		21 h.		9 h.	21 h.	Vapour Pressure.	Percentage.	9 h.	21 h.	9 h.	21 h.	mm.	200+			
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	mm.	200+			
1	mb. 1031'4	mb. 1031'2	a. 78'8	a. 77'7	82	76	6'5	6'6	71	77	80	7	—	1	0	72	Fine and almost cloudless n. and day.
2	1029'0	1023'3	78'4	77'7	81	77	6'0	6'9	67	81	90	5	—	1	9	73	Fine n. and day. Fine to o. evening.
3	1016'6	1013'3	79'1	77'9	81	76	7'2	6'8	76	79	95	6	70	5	7	73	o. to c. n. Fair to fine day.
4	1008'5	1004'7	77'3	78'1	80	75	6'7	6'9	81	79	85	6	75	5	8	72	Fine n. and morning and —. Fine day.
5	1003'6	1001'6	76'5	77'2	79	76	6'0	6'4	77	78	90	2	85	5	0∞	73	Fine n. and morning. Fine and ∞ day.
6	1000'6	1001'5	76'0	76'4	80	74	6'5	6'5	86	84	55	3	—	1	300	73	Fine and — n. Fine and ∞ day.
7	1001'8	1000'9	72'2	76'3	80	71	5'8	6'8	100	89	60	2	—	1	100	70	Fine and — n. Fine a. Fine to ● p.
8	1001'0	1002'9	74'5	73'1	79	71	6'2	5'2	91	85	—	1	4	2	—	71	Fine and — n. Fair to fine day. 12th
9	1002'1	1002'6	78'8	76'5	80	72	7'0	6'7	76	86	315	10	5	3	10	68	Fine and — n. o. p. h. day. < p.
10	1010'8	1015'9	76'2	75'5	79	75	6'4	5'8	84	80	30	4	7	4	6	72	Fine n. Fair to fine day.
11	1015'7	1015'4	71'0	71'4	78	69	3'7	3'6	70	67	—	1	8	2	5	n 66	Fine and — n. Fair to fine day.
12	1013'2	1013'0	72'0	73'4	78	n 69	4'2	5'7	74	91	80	3	—	1	6	2'8	n 66
13	1013'8	1012'6	72'7	73'0	72	4'5	4'6	76	75	65	3	2	4	—	—	68	Fine and — n. Fair to fine day. 12th
14	1012'3	1014'9	73'6	73'7	n 76	72	5'1	4'5	80	70	100	5	45	3	0	68	Very fine n. and day.
15	1016'0	1024'6	71'5	73'5	78	71	4'3	4'9	78	78	80	2	—	1	6	68	Fair to fine day. < p.
16	1028'5	1027'5	74'2	82'9	83	71	5'1	10'8	77	89	355	3	270	7	10	68	Fine n. Fair to o. morning. ● p. day.
17	1024'4	1016'0	83'6	83'8	84	82	11'0	11'8	87	92	230	9	275	6	10	70	81
18	1019'9	1015'4	81'8	83'0	84	81	9'5	10'7	84	88	250	5	225	6	10	79	o. and p. to b. c. n. o. to e. day. ● evening.
19	1008'5	1007'9	82'8	81'8	84	81	10'6	8'8	88	78	245	9	265	11	7	79	● to p. n. c. and p. day.
20	1009'2	1014'8	80'3	81'4	82	79	7'6	7'9	74	72	305	11	285	9	8	76	p. and q. n. ▲ and p. day. Fine evening.
21	1014'7	1011'6	82'4	83'5	84	82	10'9	12'4	93	98	280	6	190	2	10	78	d. n. p. morning. d. a. ● p. [ing].
22	1015'5	1016'0	84'2	84'7	85	x 83	13'1	13'1	99	96	240	5	235	6	10	81	≡ 0 and d. morning. o. day. o. d. p. even-
23	10																

3. METEOROLOGY :—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28' N.$ Long. $0^{\circ} 19' W.$ Heights above Mean Sea Level :—Rain-gauge Site, H = 5.5 m. Barometer, H_b = 10.4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground :—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.			
							Vapour Pressure.	Percentage.	9 h.	21 h.	9 h.	21 h.						
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.				
1	mb.	mb.	a.	a.	a.	a.	millibar.	%	%	m/s.	°	m/s.	mm.	a.	200+			
1	1026.6	1026.1	75.8	77.6	79	74	6.5	6.7	88	360	34	20	5	10	0.5	69	o. to 15 h., improved. ● 13 h. o. n.	
2	1022.6	1016.1	78.0	77.0	80	76	7.0	6.9	81	10	5	10	5	10	0.4	73	● 1 h. 50 m.-5 h. 25 m. and from 7 h. 35 m.-7 h. 40 m. Dull	
3	1011.4	1009.8	75.6	75.1	77	75	6.6	6.5	90	91	30	4	30	3	10	2.3	74	● 6 h. 25 m.-15 h. 15 m. Fair to fine. [to fair to fine.
4	1009.2	1007.1	74.8	77.7	78	74	5.9	7.7	86	91	30	2	80	5	10	0.1	73	≡ ⁰ —early. ● from 13 h. (gusts) 21 h. 40 m.-3 h. 15 m.
5	1003.9	999.3	78.0	78.0	80	76	6.8	7.2	78	70	6	40	6	? 10	0.7	73	↗ (gusts) o. -3 h. 15 m. ● o. h. 45 m.-2 h. 55 m. q. 2 h. 30 m.	
6	995.5	997.0	77.9	78.6	80	77	7.4	8.4	85	93	10	4	360	2	10	—	76	≡ ⁰ early. ≡ 9 h. o. all day. ≡ ⁰ n. [Fine a.
7	998.5	1000.2	78.7	78.8	80	78	8.4	8.3	93	90	360	2	20	2	10	0.6	77	≡ ⁰ a. ≡ p. ≡ ⁰ n. Fine to 12 h. 45 m., then ≡.
8	1000.0	1001.8	78.6	78.3	80	78	8.6	8.4	95	94	—	1	20	2	10	—	77	● o. h. 30 m.-o. h. 35 m. ● 6 h. to about 10 h. 40 m. Dull
9	1001.6	1001.6	79.0	76.6	79	76	8.4	6.7	90	85	80	3	50	5	10	0.5	77	≡ ⁰ —early. Fine all day.
10	1001.1	1007.4	77.0	74.7	77	74	7.0	5.7	87	83	10	6	350	4	10	0.6	75	Fine early. ≡ about 9 h. Fine to fair a. Dull p.
11	1009.6	1010.4	73.7	72.5	76	72	5.0	4.6	78	78	340	3	350	3	10	—	68	● 5 h. 35 m.-6 h. 5 m. ● d. 14 h. 50 m.-15 h. 18 m. ● 15 h. [25 m.-19 h. 30 m.
12	1010.7	1008.3	71.6	73.8	77	70	4.3	4.8	78	75	350	3	250	2	? 10	—	n 64	□ early. ≡ ⁰ till 9 h. Fine day. ≡ ⁰ n.
13	1008.5	1011.5	73.3	72.8	76	72	5.9	5.0	95	84	—	1	—	1	4	0	68	□ early. ≡ a. Fine p. ≡ ⁰ n.
14	1010.9	1008.6	73.4	75.1	76	73	5.6	5.3	89	76	30	3	30	5	6	—	66	≡ ² to 11 h. 10 m., then fine all day. ≡ n.
15	1006.8	1013.6	74.8	74.2	76	74	4.3	5.9	63	89	10	8	350	5	10	0.2	72	≡ ² early. ≡ to 9 h. 30 m. Fine later.
16	1024.5	1022.5	71.0	74.3	77	70	4.3	6.5	81	96	310	2	190	3	0	2.3	n 64	□ early. Dull to cloudy to 9 h. 30 m. Fine n.
17	1022.7	1016.5	76.6	81.9	83	75	7.2	10.4	92	92	—	1	220	7	10	3.8	70	≡ ⁰ a. Dull and overcast all day. [later.
18	1015.6	1018.9	80.5	78.3	84	79	8.1	8.1	79	91	280	3	250	4	3	0.5	76	Fine, with ≡ to 9 h. 45 m. Dull and overcast
19	1007.9	1005.5	81.7	81.6	85	78	10.5	9.5	94	85	200	7	230	5	10	3.3	74	Dull, with ≡ ⁰ a. Fine p., with ≡. ≡ n.
20	998.8	1003.2	79.5	77.1	81	76	8.2	6.1	85	76	250	5	270	7	4	0.4	77	≡ ⁰ early. ≡ ² greater part of day and at n.
21	1008.7	1012.8	76.4	75.4	80	74	6.2	6.0	80	82	260	4	280	2	3	0.1	70	≡ ² to 10 h. 30 m. Fine later, with ∞ . ≡ ⁰ n.
22	1010.8	1011.7	78.5	82.7	84	74	8.4	10.7	94	89	220	5	240	6	9	0.7	68	≡ ⁰ early. Fine, with ∞ day. ≡ ² n.
23	1012.0	1008.7	84.3	85.7	x 87	x 83	11.4	12.7	86	87	240	4	220	6	10	0.4	77	≡ ² to 10 h. 15 m. Fine later. [midnight.
24	1009.4	1002.2	79.6	80.5	86	79	8.0	9.0	82	87	210	4	210	5	0	—	74	Overcast day, with ≡. ● from 17 h. 30 m. to
25	994.9	993.4	78.8	76.9	82	75	8.3	7.0	90	86	230	3	230	5	7	0.1	67	● early. ● p. 12 h.-14 h. Fair to fine. o. Fine n.
26	994.7	996.0	74.1	72.3	79	71	6.2	5.7	95	98	240	2	—	1	0	—	67	□ early. ≡ a. o. ≡ ⁰ p. ● 14 h.-21 h. 50 m.
27	996.8	996.3	72.1	75.1	n 75	n 70	5.7	6.6	100	93	270	2	—	1	10	—	67	Overcast to 11 h. Fine to cloudy later.
28	998.9	1002.3	73.8	73.9	76	72	6.1	6.3	94	96	330	2	—	1	10	—	69	● 5 h.-20 h., with some breaks. Dull all day.
29	998.4	1008.9	75.5	74.8	79	73	6.7	6.3	93	91	80	3	260	2	10	0.1	70	● 5 h.-30 m.-6 h. ● d. 7 h. 30 m.-8 h. ● p. roh. tom. ≡ to 9 h.
30	1016.0	1014.9	71.7	78.8	80	71	5.6	7.9	100	86	—	1	170	5	10	—	66	≡ ⁰ a. Dull to 11 h. 30 m. Fine to cloudy. ≡ n. [30 m. o.
Means	1008.9	1009.1	76.5	77.0	79.6	74.5	7.0	7.2	87	87	3.3	—	3.7	7.3	6.4	26.6	71.6	Monthly Totals or Means.
Normal	1013.3	1013.2	79.1	79.3	82.3	76.6	8.4	8.5	88	87	3.3	—	3.2	—	—	56.5	—	Normals.

4. METEOROLOGY :—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19' N.$ Long. $3^{\circ} 12' W.$ Heights above Mean Sea Level :—Rain-gauge Site, H = 242 m. Barometer, H_b = 237.3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground :—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Vane of Anemometer, h_a = 15 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.			
							Vapour Pressure.	Percentage.	9 h.	21 h.	9 h.	21 h.						
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.				
1	1005.5	1005.7	76.5	72.7	79	72	6.7	5.3	85	88	20	4	—	1	8	0.1	70	o to c, op a; b after 15 h.; — n.
2	1001.1	996.7	76.6	75.9	78	74	6.5	6.9	83	91	20	9	50	2	4	0.7	68	p, bc, a; c to o, ● p and n.
3	992.7	988.4	75.5	75.0	78	75	6.7	6.5	91	93	30	6	30	9	9	1.6	72	o to e, ● p a and p; p, n.
4	983.5	980.9	76.5	74.4	78	74	7.2	6.4	92	95	50	5	30	4	10	4.0	73	o, occasional ● p a, p, n.
5	981.4	978.3	74.8	75.7	77	74	5.9	6.7	86	90	40	3	20	3	10	0.2	73	≡ ⁰ a; ● ≡ ⁰ g p; ● p n.
6	974.5	974.2	76.1	74.2	78	74	6.8	6.2	89	93	50	7	360	2	10	1.2	74	● ≡ ⁰ a; o ● ⁰ p; c p, n.
7	973.8	973.4	74.2	77.7	74	74	5.8	6.2	87	93	10	4	—	0	10	0.2	72	o all day. ● * 21 h.
8	972.8	974.0	70.4	72.8	75	69	5.1	5.5	100	92	—	0	—	1	9	0.6	69	● * ≡ ⁰ V a; ≡ ⁰ o to be p and n.
9	977.9	981.9	73.4	73.6	75	73	6.0	6.0	95	94	70	5	50	8	10	3.0	69	≡ ⁰ o; * 8 h a; o, bc, ● * p p and n.
10	986.0	985.7	74.0	72.2	75	71	5.1	3.8	79	66	30	8	360	3	6	1.0	72	● * ≡ ⁰ b; * 8 h a; bc, be, \square p and n.
11	985.4	986.1	71.9	70.0	74	66	4.3	3.8	76	77	360	4	—	0	2	0.5	68	≡ ⁰ b * b ∞ a and p; be, \square , \triangle n.
12	979.4	980.5	69.8	70.6	66	72	4.8	4.4	100	86	—	0	30	6	10	6.8	64	o, * ∞ ∞ a and p; c, * \square 7 cms. n.
13	984.2	985.9	71.3	69.1	73	68	3.4	3.0	62	67	10	5	360	3	6	1.1	65	o, *, bc ∞ , \square 10 cms. a, p, n.
14	987.2	987.7	68.1	70.2	n 72	68	4.2	4.6	100									

NOVEMBER 1919.

5. GEOPHYSICS :—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.						Magnetic Character of Day.	Electric Character of Day.	Charge per cc. $\times 10^{20}$. + . | - .	Air-Earth Current $\times 10^{16}$.	Potential Gradient, Volts per metre. Factor 2.20.							
					Horizontal Comp't.		Declination.		Inclination.													
	0.3 m.	1.2 m.	Daily Mean.	Extremes.	Mean Time.		Mean Time.	West.	Mean Time.	North.					About 15 h.	About 15 h.	3 h.	9 h.	15 h.	21 h.		
1	a. 200+	a. 78.7	cm. 202	cm. 82.7	h m ...	γ ...	h m ...	◦ , ...	h m ...	◦ , ...	o o	i 2	coulomb. o'29	amp/cm². o'35	v/m. 270	v/m. 455	v/m. 580	v/m. 500				
2	78.6	82.6	201	...	...	...	...	...	...	...	i o	i o	...	...	255	295	150	375	
3	78.5	82.5	199	...	...	...	...	...	...	...	2 o	o i	...	...	z— 270	685	580	580	
4	78.2	82.4	198	...	...	...	...	...	...	...	o o	o i	...	...	110	580	550	500	
5	78.0	82.2	196	...	...	...	...	...	...	...	o o	o i	...	...	455	430	175	325	
6	78.4	82.1	195	...	11 21	18386	14 23	14 38'3	14 29	66 58'3	o o	o o	...	...	295	350	230	175		
7	77.9	81.9	194	...	...	...	...	...	...	...	o o	o? o	...	...	o'60	135	—	430	
8	79.1	81.9	194	...	...	...	...	...	...	...	o o	o i	...	...	190	240	365	375	
9	79.0	81.9	193	...	...	...	...	...	...	...	o o	o i	...	...	190	325	110	375	
10	78.9	81.9	193	...	...	...	...	...	...	...	o o	o i	o'47	o'10	o'65	175	z+ 590	540	540
11	77.6	81.8	195	...	...	...	...	...	...	...	i o	o o	o'04	o'37	1'05	215	375	480	540
12	76.7	81.8	200	...	...	...	...	...	...	...	i o	i o	o'14	o'12	o'80	375	590	590	255
13	76.0	81.6	204	...	11 10	18401	14 18	14 39'9	14 27	66 57'6	o o	o i	o'35	o'10	1'60	540	550	540	805			
14	76.0	81.4	207	...	...	...	...	...	...	...	o o	o i	o'39	o'08	1'20	295	—	620	805
15	76.0	81.3	208	...	...	...	...	...	...	...	o o	o i	...	...	325	415	675	z± z±	z±
16	76.0	81.3	207	...	...	...	...	...	...	...	2 i	...	...	...	190	405	415	-510	-510
17	75.8	80.9	206	...	...	...	...	...	...	...	i i	i o	...	...	310	645	365	-40	-40
18	78.0	80.9	204	...	...	...	...	...	...	...	i i	i o	o'10	o'10	o'50	25	415	350	455
19	77.9	80.7	201	...	...	...	...	...	...	...	o o	o i	o'21	o'18	o'90	270	230	200	215
20	78.8	80.8	200	...	...	...	...	...	14 33	66 56'9	o o	o i	o'41	o'21	o'70	135	350	270	255
21	77.6	80.8	198	...	11 8	18411	14 23	14 39'8	...	...	i o	i o	o'08	o'23	o'70	200	375	325	580	
22	76.7	80.7	197	...	...	...	...	...	...	...	i i	...	...	...	375	415	430	390	390
23	78.3	80.7	196	...	...	...	...	...	...	...	i i	...	...	...	95	215	135	200	200
24	79.8	80.7	196	o o	o i	o'21	o'18	o'80	500	415	485	485	485		
25	79.4	80.6	195	o o	o i	o'37	o'10	o'45	160	510	120	430	430		
26	78.0	80.8	194	i i	i i	o'18	o'33	o'55	270	540	325	-175	-175		
27	76.8	80.7	193	...	11 24	18411	14 23	66 57'9	o o	i i	o'55	o'41	o'35	550	270	565	480	480		
28	76.2	80.6	193	12 15	14 38'6	...	o o	i i	o'49	o'70	o'60	725	550	700	820	820		
29	76.2	80.6	192	12 15	14 38'6	...	o o	2 i	z± z±	240	590	590	590	590		
30	76.0	80.5	191	...	...	...	...	...	...	...	o o	o i	...	...	390	455	860	455	455
M.	77.6	81.4	—	—	—	—	—	—	—	—	—	—	—	—	—	265†	419†	386†	333†	333†		
	79.8	83.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

† Mean for 24 days.

6. GEOPHYSICS :—ESKDALEMUIR.

Day.	North Component.			West Component.			Vertical Component.			Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 6.48.									
	Maximum. 15000 γ+.	Minimum. 15000 γ+.	Range.	Maximum. 4000 γ+.	Minimum. 4000 γ+.	Range.	Maximum. 44000 γ+.	Minimum. 44000 γ+.	Range.			3 h.	9 h.	15 h.	21 h.						
	h m	γ	h m	h m	γ	h m	γ	h m	γ	h m	γ	h m	v/m.	v/m.	v/m.	v/m.					
1	19 56	1004	961	11 50	43	13 51	877	840	to 1 10 20	37	16 40	1071	1059	2 15 3	12	o i	1 b	135	115	215	350
2	5 37 {	1003	967	10 56	36	23 o	885	839	23 34 {	46	22 0	1074	1053	23 25	21	o o	2 c	115	180	-515	0
3	18 37	1012	972	12 33	40	14 43 {	891	851	9 17 {	40	9 34	1070	1060	0 0	10	o o	2 c	20	165	255	130
4	17 25	1082	913	17 49	169	16 35	1036	834	18 34 {	202	17 25	1350	1052	11 40	298	i i	2 c	-15	105	35	235
5	19 7	985	962	10 38	23	11 54	875	835	2 41 {	40	11 43	1078	1050	0 40	28	o o	1 a	120	280	175	225
6	21 57	994	962	12 0	32	12 18	871	839	9 42 {	32	9 15	1074	1067	11 38	7	o o	2 c	25	-95	40	230
7	19 28 {	1000	966	10 10 {	34	13 47	874	846	9 44 {	28	14 0	1071	1063	18 25	8	o o	1 a	70	320	160	255
8	17 51	1013	985	10 45	28	13 10	893	853	8 47 {	40	1 i 0	1068	1057	11 20	11	o o	1 b	140	320	235	195
9	19 50 {	1004	975	11 15	29	12 38	883	852	0 47 {	31	1 i 10	1068	1060	19 0	8	o o	1 c	330	z± 130	345	345
10	21 14 {	990	975	10 30	15	13 37	883	851	3 56 {	32	15 26 {	1065	1059	10 47	6	o o	1 c	120	190	70	990
11	21 17 {	1015	934	18 23	81	15 52	915	796	22 3 {	119	17 26	1124	1052	23 37	72	i i	1 b	465	220	480	870
12	1 37	1029	942	15 11	87	6 5	902	784	2 7 {	118	15 40	1093	1016	1 50 {	77	i i	1 c	170	z— 10	265	265
13	5 25	1003	962	11 31	41	12 40	881	853	0 10 {	28	16 10	1075	1059	10 20	16	o o	1 b	420	355	645	1045
14	6 29	1007	984	12 35	23	12 54	878	858	0 11 {	20	20 20	1068	1061	11 10	7	o o	o a	495	425	245	660
15	20 50	1032	969	12 21	63	13 40 {	885	837	20 5 {	48	20 12	1070	1058	3 0	12	o o	o a	435	295	230	405
16	21 48	1070	937	22 12	133	16 42	932	761	22 17 {	171	21 36	1124	1051	10 40	73	i i	1 b	140	305	805	105
17	20 46	1065	944	1 22	121	13 57	891	737	20 35 {	154	20 30	1086	1053	1 18	33	i i	2 c	185	-115	z— 30	30
18	18 8	1029	942	17 35	87	14 9	892	753	17 59 {	139	18 0	1097	1061	0 1	36	i i	2 c	90	255	-75	z

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$ Heights above M. S. L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1.48 m. h_r = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.						Min. Temp. on Grass	Percentage of Humidity.			Rain 0 h. to 24 h.	REMARKS.	Earth Current Character.	
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.	Mean of 5 Readings.		9 h.†	14 h.	21 h.	Mean.			
1	1018.6	1017.1	1017.0	1017.6	79.5	78.5	77.2	81.0	76.9	78.7	75.5	71	81	79	77	1.8	• 5 h., 14 h., 21 h.	0
2	1013.3	1011.1	1009.0	1011.1	79.6	79.2	78.4	81.0	75.6	78.8	73.7	67	66	80	71	0.7	• 4 h. 30 m.	0
3	1004.5	1003.6	1003.5	1003.9	78.9	78.6	77.3	79.3	77.2	78.4	74.4	77	83	87	82	3.4	• 4 h. 20 m. to 16 h.	0
4	1001.8	999.3	997.8	999.6	78.9	81.1	79.5	81.9	76.0	79.5	74.7	85	65	63	71	—	• 10 h. Δ 18 h.	1
5	992.5	990.6	988.7	990.6	78.7	82.0	81.8	82.0	77.0	80.3	72.9	94	91	97	94	10.1	• 2 all day.	0
6	989.3	989.8	991.4	990.2	81.1	81.4	80.5	82.0	80.3	81.2	80.8	94	88	87	90	2.2	• 2 10 h.	0
7	993.0	993.3	994.2	993.5	81.0	82.6	81.0	83.4	80.0	81.6	78.9	90	70	84	81	1.0	• 4 h. \equiv and ugly 8 h. 30 m.	0
8	993.8	995.2	995.9	995.0	79.0	81.6	79.2	83.9	79.0	80.5	78.0	97	77	89	88	x 16.0	• 2 1 h. 15 h. Δ • 2 1 h. u. cloud Δ 23 h.	0
9	994.2	994.1	993.7	994.0	79.4	81.9	79.6	83.5	78.3	80.3	76.1	83	62	72	72	4.5	Δ 4 h., frequent showers. [and n.]	0
10	993.8	995.8	999.4	996.3	79.2	80.1	78.3	80.4	77.0	79.0	71.5	83	76	81	80	8.0	Squall midnight. Δ 8 h. 30 m. • 10 h. Δ 15 h. Squall 9 h. * 11 h. 45 m. * 15 h. [21 h.]	1
11	1005.1	1004.7	1004.5	1004.3	76.9	76.4	76.0	78.0	n 74.0	76.3	73.3	53	73	74	67	3.0	[21 h.]	0
12	1005.8	1005.5	1005.1	1005.5	76.5	78.2	75.5	79.1	74.5	76.8	70.9	62	47	60	56	6.0	* 7 h. \boxtimes 9 h.	1
13	1003.5	1003.2	1003.8	1003.5	78.3	79.7	76.0	81.2	75.0	78.0	n 66.2	57	73	69	69	3.0	• n. Δ 1 h. 40 m.	0
14	999.7	996.6	996.9	997.7	76.2	77.2	76.0	77.7	75.1	76.4	69.0	83	66	67	72	—	Δ 4 h.	0
15	997.9	1005.0	1007.9	1003.6	76.4	76.6	77.4	77.5	75.8	76.7	72.5	63	55	54	57	2.0	* 9 h.-11 h.	1
16	1020.9	1023.3	1020.7	1021.6	77.9	79.8	79.2	81.2	74.6	78.5	71.6	48	n 45	89	61	5.0	Δ 2 n. \bullet 2 20 h.	0
17	1021.4	1021.8	1019.8	1021.0	84.0	84.1	83.1	x 85.8	81.2	83.6	73.6	86	90	88	75	• 4 h. \bullet 2 13 h.-20 h.	1	
18	1015.5	1017.0	1017.5	1016.7	83.5	83.9	82.3	84.5	82.3	83.3	81.3	80	75	80	80	3.0	\bullet 2 4 h. to 6 h.	0
19	1009.9	1007.1	1007.1	1008.0	84.3	83.4	83.6	85.0	81.9	83.6	75.8	95	98	90	94	3.6	\bullet 2 4 h. \equiv 2 14 h.	0
20	1001.0	1001.4	1005.4	1002.6	82.9	81.9	80.5	83.5	80.3	81.8	78.6	70	56	54	60	3.5	\bullet 2 4 h. Squall Δ 2 9 h. Δ 18 h. 20 m.	0
21	1006.7	1007.9	1009.8	1008.1	79.5	81.6	81.4	81.7	80.5	78.3	73.2	91	69	79	80	8.3	\equiv 2 8 h. to 10 h.	0
22	1009.9	1010.1	1012.6	1010.9	82.5	84.3	84.6	85.4	81.4	83.6	74.8	98	88	100	95	0.4	\equiv 2 8 h. to noon.	1
23	1013.8	1013.1	1011.3	1012.7	84.2	84.7	84.5	85.0	x 83.5	84.4	82.2	96	98	97	97	1.4	\bullet 4 h. \equiv 2 14 h. 30 m. \bullet 2 21 h.	1
24	1008.5	1006.1	1001.5	1005.4	83.5	84.8	82.8	85.1	81.7	77.0	77	81	88	82	82	3.2	\bullet 4 h.-9 h. \bullet 19 h.	1
25	992.2	991.1	992.3	991.9	79.3	82.1	79.7	82.7	78.9	80.5	78.1	94	67	77	79	9.4	\bullet 2 4 h. 25 m., 11 h. 30 m., 17 h.	1
26	992.2	990.9	990.2	991.1	78.1	80.0	77.9	82.0	77.4	79.1	71.4	82	66	82	77	2.7	\bullet 4 h. Δ 9 h., 11 h., 21 h.	1
27	988.7	988.5	989.3	988.8	78.1	77.4	76.0	80.0	75.0	77.3	72.9	84	85	90	86	4.5	Δ midnight, far distant. Δ 2 2 h.	0
28	992.7	994.3	996.5	994.5	78.2	79.8	78.8	80.8	n 74.0	78.3	67.4	77	72	82	77	1.3	\bullet 4 h. 30 m. Δ 8 h.	0
29	997.0	1000.2	1004.6	1000.8	81.2	81.4	80.7	82.9	77.0	80.6	71.0	73	70	65	69	4.6	\bullet 2 1 h. 30 m. \sim 9 h. \bullet 14 h.	0
30	1010.6	1011.1	1010.2	1010.6	80.5	80.1	79.6	82.4	77.7	80.1	69.6	65	77	95	79	—	[21 h.]	0
Means	1002.9	1003.0	1003.3	1003.0	79.9	80.8	79.6	82.0	77.9	80.0	74.2	79	74	80	78	120.1		
Normal	1009.3	1008.4	1009.0	1008.9	82.0	83.1	81.9	84.1	80.1	82.2	76.3	?	75	80	?	91.1		
					26 years	26 years	26 years	26 years	26 years	26 years	23 years	23 years	23 years	23 years	23 years	25 years		

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).				Mean of Force.	Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.												Mean Amount			
						Sunshine.*		Upper.		Lower.		Upper.		Lower.		Upper.					
	9 h.†	14 h.	21 h.	9 h.†		Total.	Per cent. of Possible.	Tenths.	Type.	Dirac-	Type.	Dirac-	Tenths.	Type.	Dirac-	Type.	Dirac-				
9 h.†	14 h.	21 h.	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†	9 h.†				
1	45	4	45	4	45	5	43	hr. 2'0	% 21	7	A.-Cu.	NE	Cu.-Nb.	NE	10	Cu.-Nb.	NE	10	Nb. ... 9.0
2	45	6	45	6	67	4	53	I' 1'1	II 9	A.-Cu.	ENE	Nb.	NE	10	...	...	Cu.-Nb.	NE	6	A.-Cu. NE Cu.-Nb. ... 8.3
3	23	4	45	3	45	1	27	0'0	0 10	...	...	Nb.	NNE	10	...	...	Nb.	NE	7	A.-Cu. W Cu.-Nb. WSW 7.3
4	—	0	180	2	113	4	20	3'2	33 10	Nb.	SE	2	Gi.
5	67	3	67	3	45	4	33	0'1	1 10	...	...	Nb.	...	10	...	...	St.-Cu., Nb.	SSE	10	Nb. ... 10.0
6	23	2	23	2	67	2	20	0'0	0 10	...	...	Nb.	...	10	...	...	Nb.	...	10	...
7	67	2	337	1	337	1	I' 3	I' 2	I2 10	...	...	...	...	10	A.-Cu.	WSW	St.-Cu.	...	10	...
8	45	1	225	2	45	1	I' 3	I' 2	24 10	...	...	Cu.-Nb.	WSW	10	...	...	Cu.-Nb.	WSW	10	Nb. ... 10.0
9	270	3	225	4	315	4	3'7	2'8	30 6	...	...	Nb.	WSW	8	...	...	Cu.-Nb.	W	10	...
10	45	3	23	4	45	4	3'7	3'0	10 7	A.-Cu.	NE	Cu.-Nb.	N	9	A.-Cu.	N	Cu.-Nb.	N	10	...	
11	23	4	337	3	45	3	3'3	2'2	24 7	A.-Cu.	NE	Nb.	N	7	A.-Cu.	NW	Nb.	...	8	...	
12	23	3	360	3	270	1	2'3	3'0	32 8	...	...	Nb.	...	7	...	...	Cu.	NE	3	...
13	293	3	337	2	67	2	2'3	4'5	49 5	...	...	Cu.-Nb.	NW	7	...	...	Cu.-Nb.	N	3	...
14	67	3	67	5	45	5	4'3	3'7	40 7	Ci., A.-Cu.	WSW	Cu.	ENE	7	A.-Cu.	SW	Cu.-Nb.	E	2	...	
15	45	6	23	5	23	6	5'7	0'0	10 10	...	...	Nb.	...	6	...	...	Cu.-Nb.	N	10	...
16	360	4	293	3	247	5	4'0	7'1	4	...	...	Cu.	NNW	2	...	...			

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 8' 8 m., Ground 13' 7 m., M.S.L. 19' 2 m.
Height of Cups above—Roof 4' 6 m., Ground 7' 6 m., M.S.L. 15' 2 m.

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1' 5 m., Ground 4' 9 m., M.S.L. 57' 3 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.	Day.	3 h.			9 h.			15 h.			21 h.			Vel. in Max. Hourly Run.	Time of Max.	
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.				S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.			
I	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	h	m	I	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	m/s.	hrs.
1	... 4'4	... 6'6	... 1'7	... 8'3	... 1'8	... 9'0	... 1'4	... 7'1	14'7	11	25	2	... 5'6	... 2'3	... 3'3	... 1'4	... 3'6	... 2'3	... 3'0	... 1'0	... 2'4	... 7'2	10	1'5	17, 18, 22					
2	... 1'2	... 6'1	... 5'1	... 7'6	... 6'3	... 6'3	... 2'8	... 6'7	12'7	9	45	3	... 1'8	... 0'8	... 1'8	... 1'8	... 2'0	... 2'1	... 2'0	... 2'1	... 2'1	... 2'1	4'6	24						
3	... 1'3	... 6'8	... 4'1	... 10'0	... 4'0	... 9'7	... 3'3	... 7'9	15'0	13	20	4	... 3'5	... 3'5	... 1'3	... 6'8	... 2'2	... 10'0	... 9'8	... 1'0	... 2'4	... 7'2	10	1'5						
4	... 1'2	... 6'1	... 5'2	... 5'2	... 4'9	... 1'4	... 2'2	10'1	2	50	5	... 10'2	... 9'2	... 8'5	... 6'6	... 6'6	... 6'6	... 6'6	... 6'6	... 6'6	... 6'6	10'2	3							
5	... 1'6	... 4'0	... 1'0	... 4'8	... 1'5	... 7'7	... 1'5	... 7'4	12'4	17	55	6	... 2'3	... 2'3	... 8'3	... 8'3	... 7'4	... 4'9	... 8'3	... 1'7	... 1'8	... 9	11'8							
6	... 4'9	... 5'9	... 1'0	... 4'8	... 5'2	... 10'6	... 17	55																						
7	0'6	... 2'9	... 2'1	... 2'1	... Calm	... Calm	... 6'4	6	25	7	... 7'9	... 5'3	... 9'0	... 6'0	... 8'6	... 8'6	... 9'0	... 9'0	... 15'7	23										
8	0'3	... 1'6	Calm	... 2'0	... 3'0	... Calm	10'7	14	0	8	... 12'0	... 12'0	... 14'4	... 14'4	... 5'4	... 8'1	... 4'4	... 6'6	... 20'3	9										
9	1'3	... 0'9	2'7	... 1'8	2'9	... 6'9	1'3	... 6'5	11'2	18	35	9	7'5	... 11'1	2'4	... 12'3	... 11'5	... 6'9	... 13'4	... 3, 5										
10	... 8'9	... 2'7	13'8	... 4'8	11'6	... 1'3	6'8	20'6	9	25	10	... Calm	... Calm	... 5'9	... 5'3	... 5'3	... 5'3	... 8'2	... 8'2	20										
11	10'0	2'0	9'2	6'2	6'5	6'5	3'7	5'5	18'8	3	5	11	0'9	4'5	... 2'3	... 2'3	... Calm	... Calm	... 5'6	... 5'6	1									
12	0'3	1'6	1'5	7'4	7'8	9'7	4'0	18'0	14	45	12	... 3'6	... 7'1	... 1'4	... 5'7	... 2'4	... 6'1	... 2'5	... 9'8	5										
13	7'4	7'4	2'3	5'5	0'6	3'2	14'6	1	20	13	... 0'6	1'5	... 0'4	1'3	... 0'8	1'8	... 1'3	... 1'3	... 1'3	... 1'3	5'6	13								
14	1'2	6'1	5'6	1'1	5'5	1'1	5'5	10'3	19	20	14	... 0'6	1'5	... 1'7	1'1	... 4'2	0'8	... 2'1	2'1	... 6'9	17									
15	0'8	4'2	4'2	5'9	5'8	5'8	4'7	15'9	15	50	15	3'3	1'4	1'7	1'1	... 4'2	0'8	... 2'1	2'1	... 6'6	6'6	22, 24								
16	6'2	4'2	4'4	6'6	3'1	7'6	5'3	7'9	?	...	16	2'5	2'5	... Calm	2'5	1'7	4'6	...	...	...	...	...	...	...	...	...
17	3'3	7'9	10'5	4'9	7'4	3'9	9'4	?	...	17	7'4	1'5	12'9	...	2'6	10'2	9'2	13'1	9							
18	6'0	9'0	3'6	8'8	3'6	8'8	3'6	8'8	17'2	18	50	18	8'5	8'8	8'8	5'7	5'7	5'7	8'5	12'5	9									
19	3'8	5'7	2'7	4'1	13'1	3'1	23'7	14	40	19	6'9	7'3	3'0	2'2	11'3	7'6	5'1	5'1	12'8	11										
20	11'1	6'5	15'7	9'1	13'6	8'4	12'5	24'8	16	55	20	1'3	6'5	0'8	3'8	6'7	6'6	9'8	14'4	22										
21	6'7	10'1	5'4	8'1	4'6	6'8	0'9	1'3	17'5	0	45	21	9'7	14'5	12'0	8'0	4'2	6'2	1'1	2'8	17'4	3								
22	4'2	4'2	8'2	2'1	5'2	13'1	21'0	21	30	22	9'2	...	9'8	...	7'9	1'4	3'3	10'8	5											
23	3'4	5'2	4'4	6'6	6'9	6'9	9'3	24'3	23	15	23	5'1	7'6	2'4	11'9	4'9	16'4	6												
24	12'1	1'9	9'6	5'7	8'5	11'8	2'8	21'1	0	10	24	1'2	5'8	3'3	7'9	5'7	8'9	10'0	10											
25	7'5	7'5	10'5	8'4	12'5	8'3	8'3	20'2	14	30	25	2'5	1'7	0'4	2'3	0'9	10'5	13'8	24											
26	4'9	7'4	4'7	7'1	9'6	6'4	7'9	5'3	16'0	10	45	26	10'9	7'3	15'1	10'4	7'0	8'0	1'6	15'1	9									
27	5'1	5'1	5'1	7'6	4'7	7'1	3'3	7'9	13'6	13	10	27	7'2	10'9	4'5	4'4	4'4	5'3	11'8	9										
28	2'1	5'2	2'3	1'8	2'7	2'4	1'0	1'6	9'7	5	45	28	4'6	1'4	2'2	0'9	1'3	0'6	1'5	4'6	2, 3									
29	...	4'3	4'6	1'3	1'3	0'9	0'9	0'9	8'2	6	55	29	Calm	1'8	2'7	...	Calm	3'3	3'3	3'3	3'3	3'3	15							
30	2'3	6'1	1'2	11'6	2'3	12'1	...	23'2	20	35	30	0'9	1'3	5'9	2'0	0'4	9'8	6'6	15'7	24										
S+N& W+E	77'3	171'4	77'2	201'6	1224	203'2	98'9	180'1	...	...	S+N& W+E	113'0	125'1	131'1	140'5	106'1	131'8	108'7	115'4	...								
S-N& W-E	-45'9	6'0	-36'6	-7'0	-31'8	-6'8	-23'1	10'9	...	...	S-N& W-E	-26'0	8'9	-31'9	-10'9	-38'5	-15'2	-29'3	-15'4	...								

ENGLAND S.W.:—SCILLY.

Height of Head above—Ground 9' 8 m., M.S.L. 49' 7 m.
Height of Cups above—Ground 5' 8 m., M.S.L. 45' 7 m.

Day.	3 h.			9 h.			15 h.			21 h.			Max. in a Gust.	Time of Gust.	Day.	3 h.			9 h.			15 h.			Max. in a Gust.	Time of Gust.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.				S.	N.	W.	E.	S.	N.	W.	E.			
I	... 1'1	5'3	4'6	No record	...	No record	...	12'3?	18	45	1	3'4	...	3'0	...	3'0	7'3	4'2	10'2	17'1	7	35		
2	No record	...	...	10'4	5'6	3'7	1'0	2'3	13'1?	6	40	2	5'7	1'1	6'0	1'2	8'1	5'4	9'5	9'5	18'6	21	0	
3	6'3	3'9	1'6	3'8	2'6	0'5	2'5	9'2	0	35	3	5'4	2'2	5'3	3'6	2'6	0'5	CaIm	3'9	8'5	12'2	0	5			
4	0'3	0'7	1'9	4'6	1'1	5'7	...	7'9	10'4	19	35	4	CaIm	...	0'8	...	3'9	2'9	4'3	15'2	7	10				
5	9'6	8'6	8'3	3'0	7'3	2'1	2'1	5'0	13'6	4	5	5	2'2	...	5'4	10'4	3'0	7'3	4'2	6'3	15'2	7	50			
6	2'1	3'2	1'9	4'6	1'1	2'7	2'1	3'2	6'0	0	30	6	4'8	2'0	4'0	2'0	4'2	0'8	2'2	0'9	9'4	5	50			
7	0'2	0'8	2'9	4'5	0'9	1'7	0'3	6'6	13'5	13	50	7	1'7	0'7												

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ .	Remarks.
				A _{N.}	A _{E.}	A _{Z.}		
2	L F	h m s	s	μ	μ	μ	km.	Slight disturbance.
		15 31	...	...	...	...	...
2	S L F	19 35 12	...	...	...	...	3900	P uncertain.
		19 39 26	...	...	...	...	...
		19 52	...	...	...	...	...
6	L F	7 32	...	...	...	...	...
		8 15	...	...	...	...	...

Note.—The prevalence of large wind effects during the month may have led to the omission of several slight disturbances.

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	0 h.		6 h.		12 h.		18 h.	
	A_{N.}	T.	A_{N.}	T.	A_{N.}	T.	A _{N.}	T.
1	μ 0·8	6	μ 0·8	6	μ 0·8	7	μ 0·9	6
2	1·5	6	1·6	7	2·1	7	1·4	7
3	1·7	7	1·5	7	1·6	7·5	1·5	7
4	1·4	7	1·4	7·5	0·8	7·5	1·0	4·5
5	1·1	4	0·8	4	0·8	5	0·5	6
6	0·9	4	0·9	4	0·8	4	0·6	4·5
7	0·8	4	0·8	4	0·7	5·5	0·5	4
8	1·1	4	2·0	4	2·0	4·5	2·3	6
9	2·7	5	1·7	5·5	2·0	5·5	1·4	5
10	1·8	5	0·9	6	0·7	6	0·6	5·5
11	0·5	4·5	0·6	4·5	0·9	4·5	...	...
12	0·9	5	0·8	6	1·0	5	0·9	5
13	1·1	5	1·8	4·5	0·9	5	1·1	4
14	0·5	6	0·9	5	0·9	4·5	0·8	5·5
15	0·8	5·5	0·8	5	1·0	4·5	1·1	4
16	...	...	...	...	0·6	4	0·5	4·5
17	0·6	5	0·9	4	0·7	5·5	1·1	4
18	1·7	6	2·2	5·5	3·1	6·5	3·1	7
19	3·9	7	4·1	7	2·8	7	2·1	6
20	2·8	7	2·7	7	3·9	7	3·1	6
21	3·1	6	2·8	6	...	...	2·3	6
22	3·1	7	3·0	5·5	2·0	6·5	1·6	6
23	2·2	6	2·3	6	2·0	7	1·5	7
24	1·7	5	1·9	5	2·9	6	2·7	6
25	2·8	5	2·6	5·5	2·2	6·5	2·4	6
26	2·5	5·5	2·4	6	2·3	6	1·9	6
27	1·6	6	1·0	5	1·0	4·5	0·7	5·5
28	0·6	5·5	0·8	4·5	0·6	5	0·3	4
29	0·6	6	0·5	5	0·5	6	0·4	6
30	0·6	7	0·6	6	1·0	6	1·2	5·5

Means for Month $\{ A_N = 1.5 \}$ Normals, 1911-18 $\{ \frac{A_N}{T} = 1.8 \}$

EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).

Day.	Times, G.M.T. of		Remarks.
	Commencement.	Max. Phase.	
2	h m	h m	
	...	15 38	Very small.
2	...	19 42	Small.
6	7 39	7 51	Very small.
18	22 3	22 II	Large disturbance. Amplitude on trace 3·7 mms. Succession of small waves to 22 h. 45 m.

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Station.	Aurora Observations.	
			Eskdalemuir.	Richmond.		Remarks.	
1	...	□	...	...	...
7	...	○	...	...	...
14	...	□	...	...	...
16	p.	...	I, I	2, I	Balta sound Deerness Wick Banff Aberdeen	18 h.-23 h. Arch moderately bright, elevation about 20°, very steady and persistent, colour greenish white.	
17	p.	...	I, I	I, I	Deerness		
20	p.	...	O, I	O, I	Deerness		
21	p.	...	I, I	I, I	Deerness		
22	...	●	...	...	...
30	...	□	...	...	...

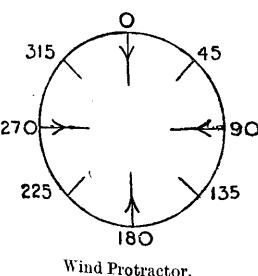
Note.—The two magnetic "characters" entered in each case refer to the two periods of 24 hours ending and beginning at midnight of the night in question.

10. SOUNDINGS WITH PILOT BALLOONS.

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.												Cloud Observations.					
		Geostrophic.		By Anemometer.		At Heights above M.S.L.								Time, G.M.T. h. m.	Type.	Deg. from N. mr/s.	Type.		
		Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.	Deg. from N.	m/s.						
ESKDALEMUIR.																			
10	12 30	45	7	25	7.5	55	10.5	60	16.0	60	19.5	...	...	...	Cu.	45	...
11	12 25	45	12	300	5.5	15	8.0	25	11.0	15	10.0	20	18.0	...	Cu.	...	...
13	8 10	60	8	360	4.0	25	8.5	50	11.5	45	6.0	...	...	...	St-Cu.	...	...
14	8 15	?	?	calm		50	4.0	105	3.2	125	2.3	...	...	...	St.	...	...
14	11 55	?	?	10	4.0	70	3.8	70	1.8	155	5.5	175	8.5	180	5.0	...	St-Cu., A-Cu.		
15	7 50	?	?	calm		35	5.5	80	5.0	95	4.9	85	2.0	...	...	...	Ci.
15	11 55	?	?	340	3.6	35	7.0	55	5.0	85	3.6	90	3.7	45	2.4	...	cloudless		
21	7 40	310	17	265	5.0	295	5.0	315	20.5	320	21.0	...	...	...	St-Cu.	320	...
26	12 15	20	14	360	7.5	10	13.0	25	11.0	15	8.0	...	...	...	Cu.	...	Ci-Cu., Ci-St.
27	7 55	?	?	20	11.5	30	18.0	45	21.5	50	6.0	...	...	...	St., St-Cu.	10 0.5	...
(For observations at lower levels, see above.)																			
14	11 55													5000 m.	235	2.9	...	Ci-St., cloudless	
15	11 55													5	5.0	
SOUTH FARNBOROUGH.																			
11	14 50	360	9	360	3.1	355	4.8	15	9.0	360	8.0	...	...	...	Cu., Cu-Nb.	...	Fr-Cu., A-Cu., cloudless
12	7 45	?	?	290	2.0	360	11.5	20	10.0	10	8.0	...	...	...	A-Cu., cloudless	...	...
12	8 8	?	?	290	0.9	5	10.5	25	8.5	5	9.0	10	19.0	...	...	...	...
13	15 50	?	?	calm		15	5.5	45	6.0	30	5.5	355	6.5	305	28.5	...	Ci-St., 180		
18	8 5	310	10	245	2.2	310	14.5	320	16.0	310	14.5	305	29.0	305	28.5	...	...
21	7 45	300	18	245	6.5	295	18.0	320	17.0	315	11.5	315	22.5	315	23.5	...	...
24	7 45	270	10	225	4.0	280	15.5	290	16.5	280	25.0	280	16.5	...	St.	135	...		
25	9 15	270	10	225	1.8	290	7.0	290	8.0	285	8.5	275	8.5	240	20.0	...	Ci., Ci-St.		
25	11 55	250	10	225	3.6	260	7.0	275	10.0	270	11.0	270	13.0	260	13.0	...	...
26	7 30	?	?	200	0.9	275	11.0	280	9.0	260	9.0	265	11.5	265	9.5	Cu., Nb.	180		
*26	10 35	(See below.)												5000 m.	6000 m.	6000 m.	6000 m.		
18	8 5	(For observations at lower levels, see above.)												310	35.0	St-Cu.	Ci-St., 180		
21	7 45													315	32.0	St-Cu.	...		
25	11 55													235	16.5	...	...
26	7 30													280	10.0	St-Cu.	180		
*26	10 35	270	6	200	0.4	250	7.0	260	6.0	265	7.0	275	9.0	270	7.0				
		5000 m.		6000 m.		7000 m.		8000 m.		9000 m.		10,000 m.		11,000 m.					
		265	8.0	265	6.5	245	15.0	245	12.0	280	7.5	285	8.0	225	6.5				
		12,000 m.		13,000 m.		14,000 m.		15,000 m.		16,000 m.		17,000 m.		18,000 m.					
		265	6.0	255	11.0	280	6.5	205	7.0	300	3.5	300	11.0	290	7.0				
		19,000 m.		20,000 m.		21,000 m.		22,000 m.		23,000 m.		24,000 m.		25,000 m.					
		250	14.0	260	11.0	255	15.5	265	22.5	245	26.0	230	16.5	285	14.5				
CAHIRCIVEEN.																			
1	7 55	90	5	125	1.1	70	11.5	50	2.5	50	9.0	40	11.0	40	12.0	...	cloudless		
1	11 45	90	7	45	8.0	65	11.5	85	10.0	...	...	35	9.0	40	15.0	...	...
2	7 30	90	6	85	7.0	90	12.5	155	3.9	70	10.0	70	10.0	...	...	Cu., Fr-Cu.	...
3	7 55	80	7	85	7.5	75	7.5	95	3.1	80	9.0	...	...	8 15	40 3.5	...	...
4	7 25	80	7	75	6.5	70	11.0	70	5.0	50	5.0	30	4.0	8 10	65	Ci.	280 2.0		
I	7 55	(For observations at lower levels, see above.)												5000 m.	6000 m.	6000 m.	6000 m.
I	11 45													20	16.0
														15	20.0	...	Cu.

Height of Station above M.S.L. = H.,
Anemometer above ground = h.

Aberdeen 14 m. 32 m.
Eskdalemuir 242 m. 15 m.
South Farnborough 70 m. 31 m.
Cahirciveen 9 m. 13 m.



Notes on Pressure Distribution.

- November 1919.
- 1st, 7 h., 13 h. Anticyclone over the British Isles, centred S. of Iceland.
 - 2nd, 7 h. Ridge from Iceland to Scandinavia, shallow Lows over the Azores region and Central Europe.
 - 4th, 7 h., 13 h., 18 h. Ridge from Iceland to Scandinavia, extensive shallow Low centred W. of Spain.
 - 5th, 7 h., 13 h. Shallow Low centred W. of Spain, wedge over Scandinavia.
 - 6th, 7 h., 18 h. from the Azores to Germany, wedge over Scandinavia.
 - 7th, 7 h., 18 h. over Central Europe, wedge over Scandinavia.
 - 8th, 7 h., 13 h. over the British Isles, " "
 - 11th, 7 h., 13 h. Anticyclone stretching from the Azores to Spitzbergen, shallow Low over the Continent.
 - 12th, 7 h., 18 h. Irregular isobars over the British Isles, anticyclone over Icelandic region.
 - 13th, 7 h., 13 h., 18 h. region.
 - 14th, 7 h., 13 h. Deep depression centred near Lisbon, anticyclone over Icelandic region.
 - 15th, 7 h., 13 h., 18 h. Deep depression centred over France.
 - 18th, 7 h. Westerly type.
 - 21st, 7 h. North-westerly type.
 - 24th, 7 h. Westerly type.
 - 25th, 7 h., 13 h. Deep depression covering the British Isles, centred N. of Scotland.
 - 26th, 7 h., 13 h. Extensive Low centred over the North Sea.
 - 27th, 7 h., 13 h. Low centred near Jersey.
 - 28th, 7 h., 18 h. Shallow Low covering the British Isles.
 - 29th, 7 h., 18 h. Low centred S. of Ireland, secondary near Portland Bill.
- Eskdalemuir—
- 11th, 12 h. 25 m. Snow lying.
 - 13th, 8 h. 10 m. Snow lying, barometer rising.
 - 14th, 8 h. 8 m. } Snow lying, barometer steady.
 - 11 h. 55 m. } 11 h. 55 m. } Snow lying, barometer steady.
 - 15th, 7 h. 50 m. } 11 h. 55 m. } " " "
- South Farnborough—
- 11th, 14 h. 50 m. Mist above, Cu-Nb. coming up quickly.
 - 26th, 10 h. 35 m. See Met. Mag., May 1920, p. 73.
- Cahirciveen—
- 1st, 11 h. 55 m. Violent updraught of 150 m/m. at about 2 km. over 1000 m. (Two-theodolite.)
 - 4th, 17 h. 5 m. Vigorous updraught of about 100 m/m. at 2.5 km. over 500 m.
 - 5th, 11 h. 55 m. Fairly quiet after surface layers past, Ci. nearly stationary.
 - 6th, 15 h. 55 m. Conditions quiet after surface layers up to 4.5 km.
 - 14th, 11 h. 50 m. Well-marked undulations of long period in height-timograph up to 6 km. Vertical currents up to 35 m/m. in some places.
 - 28th, 8 h. 25 m. Shower at start. Balloon got wet but soon got clear of rain, so that error in vertical velocity probably not large.
 - 29th, 8 h. 20 m. Fine frosty morning.
 - 29th, 16 h. 55 m. Slight haze at surface.

10. SOUNDINGS WITH PILOT BALLOONS—*continued.*

Day.	Time of Start, G.M.T. h. m.	Horizontal Velocity of Wind.												Cloud Observations.						
		Geostrophic.		By Anemometer.		At Heights above M.S.L.								Time, G.M.T.		Type.		Deg. from N.	mr/s	
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		Deg. from N.	m/s.	Deg. from N.	Type.	Deg. from N.	mr/s	
CAHIRCIVEEN— <i>continued.</i>																				
4	11 40	90	7	55	6.0	105	8.5	140	6.0	130	10.0	70	6.0	...	...	12 10	Cu.	65	...
4	17 5	90	10	40	2.5	115	2.2	85	9.0	65	4.8	50	7.0	50	9.0	...	...	...	...
5	8 5	90	4	90	3.0	65	10.0	80	14.0	70	11.5	50	6.5	...	...	...	...	...	...
5	11 55	90	10	50	7.5	60	10.5	70	13.0	45	5.5	50	4.2	5	1.5	...	...	...	...
6	7 50	50	6	55	2.5	45	8.0	70	8.0	20	7.0	...	...	...	...	8 15	St.	10 40	Ci., Ci-Cu.
6	15 55	45	5	75	3.0	50	7.5	50	6.0	30	7.0	350	2.7	255	7.5	17 10	Fr.-Cu.	360	A-Cu., A-St.	
7	7 50	50	4	55	1.5	340	4.2	350	5.5	330	7.5	...	...	...	...	...	...	...	...
7	15 55	?	?	270	0.5	305	4.1	290	4.1	280	10.5	275	12.0	16 40	St-Cu.	290	Ci-St., Ci-Cu.			
8	7 40	?	?	50	2.1	350	6.5	350	7.0	320	7.0	310	8.0	285	12.5	8 25	Cu.	360	A-Cu.	
8	12 30	?	?	75	3.5	20	4.7	345	6.5	345	7.0	305	5.5	285	7.5	...	Cu.	315	Ci-Cu.	
10	8 5	50	10	50	2.0	40	11.0	30	11.0	15	15.0	...	...	...	...	8 30	Cu.	20	A-Cu.
10	12 30	50	13	50	4.2	35	7.0	35	10.0	55	7.5	5	13.0	20	8.0	...	Cu.	45	...	
II	8 10	360	5	calm		150	7.0	130	7.0	95	5.5	70	4.8	20	3.5	...	...	...	...
II	15 15	?	?	85	2.3	...	...	130	3.9	110	3.4	105	4.1	80	3.4	16 0	...	...	...
12	8 0	?	?	...	...	...	...	275	11.0	280	11.5	295	12.0	...	...	8 30	Cu.	...	...
12	16 0	330	8	calm		35	4.1	20	7.0	350	8.0	...	...	...	...	...	Cu.	360	A-Cu.
13	7 55	360	10	50	3.8	55	11.5	40	6.0	45	8.5	360	6.0	...	...	...	St-Cu.	360	...
13	11 40	?	?	50	3.4	60	13.5	55	6.0	45	7.5	...	...	...	...	12 10	...	...	...
14	8 0	80	4	80	4.3	65	13.5	70	9.0	65	12.5	55	8.0	...	...	...	...	...	...
14	11 50	60	6	80	7.5	65	12.5	60	8.0	55	10.5	25	11.0	30	9.0	...	...	...	...
15	16 25	360	6	75	1.5	35	6.5	20	7.5	15	12.0	5	15.0	355	14.0	...	...	...	cloud less
25	8 45	300	15	5	5.0	330	11.5	330	15.5	330	18.0	...	...	...	...	9 10	Cu., St-Cu.	315	...
27	16 10	20	8	15	5.5	25	9.0	20	5.0	20	6.5	20	6.0	345	4.1	...	Cu., Fr-Cu.	20	...	
28	8 25	?	?	80	3.2	100	6.0	95	7.0	125	2.5	...	...	...	...	8 55	St-Cu.	...	A-Cu.
28	16 25	?	?	95	4.0	40	2.1	40	4.9	80	6.5	360	2.3	300	3.5	...	St-Cu.	70	False Ci.	
29	8 20	360	8	70	1.5	100	4.8	30	2.0	340	6.0	330	7.5	305	12.0	...	St-Cu.	315	...	
29	15 55	280	3	calm		310	0.5	310	1.4	290	3.5	290	6.0	300	11.5	...	A-Cu.	305	4.0	
		5000 m.		6000 m.		7000 m.		8000 m.		9000 m.		10,000 m.		11,000 m.						
5	11 55	255	14.0	...	...	270	19.5	265	27.5	...	...	...	...	...	...	...	...	...	Ci.
6	15 55	240	11.5	225	13.5	220	18.5	215	18.5	205	18.0	230	12.5	...	...	...	...	...	A-Cu., A-St.
8	12 30	270	12.5	265	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	Ci-Cu.
10	12 30	25	9.0	20	3.1	20	2.6	25	4.6	...	...	...	...	...	...	...	...	...
II	8 10	320	2.6	340	13.0	330	13.0	310	15.5	320	23.5	...	...	...	...	...	...	...	Ci-Cu., Ci-St.
II	15 15	...	...	5	9.0	...	...	...	...	...	...	...	...	...	...	...	...	...	Ci-Cu., Ci-St.
14	11 50	350	4.0	290	5.5	315	11.0	280	13.5	285	9.0	265	12.5	270	16.5	...	...	...	...
15	16 25	360	16.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		(For observations at lower levels, see above.)																		

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN.

Day and Hour G.M.T.	Type of Cloud.	Velocity-height-ratio.					Remarks.	
		Degrees from N.		Milliradians per Second.	Components.			
					W.-E.	S.-N.		
7 11	A-Cu.	268	mr/s.	mr/s.	+	1.8	High A-Cu.	
7 13	A-Cu.	268	2.0	mr/s.	+	2.0	High fused A-Cu.	
II 13	Cu.	45	6.9	mr/s.	-	4.9	Cu. to St-Cu. transitional type.	
19 13	St-Cu.	240	6.5	mr/s.	-	5.6	High type St-Cu.	
22 13	Fr-St.	299	16.0	mr/s.	+	14.0	...	
25 13	A-Cu.	320	1.0	mr/s.	+	0.7	A-Cu. of low type.	
26 13	Cu-Nb.	8	9.2	mr/s.	-	1.3	Central mass measured.	
27 13	False Ci.	50	1.8	mr/s.	-	1.4	"Anvil" of false Ci measured.	
28 13	Cu.	120	6.6	mr/s.	-	5.7	...	
29 13	Ci.	95	2.1	mr/s.	+	3.3	...	
				mr/s.	+	0.2	...	
				mr/s.	+	0.2	Ci. changing to Ci-St.	

Note.—Large amount of Nb. and diffuse cloud all month.

For Table 12, see p. 92.

METEOROLOGICAL OFFICE OBSERVATORIES—GEOPHYSICAL JOURNAL.

DAILY VALUES.—*Solar Radiation, Meteorology, Atmospheric Electricity, Terrestrial Magnetism, and Seismology.*

Ninth Year.—No. 12. DECEMBER 1919.]

Units based on the C.G.S. System.

[Price 1s.]

1. SUNSHINE AND SOLAR RADIATION.

Day.	WESTMINSTER.		SOUTH KENSINGTON.—Lat. 51° 30' N. Long. 0° 10' W.				RICHMOND.—Lat. 51° 28' N. Long. 0° 19' W.				ESKDALEMUIR.—Lat. 55° 19' N. Long. 3° 12' W.				CAHIRCIVEEN.			
	Bright Sunshine.*		Radiation received on Horizontal Surface by Callendar Radiograph.				Bright Sunshine.*		Radiation at Noon by Ångström Pyrheliometer.		Bright Sunshine.*		Radiation by Ångström Pyrheliometer.				Bright Sunshine.*	
	Total.	Per cent. of Possible.	Daily Total.	Per cent. of Planetary.	Maximum.		Total.	Per cent. of Possible.	Intensity.	Vertical Component.	Sky.	Total.	Per cent. of Possible.	Time.	Sky.	$\frac{p}{p_0}$ sec Z.	Intensity.	Total.	Per cent. of Possible.
	hr.	%	j/cm².	%	Amount.	Time.	hr.	%	mW/cm².	hr.	mW/cm².	hr.	%	h. m.	h. m.	mW/cm².	hr.	%
1	0'0	0	34	5	4	11 30	0'0	0	...	0'0	0	0'0	0	...	...	...	0'3	3
2	3'2	40	187	25	19	12 15	19	3'9	48	60	17	Clear	7	...	...	0'0	0	
3	0'0	0	70	10	8	13 15	7	0'0	...	...	...	...	1'4	18	...	...	0'1	1
4	2'7	34	143	20	19	11 50	19	2'5	31	...	...	...	0'0	0	...	...	2'1	26
5	0'0	0	14	2	3	12 5	3	0'0	0	...	...	...	0'0	0	...	...	0'0	0
6	0'4	5	108	15	18	10 50	8	0'9	11	...	...	...	0'3	4	...	...	3'7	47
7	3'1	39	212	30	16	11 55	16	4'4	55	...	...	...	6'2	79	12 3	Clear	4'65	69
8	0'0	0	136	19	16	11 35	16	3'7	47	...	...	...	6'0	77	12 4	Clear	4'76	62
9	0'0	0	120	17	8	12 10	8	7'0	89	...	...	...	0'2	3	...	...	1'7	22
10	2'2	28	224	33	18	12 45	15	2'3	29	...	...	...	0'0	0	...	...	0'0	0
11	0'0	0	47	7	5	11 50	5	0'0	0	...	...	...	0'0	0	...	...	1'9	24
12	0'0	0	59	9	3	14 5	2	0'0	0	...	...	...	0'0	0	...	...	2'4	31
13	0'0	0	48	7	3	13 0	2	0'0	0	...	...	...	0'0	0	...	...	0'1	1
14	0'0	0	68	10	10	12 14	10	0'0	0	...	...	...	3'2	42	...	...	0'0	0
15	0'0	0	68	10	4	12 10	4	0'0	0	...	...	...	0'0	0	...	...	2'6	34
16	0'0	0	93	14	10	13 40	3	0'0	0	...	...	...	0'0	0	...	...	1'2	16
17	0'4	5	183	28	14	13 5	12	0'1	1	...	...	...	0'0	0	...	...	0'0	0
18	0'0	0	99	15	12	11 5	6	0'2	2	...	...	...	0'0	0	...	...	0'2	2
19	0'8	11	167	26	13	12 10	13	0'9	12	...	...	...	3'2	42	...	...	0'0	0
20	0'0	0	100	15	14	12 30	14	0'0	0	...	...	...	0'0	0	...	...	0'0	0
21	0'0	0	43	7	15	12 40	8	0'4	5	...	...	...	0'6	8	...	...	2'1	28
22	0'3	4	106	16	8	10 5	7	0'6	8	...	...	...	0'0	0	...	...	0'0	0
23	0'0	0	99	15	10	13 55	7	0'0	0	...	...	...	0'0	0	...	...	1'0	13
24	2'1	27	217	33	15	12 20	15	3'1	40	33	9	Thro. Cl.	1'1	14	...	...	1'8	23
25	0'5	7	147	23	23	12 7	23	0'6	8	55	14	Clear	4'0	52	...	...	3'5	46
26	0'1	2	67	10	11	11 50	11	0'0	0	...	...	...	0'0	0	...	...	0'0	0
27	1'1	15	154	23	18	11 30	18	0'6	8	...	...	...	0'3	4	...	...	2'1	27
28	0'0	0	142	22	9	12 15	9	0'0	0	...	...	...	0'0	0	...	...	0'0	0
29	0'0	0	174	26	12	12 50	11	0'0	0	...	...	...	0'1	I	...	...	0'0	0
30	0'0	0	68	10	11	11 15	7	0'0	0	...	...	...	0'0	0	...	...	0'0	0
31	0'1	I	77	12	7	13 25	4	0'2	2	...	...	...	0'6	8	...	...	0'0	0
Means	0'55	7	112	16	11	—	10	0'82	13	—	—	—	0'90	12	—	—	1'03	13
Normal	0'52	7	131	19	—	—	—	1'19	16	—	—	—	0'68	10	—	—	1'32	17
	← 35 years →		← 7 years →		← 35 years →		← 35 years →		← 5 years →		← 35 years →		← 45 years →		← 45 yrs →		← 35 years →	

2. METEOROLOGY AND MAGNETISM:—CAHIRCIVEEN (VALENCIA OBSERVATORY).—Lat. 51° 56' N. Long. 10° 15' W.

Heights above M. S. L.:—H = 9'1 m. H_b = 13'7 m. H_a = 26'4 m. Above Ground: h_t = 1'3 m. h_r = 0'56 m. h_a = 13'9 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.		Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount (0–10) and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.		Magnetism.			
	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	mm.	a.			Horizontal Force, Declination West, and Inclination.			
	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	200+	200+						
1	mb.	mb.	200+	200+	8'5	8'0	87	87	185	5	235	10	8	7'3	76	Fine n. o. to c. and p. day.		
2	1005'1	998'5	79'5	78'7	82	78	13'0	88	220	2	225	5	9	1'3	76	Fine morning. o. ● ⁰ to d. day.		
3	1010'1	1007'3	78'4	84'1	x 85	78	—	—	—	—	—	—	—	—	—	o. and p. day. Fair to fine evening.		
4	1018'2	1026'4	82'9	82'1	84	82	9'0	82	235	13	260	7	3	1'0	80	Fine n. Fine to fair day.		
5	1016'9	1016'2	84'4	82'6	x 85	82	12'7	9'3	78	225	11	250	9	10	1'4	80	o. ● ⁰ to d. day.	
6	1010'0	1008'8	80'7	82'2	83	80	8'3	8'5	79	280	16	300	16	9	1'9	79	o. p. and dry a. Fine p.	
7	1021'0	1023'9	81'4	80'0	83	78	8'3	7'1	76	335	9	340	11	6	2'5	78	Fair and p. day. p. and q. evening.	
8	1026'3	1022'4	78'3	79'1	n 80	78	7'1	7'5	80	15	2	140	5	7	1'3	76	Fair a. o. and p. evening.	
9	1016'2	1009'2	80'0	79'5	82	79	9'6	9'1	94	—	1	—	1	10	1'8	77	d. n. and a. Fair to fine p.	
10	995'0	990'1	83'8	79'9	84	78	12'4	9'3	97	195	5	—	1	10	18'7	76	● morning. ● ⁰ to p. day.	
11	991'5	997'7	79'3	78'2	81	78	8'1	7'6	85	230	8	175	5	8	8'1	75	p. n. and morning. Fair day. p. evening.	
12	1004'4	1002'3	80'6	82'4	83	79	9'9	9'7	85	220	4	175	11	2	16'2	75	Fair n. Fine day. ● ² evening.	
13	1000'4	1006'6	82'4	79'3	84	79	11'1	7'8	95	82	180	5	200	4	2'7	80	● n. p. day. Fine and < evening.	
14	1000'4	991'9	83'2	80'5	84	80	11'4	8'4	92	81	175	9	220	8	4	7'7	78	o. n. p. a. p. to ● p.
15	994'2	999'4	79'5	79'9	82	76	8'2	7'6	85	170	4	280	2	7	2'7	75	Fair n. and day. Fine and W evening.	
16	1005'3	1005'6	77'2	81'2	83	n 75	7'5	10'5	92	140	3	175	8	4	10'1	73	Fine n. and morning. p. day. ● evening.	
17	1014'1	1021'7	81'1	82'0	83	81	10'0	10'0	93	270	2	225	2	10	—	79	Overscast and dull day.	
18	1019'2	1030'1	83'4	81'8	84	82	11'9	7'0	95	185	6	290	11	10	0'7	—	Fair morning. o. and d. day.	
19	1033'3	1029'9	80'3	83'7	80	9'4	12'3	92	96	205	2	250	5	8	0'6	77	Fair morning. o. and d. day.	
20	1027'9	1019'1	83'6	83'9	x 83	12'1	12'4	95	96	220	4	230	9	10	1'4	82	d. morning and day. [evening.	
21	1016'5	1019'4	81'2	81'0	84	80	9'0	7'7	84	285	13	285	14</td					

3. METEOROLOGY:—RICHMOND, SURREY (KEW OBSERVATORY).—Lat. $51^{\circ} 28' N.$ Long. $0^{\circ} 19' W.$ Heights above Mean Sea Level:—Rain-gauge Site, H = 5.5 m. Barometer, H_b = 10.4 m. Cups of Anemometer, H_a = 25 m.Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Cups of Anemometer, h_a = 20 m.

Day.	Air Pressure at Station Level.		Air Temperature in Degrees Absolute.				Humidity.		Wind—Veer from North in degrees and Speed in metres per second.		Cloud Amount and Weather.		Rain 0 h. to 24 h.	Min. Temp. on Grass.	REMARKS.			
							Vapour Pressure.	Percentage.	9 h.	21 h.	9 h.	21 h.						
	9 h.	21 h.	9 h.	21 h.	Max.	Min.	9 h.	21 h.	9 h.	21 h.	9 h.	21 h.	Tenths of Sky covered.	mm.	200+			
I	mb.	mb.	a.	a.	a.	a.	nullibar.	%	%	m/s.	m/s.	10	9	217.1	76	Dull, with ●. \equiv^0 .		
1011.1	1011.0	81.0	76.6	81	75	10.3	7.5	97	95	180	3	240	2	11.4	71	Dull, with ● to 11 h., then fine. ↗ in n.		
2	994.3	1012.5	81.7	77.0	82	77	10.3	7.0	92	87	180	10	230	3	10	11.4	Dull, with ●.	
3	1012.5	1012.5	83.7	84.1	x 85	78	11.9	12.6	93	96	230	5	230	5	10	9.9	73	
4	1017.3	1019.2	81.9	79.6	84	79	9.6	6.5	88	67	230	4	270	7	9	3.7	79	
5	1023.1	1009.8	79.0	83.1	84	78	7.7	10.3	83	84	230	4	270	6	10	3	5.9	75
6	1004.5	998.7	79.7	77.1	82	77	8.0	7.0	82	85	230	6	240	4	10	3	0.9	74
7	1004.1	1009.2	78.8	76.3	79	75	6.7	5.8	73	76	330	7	310	4	9	3	0.4	74
8	1014.0	1019.5	75.4	74.8	78	74	5.7	5.7	78	83	320	6	330	4	2	0	—	73
9	1020.7	1019.3	72.5	69.3	n 76	n 68	5.3	4.7	90	100	—	1	0	3	10	—	67	
10	1014.1	1008.1	73.5	76.2	78	n 68	5.3	5.9	83	77	330	2	170	8	5	10	n 65	Fine to showery. ↗ (gusts) p., ↗ in p.
11	1004.2	1007.9	76.3	80.2	80	75	7.4	10.0	95	99	170	7	180	2	10	10	1.1	Dull, with \equiv^0 . ● 10 h. 40 m.—16 h.
12	1011.4	1015.6	80.0	79.3	80	79	8.9	8.9	89	94	190	3	160	3	9	10	—	Dull to 9 h. 30 m., then fine.
13	1017.5	1016.8	79.7	80.0	81	79	9.2	9.0	94	90	190	2	180	5	10	10	0.1	Dull. ● d. at times.
14	1019.2	1014.4	81.5	78.7	82	79	10.6	7.9	96	86	180	4	160	6	10	10	0.2	Dull. ● d. at times.
15	1006.5	1003.3	79.4	80.0	81	79	8.8	9.7	92	97	160	4	160	4	10	10	7.4	Dull. ● d. and ● 19 h.—24 h.
16	1007.7	1014.4	79.7	74.9	81	74	9.6	7.0	98	100	250	2	—	0	10	10	2.6	\equiv^0 . Dull. ● in a. \equiv^2 at n.
17	1018.9	1019.4	72.9	81.3	82	72	6.1	10.5	100	97	—	0	220	4	10	10	71	\equiv^2 to 13 h. 30 m. Overcast in p. ● 19 h.
18	1025.2	1014.8	76.6	80.8	83	75	7.7	7.4	98	70	—	1	300	11	7	10	1.1	\equiv^0 to 9 h. 30 m. ↗ (gusts) 20 h.—21 h. ↗
19	1021.3	1026.4	79.1	76.9	83	75	6.7	6.7	71	83	280	6	300	2	2	10	—	75
20	1024.7	1019.4	79.6	82.8	84	74	9.2	11.1	95	92	250	3	240	5	10	10	0.3	Dull. ● d. in a. and 21 h.
21	1006.6	1006.6	83.1	77.7	84	76	10.7	6.1	87	71	230	8	280	9	10	10	2	Overcast to cloudy. ↗ 18 h.—22 h.
22	1011.8	998.7	77.0	83.7	84	76	6.1	10.9	76	85	270	5	270	7	2	10	—	Fine to 10 h. Overcast later. ● in p.
23	998.7	998.8	83.1	80.9	x 85	81	11.7	8.9	95	84	250	5	230	5	10	10	4	78
24	1001.7	999.1	78.8	79.7	81	79	7.1	8.0	78	82	260	6	230	4	10	10	0.5	Fine a. Fine to overcast p. ● 0 n.
25	996.6	1009.2	78.0	75.6	80	74	7.5	6.2	86	85	230	5	330	3	8	10	0.1	Fine to dull. Showers.
26	1015.8	999.5	73.1	80.8	82	73	6.0	9.9	98	94	—	1	190	7	10	10	7.0	\equiv^0 to 6 h.—9 h. 30 m. Dull.
27	999.1	1000.8	81.7	79.0	83	79	9.5	7.1	85	76	240	7	260	4	10	10	0.6	Fine to 10 h. Overcast later. ● in p.
28	1004.4	997.5	75.2	80.5	82	74	6.9	9.6	97	93	250	2	160	7	3	10	7.6	\equiv^0 to 9 h. 30 m. Dull p. \oplus p. ● n.
29	998.1	998.8	83.5	83.8	x 85	x 82	11.5	11.8	91	92	210	5	210	5	7	10	0.7	Fair to overcast. ● at n.
30	1001.2	990.6	82.6	83.3	84	x 82	10.4	11.5	88	93	220	6	200	10	9	10	6.0	Dull. ↗ (gusts). ● p. and at n.
31	983.6	994.4	79.2	76.3	83	75	8.4	6.5	89	84	230	8	260	3	10	10	1.3	● in a. Dull to cloudy. \square 21 h.
Means	1009.3	1008.6	78.9	79.0	81.9	76.1	8.4	8.3	89	87	4.4	4.8	7.9	6.4	95.1	74.3	Monthly Totals or Means.	
Normal	1012.9	1012.9	77.2	77.5	79.9	75.1	7.4	7.5	87	87	3.7	3.7	—	—	56.8	—	Normals.	
			45 years				30 years			35 years		45 years						

4. METEOROLOGY:—ESKDALEMUIR, DUMFRIESSHIRE.—Lat. $55^{\circ} 19' N.$ Long. $3^{\circ} 12' W.$ Heights above Mean Sea Level:—Rain-gauge Site, H = 242 m. Barometer, H_b = 237.3 m. Vane of Anemometer, H_a = 250 m.Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Vane of Anemometer, h_a = 15 m.

I	978.4	974.8	74.7	74.8	78	74	6.1	6.2	88	89	200	5	180	3	7	10	0.3	72	REMARKS.
2	967.7	976.6	74.6	75.0	78	74	6.3	6.8	92	97	220	6	160	4	10	10	11.7	73	\equiv^0 early; c to o \equiv^0 \oplus a and p; c, \ast ● p, \ast ● or ● \equiv^0 till 12 h.; pq p; bc to o n. \square n.
3	973.9	974.8	80.0	79.1	81	76	9.3	8.0	93	85	200	7	210	7	7	10	6.7	72	● q to c at first; op p; c, p^2 n.
4	977.4	982.1	75.6	76.6	79	74	6.2	6.7	85	85	250	8	270	10	7	2	12.6	75	\ast ● pq to c a; Δ \ast^2 p; bc, pq n.
5	982.8	974.0	77.0	77.4	81	76	7.4	6.7	92	80	210	10	270	10	10	5	12.4	74	\bullet \equiv^0 a; o to bc, pq p and n.
6	965.8	964.4	75.0	74.0	77	74	5.9	6.3	84	96	260	10	—	0	7	7	16.0	73	\bullet^2 q, \ast ● p a; c to o, \bullet^2 p; d \equiv^0 to bc n.
7	979.8	983.8	73.7	74.3	76	73	4.7	4.9	73	74	310	2	360	8	0	0	0.1	71	Cloudless all day; \square^0 n.
8	991.4	993.7	73.9	71.4	76	68	5.3	4.2	81	78	360	8	—	1	10	9	—	72	\square^0 early; very fine; \square n.
9	991.0	985.5	68.9	73.0	68	68	4.1	5.5	93	91	—	0	—	1	4	10	0.4	66	\square 7 h.; bc to o a; c p; \ast \equiv^0 n.
10	975.1	967.7	73.9	76.0	76	73	6.3	7.1	96	94	170	8	160	6	10	10	x 20.0	72	\square 1 cm., \ast \equiv^0 till 1 h.; d \equiv^0 a; \bullet^2 p and n.
11	966.2	973.6	76.9	77.1	80	76	7.4	7.5	92	91	160	7	180	5	10	8	14.0	74	\bullet \equiv^0 a; Δ 15 h.; \bullet p; Δ 19 h. n.
12	976.4	980.6	77.4	78.7	79	77	7.2	8.6	92	180	7	200	9	10	10	8.6	74	\bullet^2 \equiv^0 till 4 h.;	

5. GEOPHYSICS:—RICHMOND (KEW OBSERVATORY).

Day.	Earth Temperature at 9 h.		Height above M.S.L. of Surface of Underground Water.		Magnetic Force.						Magnetic Character of Day.	Electric Character of Day.	Charge per cc. $\times 10^{20}$. +. | -. |	Air-Earth Current. $\times 10^{16}$.	Potential Gradient, Volts per metre. Factor 2.29.							
					Horizontal Comp't.		Declination.		Inclination.													
	0.3 m.	1.2 m.	Daily Mean.	Extremes.	Mean Time.		Mean Time.	West.	Mean Time.	North.					About 15 h.	About 15 h.	3 h.	9 h.	15 h.	21 h.		
1	a. 200+	a. 200+	cm. 191	cm. 190	h m 13 3	γ 892	h m 0 23	52	h m 10 61	γ 1076	o 11	15	o 2	coulomb. ... | ...	amp/cm ² . 0.04 | 0.90	v/m. 85 | 55	v/m. -365 | -600	v/m. -880 | 420	v/m. 810 | 715			
2	76.4 77.1	80.3 80.2	191	190	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 2	2	o 2	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...
3	77.7	80.0	190	190	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	i 1	2	o 1	0.43 | 0.45	0.70 | 0.70	250 | 250	-140 | -140	295 | 295	-85 | -85
4	79.0	80.1	192	192	11 16	18405	14 23	14 40' 2	14 23	66 58' 1	i 1	1	o 2	... | ...	... | ...	170 | 170	40 | 40	z± | z±	280 | 280	
5	78.6	80.1	195	195	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	i 1	2	o 1	... | ...	... | ...	210 | 210	420 | 420	30 | 30	180 | 180
6	78.5	80.2	198	198	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 2	1	o 1	... | ...	... | ...	265 | 265	310 | 310	450 | 450	530 | 530
7	78.0	80.2	202	202	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 1	1	o 1	... | ...	... | ...	110 | 110	195 | 195	310 | 310	530 | 530
8	77.0	80.2	206	206	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	i 1	0	o 0	0.14 | 0.14	0.14 | 0.14	225 | 225	365 | 365	320 | 320	520 | 520
9	76.1	80.2	210	210	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	0	o 0	0.45 | 0.33	0.33 | 0.33	475 | 475	630 | 630	770 | 770	475 | 475
10	75.4	80.3	213	213	... | ...	... | ...	... | ...	... | ...	14 20	66 58' 9	i 1	0	o 0	0.23 | 0.21	0.21 | 0.21	755 | 755	615 | 615	— | —	350 | 350
11	75.2	79.9	215	215	11 16	18425	14 21	14 40' 2	... | ...	... | ...	o 0	0	o 0	0.27 | 0.45	0.45 | 0.45	1'05 | 1'05	— | —	225 | 225	265 | 265	
12	76.3	79.8	213	213	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	i 1	0	o 0	... | ...	... | ...	225 | 225	435 | 435	350 | 350	— | —			
13	77.1	79.7	212	212	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	i 1	0	o 0	... | ...	... | ...	170 | 170	310 | 310	320 | 320	110 | 110
14	77.9	79.7	211	211	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	2	1	o 0	... | ...	... | ...	140 | 140	195 | 195	265 | 265	240 | 240
15	78.4	79.7	210	210	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	1	o 0	0.31 | 0.43	0.70 | 0.70	225 | 225	335 | 335	— | -265	— | -265
16	78.7	79.6	209	209	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	1	o 0	0.51 | 0.23	0.25 | 0.25	125 | 125	-100 | -100	490 | 490	490 | 490
17	78.0	79.6	207	207	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	1	o 0	0.45 | 0.14	0.30 | 0.30	730 | 730	660 | 660	— | —	250 | 250
18	78.0	79.8	208	208	II 7	18410	... | ...	14 23	66 58' 1	i 1	1	o 0	0.23 | 0.21	0.21 | 0.21	180 | 180	70 | 70	505 | 505	195 | 195			
19	77.8	79.8	209	209	... | ...	... | ...	14 25	14 38' 7	... | ...	... | ...	o 0	0	o 0	0.33 | 0.14	0.14 | 0.14	140 | 140	335 | 335	240 | 240	545 | 545
20	77.0	79.8	211	211	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	i 1	0	o 0	... | ...	... | ...	475 | 475	475 | 475	210 | 210	110 | 110
21	78.5	79.7	212	212	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	2	1	o 0	... | ...	... | ...	40 | 40	70 | 70	225 | 225	225 | 225
22	78.0	79.9	211	211	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	1	o 0	... | ...	... | ...	140 | 140	450 | 450	310 | 310	250 | 250
23	78.7	79.8	211	211	11 9	18398	14 22	14 40' 6	i 2	1	o 0	0.21 | 0.57	0.57 | 0.08	0.50 | 0.50	170 | 170	15 | 15	265 | 265	335 | 335		
24	79.0	79.9	211	211	II 9	18398	14 22	14 40' 6	14 17	66 58' 1	i 2	1	o 0	0.57 | 0.08	0.08 | 0.08	110 | 110	335 | 335	280 | 280	475 | 475			
25	78.3	79.9	212	212	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	i 1	1	o 0	... | ...	... | ...	140 | 140	335 | 335	365 | 365	490 | 490
26	77.4	79.9	213	213	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	2	o 0	... | ...	... | ...	335 | 335	505 | 505	280 | 280	85 | 85
27	77.9	79.9	214	214	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	1	o 0	... | ...	... | ...	125 | 125	180 | 180	265 | 265	350 | 350
28	77.8	79.9	215	215	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	1	o 0	... | ...	... | ...	265 | 265	520 | 520	630 | 630	-125 | -125
29	78.5	79.9	216	216	o 0	0	o 0	0.23 | 0.21	0.21 | 0.21	0.85 | 0.85	125 | 125	365 | 365	390 | 390	265 | 265		
30	79.4	79.7	218	218	... | ...	... | ...	... | ...	... | ...	... | ...	... | ...	o 0	1	o 0	... | ...	... | ...	125 | 125	350 | 350	225 | 225	70 | 70
31	79.8	79.8	220	220	221	o 0	1	o 0	0.21 | 0.18	0.18 | 0.18	0.60 | 0.60	100 | 100	-210 | -210	210 | 210	575 | 575		
M.	77.8	79.9	208	208	—	—	—	—	—	—	—	—	—	—	—	206†	223†	302†	311†			
	78.4	80.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
	← 12 years →																					

† Mean for 28 days only.

6. GEOPHYSICS:—ESKDALEMUIR.

Day.	Magnetic Force.						Magnetic Character of Day.	Electric Character of Day.	Potential Gradient, Volts per metre. Factor 6.08.											
	North Component.		West Component.		Vertical Component.				3 h.		9 h.		15 h.							
	Maximum. 15000 γ +.	Minimum. 15000 γ +.	Range.	Maximum. 4000 γ +.	Minimum. 4000 γ +.	Range.	Maximum. 44000 γ +.	Minimum. 44000 γ +.	Range.	3 h.	9 h.	15 h.	21 h.							
1	h m 22 22	γ 1013	983	h m 13 3	γ 892	840	h m 0 23	γ 1076	1061	h m 8 45	15	o 0	i b 2	v/m. 175	v/m. 330	v/m. 360	v/m. 675			
2	18 30	1007	980	21 29	878	837	22 0	41	21 40	1079	1061	11 0	18	o 0	2 c 2	z—	z—	z—	510	
3	21 13	1022	957	21 35	65	21 14	892	817	22 23	75	22 14	1107	1057	11 23	50	i 1	2 b 2	295 | 295	225 | 225	260 | 260
4	0 28	1040	976	21 46	64	17 18	902	803	1 10	99	21 49	1088	1058	7 20	30	o 1	2 c 2	115 | 115	z± | z±	160 | 160
5	23 16	1021	961	11 42	60	12 59	895	808	1 44	87	23 3	1076	1057	2 26	19	o 0	2 c 2	1060 | 1060	— | —	185 | 185
6	4 56	1017	972	12 5	45	11 48	887	843	23 50	44	23 58	1073	1058	6 0	15	o 0	2 c 2	100 | 100	z+ | z+	185 | 185
7	22 43	1015	984	13 21	31	13 42	878	846	0 1	32	10 73	1058	1058	10 20	15	o 0	i b 1	200 | 200	470 | 470	695 | 695
8	21 1	1027	955	21 52	72	21 40	912	807	20 54	105	20 55	1082	1057	9 25	25	i 1	o a 1	155 | 155	185 | 185	355 | 355
9	22 5	1024	975	0 31	49	17 5	881	835	18 52	46	18 50	1078	1062	22 15	16	o 0	o a 1	175 | 175	255 | 255	315 | 315
10	7 53	1009	945	14 35	64	14 14														

7. JERSEY (ST LOUIS OBSERVATORY).—Lat. $49^{\circ} 12' N.$ Long. $2^{\circ} 6' W.$ Heights above M.S.L.:—H = 54 m. H_b = 55 m. Above Ground:—h_t = 1.48 m. h_r = 1.72 m. h_a = 8 m.

Day.	Air Pressure at Station Level.				Air Temperature in Degrees Absolute.						Min. Temp. on Grass.	Percentage of Humidity.			Rain 0 h. to 24 h.	REMARKS.	Batch Current Character.
	9 h.†	14 h.	21 h.	Mean of 3 Readings.	9 h.†	14 h.	21 h.	Max.	Min.	Mean of 5 Readings.		9 h.†	14 h.	21 h.	Mean.		
1	mb.	mb.	mb.	mb.	a.	a.	a.	a.	a.	a.	200+	%	%	%	%	mm.	1
2	1005.5	1005.5	1008.5	1006.5	81°4	80°3	81°0	82°1	79°7	80°9	76°5	98	94	89	94	214°2	● ² n. to 17 h.
3	1000.1	1006.2	1010.7	1005.7	82°6	82°7	82°3	82°8	81°3	82°3	72°0	99	71	85	85	2°9	● 9 h. 30 m. □ 21 h.
4	1013.8	1013.5	1013.9	1013.7	84°0	84°5	84°4	84°7	82°0	83°9	78°9	99	93	95	96	1°2	● 4 h. \equiv^2 6 h. 30 m. to 16 h.
5	1019.6	1019.5	1021.0	1020.1	83°2	84°3	82°8	x 84°9	81°8	83°4	79°1	95	88	74	86	1°8	● n. to 5 h. and 20 h.
6	1023.0	1018.3	1012.6	1018.0	82°9	83°6	84°1	84°1	80°5	83°0	73°9	74	82	97	84	3°4	● 16 h. continuous. [15 h. 50 m.]
7	1007.4	1001.4	1003.4	1003.4	83°0	83°5	83°7	83°7	80°5	82°4	80°9	82	76	65	74	3°7	● n. to 4 h. 30 m., 10 h., 14 h. 30 m. ▲
8	1002.6	1006.2	1007.8	1005.5	81°5	81°4	80°3	81°5	76°7	80°3	76°0	65	63	n 57	62	7°4	● ² frequent showers. 9 h.
9	1011.5	1012.9	1015.1	1013.2	78°8	79°2	78°4	80°4	76°6	78°8	73°3	64	62	62	63	—	1
10	1015.4	1014.1	1012.6	1014.0	77°2	79°2	78°2	81°0	76°7	78°5	70°9	75	66	69	70	—	1
11	999.3	1000.3	1002.7	1000.7	77°7	77°4	76°0	n 79°2	n 75°5	77°0	73°1	67	61	68	o 3	□ 4 h.	
12	1005.3	1006.6	1010.1	1007.3	79°9	80°1	79°6	80°2	79°4	79°8	78°4	92	95	97	95	1°4	● ⁰ 18 h. 30 m. to 16 h. [night]
13	1012.3	1011.7	1012.5	1012.2	79°9	80°4	80°8	81°8	77°6	80°1	76°9	94	93	98	95	o 4	● ⁰ 4 h. ● 18 h., 21 h.
14	1013.7	1010.1	1006.1	1010.0	80°0	80°2	79°0	81°1	78°8	79°6	79°4	97	89	95	94	2°7	● ² 19 h.
15	999.4	996.3	996.6	997.4	81°0	81°4	81°2	82°2	79°0	81°0	78°4	98	100	98	99	10°1	● ² 12 h. 30 m. continuous. \equiv^2 14 h.
16	1003.1	1005.3	1009.7	1006.0	80°6	83°0	79°4	83°3	79°0	81°1	77°9	97	81	94	91	2°9	● n. to 6 h.
17	1014.6	1015.3	1017.3	1015.7	79°9	81°4	81°5	82°6	78°3	80°7	70°9	81	83	98	87	o 3	● ⁰ 16 h.
18	1021.5	1020.1	1018.3	1020.0	80°7	82°5	83°3	80°0	82°0	71°1	98	92	94	95	o 1	\equiv^0 7 h. \equiv^2 to night. ● ⁰ 20 h. 30 m.	
19	1025.8	1025.4	1024.5	1025.2	82°0	82°3	82°7	83°5	81°2	82°3	76°3	64	71	83	73	—	□ 4 h. 30 m.
20	1022.7	1021.3	1019.9	1021.3	83°4	83°2	83°2	83°8	82°0	83°1	77°6	97	96	81	91	o 4	● ⁰ 4 h. \equiv^2 10 h.-16 h.
21	1010.1	1007.4	1010.6	1009.4	82°6	83°6	80°0	83°6	79°3	81°8	80°9	98	91	84	91	2°5	● ⁰ 4 h. \equiv^2 9 h.-13 h. ● ² 11 h.
22	1013.8	1011.1	1004.2	1007.7	80°0	82°3	83°1	83°3	79°5	81°6	75°2	85	88	97	90	2°9	● ² 4 h. 30 m. and 16 h. continuous.
23	1002.6	1001.0	999.8	1001.1	83°5	83°6	83°7	84°0	x 83°2	83°6	80°4	100	98	100	99	3°6	● ² night and day, with \equiv^2 8 h.-16 h.
24	1003.3	1002.7	1000.2	1002.1	81°3	83°1	81°9	83°5	80°5	82°1	76°6	78	79	82	80	3°2	● ² 4 h.-8 h. [16 h.]
25	998.9	998.7	1007.1	1001.6	81°1	79°3	80°0	82°9	78°6	80°4	77°4	73	88	64	75	7°2	● ² 9 h., 2 h. 35 m.-9 h. ● ² ▲ from 10 h.-
26	1012.1	1007.7	999.8	1006.5	80°2	81°0	82°6	83°7	77°5	81°0	n 69°3	90	98	100	96	7°3	\equiv^2 7 h. 40 m.-11 h. ● ² afterwards.
27	1001.0	999.3	998.7	999.7	82°5	83°0	82°0	83°2	81°0	82°3	76°7	97	98	98	98	7°1	● ² frequent showers.
28	1001.4	999.4	995.9	998.9	86°7	81°7	84°1	84°3	80°5	82°3	75°9	98	98	97	98	8°2	● ² 4 h., 13 h., 15 h., 18 h. \equiv^2 15 h.-16 h.
29	997.0	996.2	997.1	996.8	83°5	83°9	83°0	84°1	82°0	83°3	82°0	100	98	98	99	4°0	● ² \equiv^2 4 h. ● ² 14 h. continuous.
30	999.4	995.0	989.5	994.6	82°6	83°4	81°8	83°7	80°7	80°0	90	93	91	91	4°6	● ⁶ before noon. ● ² 15 h.	
31	991.6	994.1	992.6	992.8	80°6	81°5	80°5	82°5	80°0	81°0	77°1	68	79	80	76	1°0	● ⁰ morning showers. ▲ 9 h. 15 m.
Means	1008.3	1007.4	1007.1	1007.5	81°1	81°8	81°4	82°8	79°6	81°4	76°4	87°4	85°8	87°0	86°7	10°4	8°3
Normal	1007.5	1006.9	1007.5	1007.3	80°5	81°1	80°4	82°0	78°6	80°5	75°4	?	79°7	82°4	?	98°6	7°5
	← 26 years	→ 26 years			← 26 years	→ 26 years			← 23 years	→ 23 years	← 24 years	→ 24 years	← 26 years	→ 26 years			→ 25 years

JERSEY (ST LOUIS OBSERVATORY).

Day.	Wind Direction and Force (0-12 on the Beaufort Scale).				Mean of Force.	Cloud Amount (tenths of Sky covered), Type of Cloud, and Direction whence coming.												Mean Amount.	
	Sunshine.*			Total.		Upper.		Lower.		Upper.		Lower.		Upper.		Lower.			
	9 h.†	14 h.	21 h.	Percent. of Possible.		Tenths.	Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	Type.	Direction.	Tenths.	Type.	Direction.	
1	180° 5	315° 3	247° 4	4°0	hr.	2	10	...	Nb.	S	10	...	...	Nb.	...	6	Ci.	W	87
2	225° 7	293° 3	247° 3	4°3	1°5	18	9	...	Nb.	...	6	A.-Cu.	NW	...	8	Ci-St., A.-Cu.	...	77	
3	247° 5	247° 5	247° 5	5°0	0°0	0	10	...	...	...	10	...	...	...	10	...	...	100	
4	247° 4	247° 4	293° 5	4°8	57	4	...	...	Cu.-Nb.	W	7	...	...	Cu.-Nb.	W	4	Cu.	WNW	5°0
5	247° 3	247° 5	270° 6	4°7	0°2	2	8	...	Cu.-Nb.	WNW	8	A.-Cu.	...	...	10	...	Nb.	...	87
6	270° 5	270° 6	293° 6	5°7	0°2	2	10	...	Nb.	W	9	A.-Cu.	WNW	Cu.-Nb.	W	7	Cu.-Nb.	NW	87
7	337° 6	337° 5	337° 4	5°0	4°3	52	7	...	{ Cu. Nb.	NNE	5	...	...	Cu.	N	7	Cu.-Nb.	N	63
8	360° 4	337° 4	360° 3	3°7	6°1	73	4	...	Cu.-Nb.	N	6	A.-Cu.	NNE	Cu.-Nb.	N	6	Cu., Cu.-Nb.	NNE	53
9	45° 1	113° 2	157° 2	1°7	3°2	39	7	...	Ci.	A.-Cu.	6	A.-Cu.	SE	Cu.-Nb.	SE	9	A.-Cu.	SE	73
10	180° 5	180° 5	180° 6	5°3	2°3	27	6	...	{ Ci. Nb.	N	6	...	...	Cu.-Nb.	N	10	...	...	87
11	180° 4	157° 3	180° 3	3°0	0°0	10	8	...	Nb.	S	10	...	...	Cu.-Nb.	S	10	...	...	100
12	180° 4	225° 3	180° 2	3°0	0°0	0	8	...	Cu.-Nb.	S	10	...	...	Cu.-Nb.	S	10	...	...	93
13	203° 4	180° 3	180° 4	3°7	3°8	47	5	...	Ci., A.-Cu.	SW	10	...	...	Cu.-Nb.	SW	10	...	Nb.	83
14	180° 4	180° 4	180° 4	4°0	0°0	0	10	...	...	...	10	...	...	...	10	...	Nb.	...	100
15	157° 3	157° 3	180° 3	3°0	0°0	0	10	...	...	...	10	...	...	...	10	...	Nb.	...	100
16	315° 1	293° 1	360° 2	2°3	1°3	32	7	...	A.-Cu.	SW	7	...	...	Cu.	NW	o	...	Nb.	47
17	225° 1	203° 3	225° 3	2°3	2°3	29	7	...	Ci., Ci.-Cu.	NNW	7	A.-Cu.	NW	Cu.-Nb.	WSW	10	...	Nb.	80
18	— 0	247° 3	293° 5	2°7	0°3	4	6	...	...	...						

8. WIND COMPONENTS: Metres per second at fixed hours, together with the greatest mean hourly velocity, or the greatest velocity attained in a gust, and the time of its occurrence.

NORTH WALES:—HOLYHEAD.

Height of Head above—Roof 8·8 m., Ground 13·7 m., M.S.L. 19·2 m.
Height of Cups above—Roof 4·6 m., Ground 7·6 m., M.S.L. 15·2 m.

SCOTLAND N.:—DEERNESS.

Height of Cups above—Roof 1·6 m., Ground 4·9 m., M.S.L. 57·3 m.

Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.	Day.	3 h.				9 h.				15 h.				21 h.				Vel. in Max. Hourly Run.	Time o Max.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.	m/s.	m/s.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.	m/s.	m/s.	
1	1·1	5·5	...	1·4	3·3	...	4·7	...	3·1	9·2	?	16·5	22	55	3	11·6	...	2·3	3·8	...	9·1	...	6·0	...	9·0	...	6·2	...	9·2	...	12·1	14
2	5·7	8·5	...	2·6	12·9	...	1·7	8·7	...	3·3	...	4·9	?	9·3	...	1·9	5·7	...	3·8	...	1·8	2·7	14·4	1		
3	6·0	6·0	...	3·3	4·9	...	5·5	...	3·7	3·0	...	7·3	16·5	22	55	3	12·3	...	2·4	5·6	...	5·6	...	5·5	2·3	...	7·2	14·4	1	
4	2·1	10·6	12·5	...	3·5	17·4	...	3·3	16·7	...	27·5	13	10	4	7·6	...	3·1	8·4	...	12·5	...	2·7	13·5	15·1	15			
5	...	2·2	11·3	...	6·3	...	2·0	10·0	...	5·4	13·0	...	21·8	13	55	5	7·9	...	2·6	3·2	...	2·2	2·4	...	12·3	...	13·1	...	19, 20				
6	3·3	16·7	...	...	15·4	...	2·7	13·5	...	2·7	13·8	...	25·2	0	30	6	...	...	10·2	...	1·2	6·1	...	5·5	...	1·1	7·9	...	3·3	12·1	4		
7	10·6	4·4	...	...	13·0	5·4	...	11·1	7·5	...	11·8	4·9	18·9	19	0	7	...	9·6	6·4	...	13·7	5·7	...	9·5	...	...	10·8	...	14·8	9			
8	...	11·6	...	2·3	...	9·7	...	4·0	...	6·9	...	2·9	1·9	15·9	1	15	8	...	9·2	8·2	4·2	...	0·8	...	1·9	1·3	...	12·1	2				
9	1·6	4·2	...	0·8	...	5·9	7·4	...	1·5	15·7	23	10	9	1·6	4·8	...	2·0	6·9	...	2·9	...	10·8	23				
10	10·9	...	2·2	...	11·9	2·4	...	11·5	13·8	...	2·7	25·0	?	...	10	10·3	...	2·0	11·9	...	2·4	13·5	...	2·7	12·6	...	2·5	...	15·1	13					
11	5·1	1·0	...	6·9	...	2·9	...	4·4	...	4·4	...	7·5	...	?	17·0	11	50	11	9·0	...	1·8	4·8	...	2·0	...	8·5	...	3·5	13·1	...	14·1	22					
12	4·8	2·0	...	4·0	...	4·0	...	4·9	...	3·3	...	6·1	...	14·0	23	45	12	10·3	...	4·3	7·4	...	1·5	7·9	...	7·5	...	...	11·1	...	3				
13	9·2	10·2	12·5	5·4	...	8·1	...	22·2	19	30	13	10·0	...	2·0	13·5	...	2·7	9·7	...	4·0	10·9	...	7·3	...	15·7	24					
14	2·6	3·8	...	9·6	...	1·9	8·3	...	1·7	10·3	...	4·3	20·0	23	35	14	8·2	...	...	8·9	...	...	13·4	...	9·0	10·7	...	10·7	...	16·1	15		
15	10·3	...	2·0	2·6	...	0·5	...	Calm	...	1·1	...	...	1·1	18·8	2	15	15	12·0	...	12·0	13·0	...	9·8	...	6·6	7·6	...	5·1	...	18·4	9				
16	3·3	1·4	...	1·3	...	0·9	...	1·4	...	2·2	...	6·4	...	12·2	23	5	16	10·6	...	7·1	8·3	...	1·7	2·6	...	0·5	8·0	...	1·6	...	14·1	2					
17	7·9	...	3·3	3·4	...	5·2	...	1·0	...	5·1	...	7·1	...	14·3	4	10	17	12·4	...	5·1	7·4	...	1·5	7·9	...	7·5	...	...	14·4	5					
18	...	3·3	...	4·7	...	3·1	...	6·7	...	6·8	16·4	...	30·3	17	0	18	...	9·8	...	5·5	3·7	...	13·5	...	2·7	2·9	...	14·5	...	21·3	24						
19	7·7	18·5	...	11·6	...	2·1	...	1·3	6·8	...	2·9	...	4·3	27·1	2	5	19	3·6	18·3	...	9·0	9·0	...	1·5	7·7	...	7·5	...	...	21·6	1				
20	2·1	10·6	...	...	6·6	...	2·1	...	5·2	...	4·4	...	6·6	15·9	3	40	20	2·2	...	10·9	...	2·0	10·3	...	8·9	...	2·4	5·7	...	12·1	2				
21	4·6	...	6·8	...	7·2	7·2	...	3·8	18·9	...	9·7	14·5	...	28·5	14	25	21	0·6	...	2·9	...	1·7	8·3	...	0·6	3·2	...	1·2	5·8	...	8·5	9					
22	7·2	17·3	2·2	11·3	...	6·2	...	9·2	...	2·3	11·6	...	25·8	0	5	22	...	1·3	6·8	...	5·3	7·9	...	1·0	5·1	...	4·1	10·0	...	11·1	8				
S+N & W+E	141·0	193·0	151·0	192·5	144·0	179·3	149·5	192·7									S+N & W+E	188·3	147·2	196·0	145·9	172·0	137·7	187·6	159·7												
S-N & W-E	44·2	181·2	7·8	180·7	53·6	149·5	55·5	173·9									S-N & W-E	121·9	19·0	85·2	24·9	93·6	24·1	90·9	32·1												

ENGLAND S.W.:—SCILLY.

Height of Head above—Ground 9·8 m., M.S.L. 49·7 m.
Height of Cups above—Ground 5·8 m., M.S.L. 45·7 m.

ENGLAND E.:—SHOEBURYNESS.*

Height of Head above—Ground 27·4 m., M.S.L. 31·4 m.

Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.	Day.	3 h.				9 h.				15 h.				21 h.				Max. in a Gust.	Time of Gust.
	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.	m/s.	m/s.	S.	N.	W.	E.	S.	N.	W.	E.	S.	N.	W.	E.	m/s.	m/s.	m/s.	m/s.	
1	...	1·3	3·1	3·3	...	3·2	—	4·8	...	3·2	...	7·7	...	16·2	22	15	1	7·7	...	1·5	...	8·3	...	1·7	...	5·4	...	1·1	4·9	...	14·3	5	
2	8·0	...	5·3	6·5	9·7	...	2·2	...	5·4	10·8	...	22·6	4	35	2	9·2	...	1·8	...	16·5	...	1·4	...	6·9	...	4·3	32·4	45			
3	1·8	9·0	...	3·7	...	8·9	12·5	13·8	...	15·0	19	20	3	4·8	...	3·2	...	8·6	...	8·6	...	4·2	...	6·3	...	2·3	5·6	...	14·9	11		
4	...	10·8	...	2·1	...	10·6	16·3	...	6·0	9·0	...	18·2	15	50	4	1·4	6·9	...	2·8	...	6·7	...	3·1	7·6	...	2·1	10·8	...	29·0	17					
5	...	8·3	...	3·8	...	9·2	...	...	16·7	...	2·7	13·5	...	18·6	15	5	5	...	8·5	...	2·9	...	7·0	...	8·2	...	1·8	8·9	...	16·8	17				
6	2·4	12·3	...	No re cor d	...	7·2	17·4	...	...	8·8	21·2	...	29·0	22	45	6	1·5	7·5	...	1·4	7·2	...	7·9	...	7·9	...	2·1	10	...	21·0	16				
7	15·3	15·3	...	16·2	6·7	...	12·3	5·1	...	13·9	5·7	...	29·1	0	5	7	1·1	5·4	...	11·6	4·8	...	5·2	5·2	...	6·6	...	6·6	...	21·9	8						
8	...	13·9	2·8	8·3	...	6·6	1·3	...	2·5	20·6	0	55	8	...	9·1	3·8	...	7·6	3·1	...	7·9	3·3	...	4·1	2·7	...	19·5	10					
9	...	1·1	2·7	...	3·7	0·7	...	6·2	...	1·2	10·0	...	4·1	14·5	23	40	9	...	4·6	3·1																	

9. SEISMOLOGICAL DIARY.

EARTHQUAKES:—ESKDALEMUIR.

Day.	Phase.	Time, G.M.T.	Period.	Amplitudes.			Δ .	Remarks.
				A_N	A_E	A_Z		
9	L F	h m s 21 7 21 18	s	μ	μ	μ	km.	
12	O N 28 to O 40	...	...	...	...	...	...	Slight disturbance; no recognisable phases.
14	2 30	...	...	...	...	...	...	Moderate disturbance, but unreadable, owing to wind effects and large microseisms.
16	12 30 to 12 44	...	...	...	...	...	...	Slight disturbance, obscured by microseisms.
20	20 12 to 23	...	...	...	...	...	...	Considerable disturbance, obscured by large microseisms.
22	L M _n M _e F	23 49 59 23 52 57 23 52 58 24 22	...	...	...	...	...

MICROSEISMS OF N. COMPONENT:—ESKDALEMUIR.

Day.	0 h.		6 h.		12 h.		18 h.	
	A_N	T.	A_N	T.	A_N	T.	A_N	T.
1	μ	s	μ	s	μ	s	μ	s
2	1'6	6	1'8	8	2'5	8	1'8	6
3	1'8	6'5	1'8	6'5	1'7	6	1'2	6
4	1'4	6	1'3	5	1'6	6	2'1	5'5
5	1'9	8	2'3	6'5	1'3	6'5	3'7	7'5
6	3'1	7	3'1	7	...	...	...	...
7	3'5	7	3'5	8	4'7	8'5	...	...
8	3'9	7	3'1	6	2'1	7	1'8	6
9	2'1	4'5	2'3	4	1'6	4	1'4	7'5
10	3'0	8	1'7	7	1'3	5'5	1'1	5
11	1'3	7	1'4	6'5	1'8	5	1'8	5
12	2'1	5'5	2'3	6	2'6	5'5	2'3	6
13	2'6	6'5	2'5	6	2'2	6'5	2'2	6'5
14	2'6	8	4'4	8'5	3'9	8	4'3	9
15	3'0	9	3'2	8	2'9	7	2'7	6
16	3'7	5	3'2	6	2'9	6'5	2'3	6
17	3'2	6	3'2	6'5	3'1	6	3'4	5'5
18	3'5	7'5	4'5	7	3'5	8'5	6'2	8
19	9'9	7'5	7'8	7'5	4'1	8'5	4'9	7'5
20	3'3	8	3'2	8	3'9	7'5	3'7	8
21	3'7	8	3'9	8	3'2	8	4'2	8
22	5'1	8	3'9	8	3'5	7	3'3	6'5
23	...	...	2'5	7	2'1	8	2'4	6'5
24	1'9	8	2'5	8'5	3'4	7	2'6	6
25	3'6	6'5	3'9	6	2'9	5	2'0	6
26	2'3	6	1'7	5'5	1'9	5'5	1'6	6
27	3'3	6	5'0	5	5'7	6'5	6'6	7
28	6'6	7	8'2	6'5	6'6	6	4'1	6
29	3'8	6	4'5	5'5	2'8	6	2'8	5'5
30	2'2	6'5	1'9	6	2'6	5'5	1'6	6
31	1'7	5'5	1'6	5'5	1'5	5	1'0	6'5

Means for Month $\{ A_N = 3'0 \mu \cdot T = 6'6 \text{ s} \}$. Normals, 1911-18 $\{ A_N = 2'1 \mu \cdot T = 5'8 \text{ s} \}$.

EARTHQUAKES:—RICHMOND (KEW OBSERVATORY).

Day.	Times, G.M.T. of		Remarks.
	Commencement.	Max. Phase.	
9	h m ...	19 28	Small.
14	...	2 44	Very small.
16	...	12 40	Very small.
20	20 18	20 29	{ Amplitude on trace 1'1 mm. Succession of very small waves to 21 h. 18 m.
20	21 18	21 32	{ Large disturbance. Amplitude on trace 3'9 mms. Succession of small waves to 22 h. 46 m.
22	...	23 53	Small.

10. SOUNDINGS WITH PILOT BALLOONS.

Day.	Time of Start, G.M.T.	Horizontal Velocity of Wind.												Cloud Observations.							
		Geostrophic.		By Anemometer.		At Heights above M.S.L.								Type.		Type.					
		Deg. from N.	m/s.	Deg. from N.	m/s.	500 m.		1000 m.		2000 m.		3000 m.		4000 m.		Time, G.M.T.	h. m.	Deg. from N.	m/s.	Type.	
h. m.		Deg. from N.		Deg. from N.		Deg. from N.		Deg. from N.		Deg. from N.		Deg. from N.		Deg. from N.		Deg. from N.		Deg. from N.			
ESKDALEMUIR.																					
8	8 10	360	15	360	10.0	355	15.0	10	20.5	10	16.0	...	...	...	...	Cu.	360	...	...
8	12 0	10	9	360	9.0	10	14.0	25	15.0	20	9.5	...	...	...	...	Cu.	360	...	...
9	8 10	?	?	calm	9.0	235	0.7	240	2.7	230	4.4	330	6.0	335	20.5	A-Cu.	360	...	Ci-St.		
9	12 0	?	?	calm	2.7	200	2.7	205	5.5	240	6.5	...	...	...	...	St-Cu.	240	...	...
14	12 15	190	15	170	5.5	190	8.5	200	14.0	190	19.0	...	...	...	...	St-Cu.	195	...	Ci-St.
5000 m.																					
9	8 10	(For observations at lower levels, see above.)												330	20.0	...	A-Cu.	360	...	Ci-St.	
SOUTH FARNBOROUGH.																					
2	10 50	280	15	270	11.5	305	22.5	295	23.5	280	26.5	...	...	...	...	Fr-Cu.	...	...	...
2	12 15	280	15	270	6.5	275	12.5	285	19.0	280	22.0	...	...	...	...	Cu.; Fr-Cu.	...	...	...
6	8 0	280	20	225	6.5	270	17.5	285	26.5	285	20.0	...	...	...	...	Fr-Cu.	...	...	Ci.; Ci-St.
8	7 45	360	20	335	6.5	345	19.0	360	18.5	360	20.0	355	21.5	360	21.5	St-Cu.	...	...	...
9	8 0	340	4	calm	...	10	7.0	15	6.0	355	8.0	335	10.5	360	15.0	...	...	...	Ci.
9	12 45	?	?	calm	...	10	1.8	345	3.3	350	3.5	355	5.5	...	...	...	...	...	Ci.; Ci-St.
10	7 55	210	24	155	3.0	180	15.5	190	12.5	185	4.8	300	7.0	...	...	...	...	...	Ci-Cu.
17	9 20	?	?	200	0.5	255	8.5	265	8.0	255	7.5	305	10.5	290	8.5	A-Cu.	...	...	Ci.; Ci-Cu.
18	7 50	260	7	calm	...	230	2.4	250	6.5	310	2.0	260	8.5	285	12.5	A-Cu.	...	...	Ci-Cu.
22	7 55	300	20	245	7.5	295	15.0	305	24.5	310	25.5	...	...	...	...	A-St.	...	...	Ci-St.
22	8 30	300	20	245	6.0	290	17.0	310	26.0	320	24.5	...	...	...	...	A-St.	...	...	Ci-Cu.; Ci-St.
23	14 40	290	15	220	6.5	285	16.0	285	22.5	275	26.5	...	...	...	...	{ Cu.; St-Cu.	...	...	Ci.; Ci-Cu.
24	7 50	280	16	245	6.5	280	18.0	290	24.0	295	16.5	295	26.5	...	...	...	...	...	...
24	8 45	280	16	245	7.5	280	16.0	295	23.0	295	22.5	...	...	...	...	...	...	...	...
29	11 25	240	12	200	7.0	220	12.0	255	15.5	245	21.5	245	28.5	...	...	...	...	...	Ci-St.
29	12 25	240	12	200	7.5	250	12.5	245	15.0	245	19.0	245	24.0	...	...	Fr-Nb.	...	...	Ci-St.
5000 m.																					
6000 m.																					
17	9 20	(For observations at lower levels, see above.)												330	11.0	320	18.5	...	A-Cu.	...	Ci.; Ci-Cu.
CAHIRCIVEEN.																					
2	8 30	290	13	245	1.6	270	9.0	270	12.0	275	18.5	285	18.5	...	...	St-Cu.	315	...	Ci-St.
8	12 0	?	?	165	1.8	360	3.2	355	4.5	350	5.0	330	17.0	12 45	...	Cu.	315	...	Ci-St.		
9	9 5	220	12	calm	...	335	6.0	320	8.5	220	11.0	...	...	...	...	St-Cu.	180	...	A-St.
11	15 45	220	21	170	4.7	225	8.5	225	9.0	220	14.0	225	13.0	225	18.0	St-Cu.	225	...	...
12	15 35	230	24	190	8.5	205	12.0	200	22.0	230	14.5	235	14.0	...	...	St.	200	...	{ A-Cu.
16	8 30	?	?	calm	...	205	8.5	210	9.5	220	11.5	...	...	...	...	Cu.; Fr-Cu.	225	...	Ci-Cu.
31	8 45	320	18	295	5.5	300	8.0	300	10.0	310	13.5	300	12.0	...	...	Cu.; A-Cu.	290	...	...
Notes on Pressure Distribution.																					
December 1919.																					
During the whole month there was a permanent anticyclone over the Azores region.																					
2nd, 7 h., 13 h. Low centered S. of Iceland.																					
6th, 7 h. Extensive Low, having centres over the Shetlands and Cattegat.																					
8th, 7 h., 13 h. Northerly type.																					
9th, 7 h., 13 h. Wedge over the British Isles, centered over the Azores.																					
10th, 7 h. Low centered S. of Iceland, wedge over Scandinavia centered over the Azores.																					
12th, 18 h. Low centered S.W. of Iceland,																					
14th, 13 h. Southerly type.																					
16th, 7 h. Low centered W. of Iceland,																					
17th, 7 h. Low centered W. of Iceland,																					
18th, 7 h. Low centered N. of Iceland, ridge from the Azores to Central Europe.																					
22nd, 7 h. Well-established anticyclone entered S. of Ireland, Low centered over the Skager Rak.																					
23rd, 13 h. Trough across the British Isles.																					
24th, 7 h. Low centered N. of Scotland, High over the Baltic.																					
29th, 13 h. Low centered N. of Scotland, High over the Baltic.																					
31st, 7 h. Deep depression centered over the British Isles and the Baltic.																					
Wind Protractor.																					

11. NEPHOSCOPE OBSERVATIONS.

ABERDEEN.

Day and Hour. G.M.T.	Type of Cloud.	Velocity-height-ratio.				Remarks.	
		Degrees from N.	Milliradians per Second.	Components.			
				W.-E.	S.-N.		
4 13 6 13 8 13 12 13 19 13	False Ci. St-Cu. Cu-Nb. A-Cu. St-Cu.	273	mr/s. 2'5	mr/s. +2'5	mr/s. -0'1	Coarse false Ci. to thin A-Cu. Low type of cloud—apex measured. A-Cu. of low type. Diffuse St-Cu.	
		315	2'7	+1'9	-1'9		
		3	7'4	-7'4	-0'4		
		220	4'2	+2'7	+3'2		
		315	10'0	+7'1	-7'1		
22 13 23 13 24 12 26 13 29 13	False Ci. " " Ci-Cu. Cu. St-Cu.	300	9'4	+8'1	-4'7	Heavy masses of false Ci. Heavy sheets mixed with fine threads. Fine sheets of Ci. to partial Ci-Cu. Really St-Cu. —low altitude. Lenticular St-Cu. sheets.	
		282	5'4	+5'3	-1'1		
		287	3'0	+2'9	-0'9		
		180	6'9	0'0	+6'9		
		245	3'0	+2'7	+1'3		

Note.—Large amount of Nb. cloud all month.

12. AURORA.

Day.	a.m. or p.m.	Moon.	Magnetic Character.		Aurora Observations.	
			Eskdalemuir.	Richmond.	Station.	Remarks.
7	...	○	...	...	Gordon Castle	
7	p.	...	o, i	o, i	Paisley	
12	...	...	...	...	Deerness	
14	...	¶	...	...	Deerness	
14	p.	...	i, 2	2, 2	Seskin (Carrick-on-Suir)	
15	p.	...	i, o	2, o	Valencia Observatory	Faint.
18	p.	...	i, i	i, i	Baltasound	20 h.-21 h.; rather faint.
19	p.	...	i, i	i, i	Deerness	
21	p.	...	i, i	i, 2	Eskdalemuir	Slight glow.
22	...	●	...	...	Baltasound	
22	p.	...	i, i	2, i	Deerness	
23	p.	...	i, i	i, 2	Deerness	
25	p.	...	i, o	i, o	Deerness	
30	...	¶	...	...	Oxford	
30	a.	...	o, o	o, o	...	o h. 30 m.-1 h.

Note.—The two magnetic "characters" given in each case refer to the two periods of 24 hours ending and beginning at midnight of the night in question.

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Upper Air Temperatures.

(a) Soundings with Registering Balloons.

There are seven soundings to be recorded for the year 1919. These ascents were made from Benson, Oxfordshire. The station is close to the River Thames and at the foot of the Chiltern Hills.

(b) Aeroplane Ascents.

Temperatures recorded at South Farnborough.—The observations utilised in preparing the Tables on pp. 106 and 107 were made in aeroplanes by the Experimental Pilots of the Royal Aircraft Establishment and reported to the Branch Meteorological Office at South Farnborough.

Temperature is measured with an open scale "spiral bulb" spirit thermometer, mounted on wood, with a bright brass screen shielding the front of the bulb from direct radiation. The thermometer, which is mounted so as to ensure good ventilation, is supported on a wing strut about 6 ft. from the body of the machine. Temperature observations are made when the aeroplane is climbing or flying level to minimise the error due to temperature-lag, which would be serious in a rapid descent.

The data supplied to the Meteorological Office are actual temperatures in degrees Centigrade and corresponding altimeter readings in feet. Surface temperature at the time of ascent is usually noted by the observer, but in a few instances screen thermograph readings have been utilised.

The altimeters used are provided with what has been called the Trade Scale,* i.e. they are designed to be accurate in an atmosphere with the uniform temperature 283 a. Corrections are applied to the altimeter readings on account of the divergence of air temperatures aloft from 283 a. It may be noted here that in the altimeters which were in use in previous years the zero of the scale was fixed so that a definite isobaric surface corresponded with a definite nominal height, the index pointing to zero of the scale when the pressure was equal to 29.90 in. of mercury. It was therefore necessary to correct altimeter readings both for zero-setting and air-temperature. The practice was changed at the beginning of 1919, and in the ascents here tabulated the altimeter was set with ground level as zero. Corrections have been applied for temperature deviations and for the height of the starting point above sea-level.

The heights of the levels at which readings have been reported are corrected and the temperatures are plotted against these corrected heights. Temperatures corresponding with steps of half a kilometre are then obtained by interpolation from a smooth curve through the plotted points. All temperatures are given to the nearest half degree.

The monthly averages for the various heights have been set out in a separate table. It should be noted, however, that owing to the insufficient number of observations the averages are not as satisfactory as the corresponding data for the year 1918. The yearly averages which are the means of the values tabulated for the several months have been quoted at the bottom of the table. The total number of observations at any level throughout the whole year is also given. The mean surface temperature at South Farnborough for each month, as published in *The Monthly Weather Report*, is quoted in the table for comparison with the mean of the surface temperatures at the times of ascent. As might be expected, the aeroplane ascents being in the day time, the temperature at the time of ascent was generally above the mean for the day at ground level.

A new feature of the temperature table is the additional information regarding surface pressure and geostrophic wind velocity estimated from *The Daily Weather Report* for the hour which is nearest to the time of ascent.

It may be useful to students of the tables to know that maps showing the distribution of wind at certain levels are printed in *The Daily Weather Report*, Section B.

* See M.O., 228, "The Estimation of Height from Readings of an Altimeter."

Upper Air Temperatures.

SOUNDINGS WITH REGISTERING BALLOONS, 1919.

BENSON.—Lat. $51^{\circ} 37' N.$ Long. $1^{\circ} 7' W.$

Height above Mean Sea Level:—57 m.

T = Temperature in Degrees Absolute above 200 a. P = Pressure in millibars. H = Height in kilometres above M.S.L.

No.	340.	343.	344.	345.	346.	347.	348.	No.	340.	343.	344.	345.	346.	347.	348.
Day.	Jan. 6.	Mar. 20.	Apr. 3.	Apr. 22.	May 5.	July 3.	July 8.	Day.	Jan. 6.	Mar. 20.	Apr. 3.	Apr. 22.	May 5.	July 3.	July 8.
Start G.M.T.															
H _t = Greatest Height	8'0 km.	9'2 km.	10'7 km.	10'3 km.	14'0 km.	18'5 km.	11'4 km.	P _t = Corresponding Pressure	327 mb.	280 mb.	236 mb.	265 mb.	144 mb.	75 mb.	220 mb.
T _t = Corresponding Temp.	228 a.	221 a.	224 a.	227 a.	216 a.	229 a.	222 a.	Place of Fall	Dagnall, Berk- hamsted	Ciren- cester, Glos.	Ports- mouth Dockyard	Sparsholt, Win- chester	Banbury	Benfleet, Essex	Reading
P _t = Corresponding Pressure	327 mb.	280 mb.	236 mb.	265 mb.	144 mb.	75 mb.	220 mb.	Millibars.	km.	a.	km.	a.	km.	a.	km.
Distance	46 km.	62 km.	90 km.	64 km.	52 km.	151 km.	21 km.	100	—	—	—	—	—	—	16'56
Bearing	60°	280°	180°	210°	340°	100°	160°	200	—	—	—	—	—	—	28
Geostrophic Wind— Time G.M.T.	13 h.	18 h.	18 h.	7 h.	18 h.	18 h.	18 h.	300	—	—	—	—	—	—	—
Speed	13 m/s.	?	?	?	8 m/s.	11 m/s.	6 m/s.	400	6'65	30	6'83	35	7'12	40	7'30
Deg. from N.	230°	?	?	?	150°	270°	360°	500	5'12	40	5'25	46	5'54	50	5'73
Wind (Anemometer)— Speed	4'0 m/s.	3'0 m/s.	1'0 m/s.	Calm	5'5 m/s.	3'0 m/s.	3'0 m/s.	600	3'81	50	3'92	54	4'16	59	4'36
Deg. from North	225°	150°	350°	...	100°	300°	45°	700	2'66	60	2'75	62	2'98	64	3'16
Tropopause Type * . . . . .	...	...	I.	...	I.	I.	I.	800	1'63	65	1'72	67	1'94	66	2'10
H _c = Height . . . . .	...	...	10'5 km.	...	12'6 km.	10'0 km.	11'0 km.	900	0'71	70	0'78	71	1'12	74	1'15
P _c = Pressure . . . . .	...	...	224 mb.	...	181 mb.	266 mb.	230 mb.	1000	—	—	—	—	—	—	80
T _c = Temp. . . . .	...	...	224 a.	...	210 a.	227 a.	220 a.	Kilometres.	mb.	a.	mb.	a.	mb.	a.	mb.
(P _g) Pressure at 9 km. . . . .	...	288 mb.	303 mb.	317 mb.	314 mb.	308 mb.	315 mb.	18'0	—	—	—	—	—	—	28
(P _g) Pressure at M.S.L.	983 mb.	993 mb.	1019 mb.	1035 mb.	1014 mb.	1011 mb.	1018 mb.	17'0	—	—	—	—	—	—	27
(T _m) Mean Temp. 1 to 9 km. . . . .	...	247 a.	252 a.	258 a.	260 a.	256 a.	260 a.	16'0	—	—	—	—	—	—	26
NOTES.															
340. Isothermal at 264 a. from 1'7 to 2'0 km. Wind S.S.W., irregular up to 1 km. Barometer very low for two preceding days. Screen temperature 277 a. <i>Pressure Distribution.</i> (13 h.) Depression over the North Sea and over Valencia.															
343. Snow and rain in the morning, rain all day on the 19th. Light E. wind. Balloon lost in cloud in two minutes. Screen temperature 274 a. <i>Pressure Distribution.</i> (18 h.) Shallow "low" centered near Brest.															
344. Inversion 261 a. to 264 a. of 3 a. at 2'6 km. on one trace and 2'7 on the other. Light N. wind, overcast after clear, sunny day, clouds at 2'2 km. Balloon last seen 11th min. S.E. by S. Screen temperature 282 a. <i>Pressure Distribution.</i> (18 h.) The Azores anticyclone covering the British Isles.															
345. Inversion 252 a. at 5'9 km. to 254 a. at 6'2 km. Calm. N.E. wind backed to N.W. at 3'5 km. Low cloud in places. Overcast with high cloud. Barometer high, but falling. Screen temperature 282 a. <i>Pressure Distribution.</i> (7 h.) Anticyclone over the British Isles, centered over England.															
346. Isothermal at 270 a. 3'1 to 3'5 km. Wind E.S.E. Clear afternoon, sudden development of Cu. at 17 h. 30 m., turning to St. at 18 h. 0 m. Screen temperature 288'5 a. <i>Pressure Distribution.</i> (18 h.) "Low" centered W. of Ireland. Extensive anticyclone centered over Finland.															
347. Overcast, with Cu. shower at 18 h. Balloon lost in seven minutes going E.S.E. Wind irregular. Humidity 8% per cent. Screen temperature 286 a. <i>Pressure Distribution.</i> (18 h.) Shallow "low" centered over England.															
348. Inversion 280 a. to 283 a. from 0'9 to 1'2 km. Clear after cloudy day. Light N. wind. Humidity 75 per cent. Screen temperature 289'5 a. <i>Pressure Distribution.</i> (18 h.) Extensive Atlantic anticyclone covering the British Isles.															

HEIGHTS AND TEMPERATURES CORRESPONDING WITH ISOBARIC SURFACES.

PRESSURE.	H.	T.	H.	T.	H.	T.	H.	T.	H.	T.	H.	T.	H.	T.	T.
Millibars.	km.	a.	km.	a.	km.	a.	km.	a.	km.	a.	km.	a.	km.	a.	km.
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
300	—	—	8'76	23	9'09	27	9'38	32	9'31	31	9'17	30	9'33	30	—
400	6'65	30	6'83	35	7'12	40	7'37	47	7'30	46	7'18	42	7'32	46	—
500	5'12	40	5'25	46	5'54	50	5'73	53	5'65	57	5'57	53	5'69	56	—
600	3'81	50	3'92	54	4'16	59	4'36	62	4'24	66	4'20	61	4'30	65	—
700	2'66	60	2'75	62	2'98	64	3'16	69	3'03	70	3'00	68	3'08	73	—
800	1'63	65	1'72	67	1'94	66	2'10	72	1'96	77	1'94	76	1'99	79	—
900	0'71	70	0'78	71	1'12	74	1'15	77	1'00	84	0'98	82	1'03	81	—
1000	—	—	—	—	0'16	82	0'29	80	0'12	89	0'10	86	0'15	86	—

PRESSURES AND TEMPERATURES AT GIVEN HEIGHTS.

HEIGHTS.	P.	T.	P.	T.	P.	T.	P.	T.	P.	T.	P.	T.	P.	T.	T.
Kilometres.	mb.	a.	mb.	a.	mb.	a.	mb.	a.	mb.	a.	mb.	a.	mb.	a.	mb.
18'0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17'0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16'0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15'0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14'0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13'0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12'0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11'0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10'0	—	—	289	22	304	28	317	35	313	34	307	31	315	33	—
9'0	—	—	327	28	336	29	352	34	366	43	362	42	355	37	364
8'0	—	—	380	29	389	34	407	41	421	49	416	48	410	43	418
7'0	—	—	440	34	450	42	468	48	482	53	476	55	471	49	479
6'0	—	—	509	41	517	47	536	54	551	59	544	60	539	56	547
5'0	—	—	585	49	592	54	612	60	628	64	619	67	615	62	623
4'0	—	—	669	57	677	60	697	64	714	69	703	70	700	68	707
3'0	—	—	715	61	724	63	744	62	760	71	749	73	746	72	752
2'0	—	—	763	64	771	66	794	65	809	73	797	76	794	75	800
1'5	—	—	814	65	822	68	846	70	862	75	847	80	844	79	850
1'0	—	—	868	69	876	70	901	75	917	77	906	84	897	81	904
0'5	—	—	924	73	933	72	958	79	975	80	956	86	953	83	960
G. L. 0'06	—	—	976	76	986	74	1011	82	1028	82	1007	89	1005	86	1012

LAPSE RATE OF TEMPERATURE BETWEEN GIVEN HEIGHTS.

Degrees Absolute per kilometre.

17 to 18'	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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Upper Air Temperatures—Aeroplane Ascents, 1919.

SOUTH FARNBOROUGH.—Lat. $51^{\circ} 15'$ N. Long. $0^{\circ} 45'$ W.

Height above Mean Sea Level :—71·5 m.

UPPER AIR TEMPERATURES. SOUTH FARNBOROUGH, 1919.

UPPER AIR TEMPERATURES AT SOUTH FARNBOROUGH—MONTHLY AVERAGES, 1919.

T = Temperature in Degrees Absolute above 200 *a.* N = Number of Observations.

1919.	SURFACE.	HEIGHT IN METRES ABOVE MEAN SEA LEVEL.																																		
		500 m.		1000 m.		1500 m.		2000 m.		2500 m.		3000 m.		3500 m.		4000 m.		4500 m.		5000 m.		5500 m.		6000 m.		6500 m.		7000 m.		7500 m.						
		$\frac{1}{2}$ (Max. + Min.)	T. N.																																	
January .	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>										
January .	75·5	77·0	8	75·0	8	72·0	8	69·5	8	67·5	8	65·0	8	61·5	7	60·0	5	57·0	5	55·0	4	49·0	3	44·5	3	38·0	1	...	...	...	...	...
February .	76·0	76·0	12	74·0	12	72·5	12	70·5	12	69·0	12	67·0	12	64·5	12	61·0	12	58·0	3	54·5	2	54·0	1	50·0	1	46·5	1	42·0	1		
March .	77·0	78·0	13	74·0	13	70·5	13	67·0	13	65·0	13	62·0	12	59·5	12	56·5	12	52·5	7	49·0	7	45·5	7	42·5	7	41·0	3	35·5	2	31·5	1
April .	80·0	82·5	7	79·0	7	75·5	7	72·0	7	69·0	7	66·0	7	62·0	5	58·0	4	54·0	3	51·0	3	46·5	3	42·5	3	42·5	2	38·5	2		
May .	86·5	90·5	16	88·0	16	85·0	16	81·5	16	78·5	16	76·0	16	73·5	15	71·0	13	67·0	12	64·5	11	60·5	9	56·5	7	54·0	7	49·5	2	47·0	2	47·5	1			
June .	87·5	84·5	6	83·5	6	82·0	6	80·5	6	78·5	6	75·5	4	76·5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
July .	87·5	89·5	8	87·0	8	85·0	8	83·0	8	80·5	8	79·0	8	77·5	5	74·0	3	71·0	3	68·0	3	64·5	3	61·0	3	58·5	2	55·0	2	51·0	2	47·5	2			
August .	90·0	90·0	8	89·0	8	86·5	8	84·0	8	82·0	8	80·5	8	80·0	5	78·0	2	76·0	2	74·0	2	71·5	1	68·0	1	
September .	86·0	90·0	12	88·0	12	85·0	12	83·5	12	81·5	12	79·5	11	76·0	10	74·0	7	71·0	6	67·5	5	68·5	1	65·0	1	61·5	1	...	...	...	...	...	...
October .	79·5	82·0	12	79·5	12	75·5	12	74·0	12	72·5	12	70·5	11	66·5	7	62·5	6	59·5	5	59·0	4	...	...	...	...	...	...	...	...	...	...	...	...
November .	76·5	77·0	6	74·5	6	70·5	6	67·0	6	64·5	6	61·0	5	58·0	2	54·0	2	49·0	2	48·5	1	...	...	...	...	...	...	...	...	...	...	...	...
December .	78·0	77·5	6	75·5	6	72·5	6	69·5	6	66·0	6	62·0	5	59·0	4	56·0	2	52·0	1	49·0	1	...	...	...	...	...	...	...	...	...	...	...	...
Year .	81·5	83·0	114	80·5	114	77·5	114	75·0	114	73·0	114	70·5	107	68·0	85	64·0	68	60·5	49	58·0	43	57·5	28	54·0	26	49·0	17	44·0	9	43·0	5	47·5	3			

Notes on Seismological Work at Eskdalemuir Observatory during 1919.

Equipment.—The instrumental equipment consists of three Galitzin pendulums, arranged to record displacements in the north, east, and vertical directions. There are also Omori and Weichert pendulums, but they are not in operation.

The constants of the two horizontal Galitzin instruments underwent no appreciable change during the year. The tables for magnification and lag, published in the *Supplement* for 1915, still hold good.

Earthquakes.—The number of disturbances recorded during the year, excluding those in which the displacement was exceedingly small, was 121—a smaller number than usual. The epicentral distance was determined in 19 cases. The greatest epicentral distances so found were 11,700, 10,400, and 9000 kilometres. In about a dozen other cases the epicentral distance might have been determined but for the disturbing influence of wind on the building. The record on such occasions is difficult to read. The azimuth of the epicentre was determined in two cases. It is only in the absence of wind and microseismal effects that this is possible.

Microseisms.—The amplitude and period of microseisms in the N-S direction at 0 h., 6 h., 12 h., and 18 h. were determined as usual, and have been published in the *Geophysical Journal*. The mean values for the different months of 1919, compared with the average from 1911 to 1918, are given below. The unit for amplitude is the micron ($10^{-6}\text{m} = .001\text{ mm.} = \mu$), for the period, 1 second.

		Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1919.	Amplitude (μ) .	1.8	1.5	2.1	1.2	0.7	0.7	0.3	0.6	1.1	0.9	1.5	3.0
	Period (sec.) .	5.5	5.0	5.1	4.5	4.0	4.2	3.0	4.2	4.7	4.8	5.5	6.6
1911- 1918.	Amplitude (μ) .	2.5	2.6	1.7	1.2	0.7	0.5	0.3	0.4	0.8	1.3	1.8	2.1
	Period (sec.) .	6.1	6.4	5.7	5.4	4.8	4.5	4.4	4.4	4.9	5.3	5.8	5.8

The yearly means of amplitude and period since 1911 are as follows:—

	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.
Amplitude (μ) .	1.1	1.1	1.6	1.6	1.3	1.1	1.1	1.5	1.3
Period (sec.) .	5.2	5.0	5.5	5.4	5.2	5.3	5.2	5.4	4.8

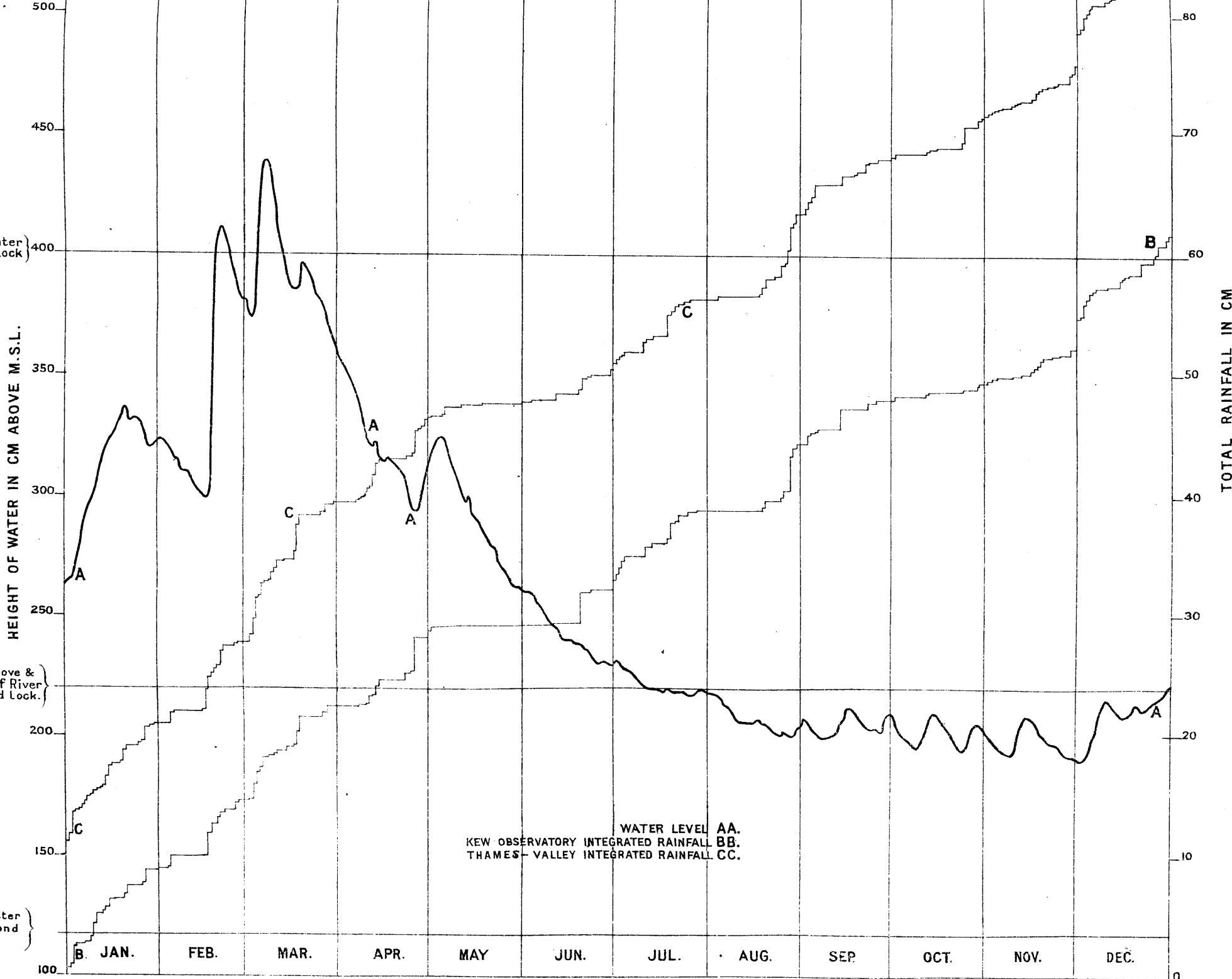
The amplitude of the microseismal displacement increases with the period. The relation is not a linear one—at least for periods above 4.5 seconds. There is no evidence of regular diurnal variation in either amplitude or period.

The Water-Level Recorder at Kew Observatory, Richmond.

A description of the apparatus will be found in the *Annual Supplement* for 1914. Regular observations commenced in July 1914. The values of the mid-height for each day have appeared in the monthly numbers of the Journal, along with the extreme values recorded during the month and the dates on which these presented themselves. The general nature of the variation will be readily derived from the diagram, in which the graph A A shows the fluctuations in water level. The integrated

KEW OBSERVATORY. WATER-LEVEL RECORD. 1919.

Mean High Water at Richmond Lock }
 Low Water above & Mean Height of River below Richmond Lock. }
 Mean Low Water below Richmond Lock. }





rainfall (*i.e.* the total fall up to any assigned date) at Kew Observatory is represented by the graph B B, whilst the general rainfall in the Thames Valley* (obtained from twenty-four stations above Teddington) is integrated in the graph C C. The rainfall scale is five times that for the height of the water in the well. In reading the graph C C, 10 cm. is to be *subtracted* from the amount indicated by the scale on the right of the diagram.

The correlation between the Thames Valley and Kew rainfalls is very close, the ratio between the two being about 5 : 4. The rainfall during the first four months was about 50 per cent. of the total for the year, and so the water was maintained at a high level during this period, the summit of 438 cm. being reached on 8th March.

The drought during May and June quickly brought the water down to its summer level. The scanty rainfall during the latter half of the year hardly affected the level of the water in the well, which was below the Richmond Lock low water-mark from the middle of July to the end of December.

The response of the well to variations in the height of the barometer and to the tide in the neighbouring river has been discussed[†] by E. G. Bilham. The effect of the alternation of spring and neap tides can be easily recognised in the diagram, especially in the autumn months.

A comparison of the graphs for the several years 1914–1919 shows the predominant features of high water-mark in winter and low water-mark in summer. The larger variations of level are mainly governed by the amount of rainfall. It is possible, therefore, to form an approximate idea of the fluctuations of underground water-level from the annual distribution of rainfall, but it is the rainfall of a large area which counts. Even very heavy falls, if quite local, do not affect the water-level appreciably.

The observatory is situated in the Old Deer Park, which lies within a bend of the River Thames, and is not far from Richmond Lock. This lock is half-tidal, *i.e.* at high water there is no obstruction to the flow of the river, at half-tide the sluices come into operation, so that the water above the lock does not fall below the half-tide level, whereas below lock at low tide there is very little water—at any rate in a dry season.

As will be seen from the diagram, the “drought level” of the underground water at the Observatory is very close to that at which the level is maintained above the lock, when the sluices are in use, as they are perhaps for three-quarters of the day. At spring tide the average level of the river throughout the 24 hours is higher than at neap tide, and the underground water rises about 10 cm.

The water may stay at the drought level until well into the winter. For example, there was little rain in the latter months of 1917, and it was not until 15th January 1918 that a rise began. Then there were five wet days (January 15–19), with an aggregate fall of 6 cm. at the Observatory, and the water level rose 160 cm. to the maximum of the year, which was reached on the 20th. The highest level recorded since the installation of the apparatus was 469 cm. above M.S.L. on 23rd March 1916, when parts of the Old Deer Park were flooded.

The downward trend of the water in summer is often arrested by a general rainfall over a wide stretch of the country. Two instances of a remarkable rise in summer are worthy of note. The first occurred in May 1915. The rainfall over the Thames Valley was heavy, 7·9 cm. being recorded at the Observatory in the middle of the

* A chart showing the rainfall of the Thames Valley is published monthly in *Symons's Met. Mag.*

† *Roy. Soc. Proc.*, A94, 1918, p. 165; and *Q. J. R. Met. Soc.*, vol. xliv., 1918, p. 171.

month (May 12th–19th). The corresponding response was 31 cm., and the summit was reached on 24th May, the lag indicating the comparatively slow drainage down the Thames Valley. Similarly in 1917 a total rainfall of 9·1 cm. (July 29th–Aug. 1st) at Kew was attended with a rise of 55 cm. in the water, the lag in this case being 9 days.

The contrast between the immediate response to heavy rainfall in winter and lag in summer is explained by the fact that the soil being saturated in winter, additional rain runs off and into the river channel at once, whilst, in summer, the water has to saturate the subsoil before it begins to run away either over the surface or by underground channels. As a general rule, the greater part of the summer rainfall evaporates before it can make its way to the river. Moreover, the damming up of the water at the lock is probably responsible for the elimination of fluctuations in level due to such part of this summer rain as does contribute to the river flow.

Table of Monthly Means of Magnetic Data for Eskdalemuir, 1919.

The following table gives the mean monthly values of daily maximum and minimum and of the corresponding daily range of the magnetic elements at Eskdalemuir Observatory. The corresponding data published for Kew Observatory in previous years are no longer available. It should be mentioned, however, that the magnetograms for "international quiet days" have been tabulated at that Observatory, and that a summary of the results will be printed in *Hourly Values*.

Month.	North Component.			West Component.			Vertical Component.		
	Max. 15000 γ +	Min. 15000 γ +	Range.	Max. 4000 γ +	Min. 4000 γ +	Range.	Max. 44000 γ +	Min. 44000 γ +	Range.
January . .	γ 1013	γ 917	γ 96	γ 934	γ 834	γ 100	γ 1131	γ 1070	γ 61
February . .	1022	926	96	936	835	101	1112	1052	60
March . .	1030	908	122	940	823	117	1093	1008 –	85+
April . .	1032	926	106	932	835	97	1092	1022 –	70+
May . .	1056	924	132	939	830	109	1119	1029 –	90+
June . .	1050	960	90	934	838	96	1118	1074	44
July . .	1051	957	94	935	843	92	1137	1093	44
August . .	1049	932 –	117 +	931	824 –	107 +	1146 +	1078 –	68 +
September . .	1047	924	123	921	804	117	1132	1032	100
October . .	1048	908 –	140 +	927	797	130	1121 +	1030	91 +
November . .	1016	961	55	893	827	66	1090	1056	34
December . .	1017	953	64	889	819	70	1088	1055	33
Year . .	1036	933 –	103 +	926	826 –	100 +	1115 +	1050 –	65 +

The traces passed the limits of registration on eight days; the value accepted for the maximum or minimum in such a case represents the upper or lower edge of the photographic sheet. Such values have been excluded in the calculation of the monthly means published in the *Geophysical Journal*, Table 6, but are used in obtaining the figures entered in the table above. The mean values of the daily range for the months affected are still underestimated, but the differences from the true values are probably small.

The extreme values for the year and the corresponding annual ranges were as follows:—

	Maximum.	Minimum.	Range.
North Component	16336 γ	<15627 γ	>709 γ
West	5173 γ	4591 γ	582 γ
Vertical	>45415 γ	<44830 γ	>585 γ

**Table of Monthly Means of Electrical Data for Kew Observatory,
Richmond, 1919.**

The following table gives mean values of positive and negative charges obtained with the Ebert apparatus. The observations are made only on certain days, and so the figures do not necessarily represent true means for the months. The number of days utilised for computing the respective means are given in the table.

Charge per c.c. at about 15 h. at Kew Observatory, Richmond. Unit 1×10^{-16} Coulomb.

Year.	Sign of Charge.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Year.
1919	+	0.48	0.49	0.47	0.37	0.61	0.90	0.37	0.48	0.45	0.50	0.42	0.40	0.50
	-	0.27	0.33	0.39	0.28	0.51	0.56	0.20	0.50	0.32	0.25	0.30	0.28	0.35
No. of days utilised	+	7	6	7	6	10	6	7	2	3	10	6	7	77
	-	7	5	7	8	9	8	8	10	7	9	8	8	94

For a reason fully explained in the accompanying note use has been made only of the earlier part of the observation taken on each day. The later part of the observation was undoubtedly affected by an instrumental source of error. It is not impossible that even the earlier part of the observation suffered from the error in question, but at all events it suffered much less than the later part.

A popular account of the method of measurement of positive and negative charges will be found in a paper* by Mr. C. D. Stewart. For a comparison of the units used here and in corresponding tables elsewhere reference may be made to the Introduction. Mean values of potential gradient at Kew Observatory will be printed in *Hourly Values*.

In the means for the year equal weight has been assigned to each individual observation independently of the month it occurs in, as the number of days available was unduly low for some of the months. Owing to the exclusion of the latter part of the daily observation the mean time is some 15 minutes earlier than in previous years. This may have some slight influence on the results.

**A Discussion of the Effects of Deterioration of the Ebert Apparatus
in use at Kew Observatory, Richmond.**

The Ebert apparatus is used to determine the amounts of free positive and negative charges carried by the more mobile ions of the atmosphere. By means of a turbine a measured volume of air is pulled through a hollow cylinder, in the axis of which is a charged rod. The cylinder is earthed, and the co-axial rod is charged negative or positive according as the ionic charge under investigation is positive or negative. The rod is connected to an electrometer, and the observation consists essentially in determining the reduction in voltage accompanying the passage of a given volume of air. The free charge carried by the more mobile ions of sign opposite to that on the rod is given up to the rod, so that, allowance being made for any leak due to imperfect insulation, the reduction in voltage measures the quantity desired.

It has been known for a considerable time that a measurement of the negative ionic charge may be prejudiced if it immediately follows a measurement of the positive ionic charge without any interval elapsing after the second charging of the rod, but

* *Q. J. R. Met. Soc.*, vol. xliv., 1917, p. 409.

it has been supposed that this source of error is negligible if a minute or two be allowed to elapse.

For some years the practice at Kew Observatory had been to have two Ebert instruments in simultaneous operation, one measuring the positive, the other the negative charge. This gave the same mean time for the results obtained for the two signs.

In 1916, however, one of the instruments broke down and repairs could not be executed at the time. It thus became necessary, if observations on both signs of charge were to be made on the same day, to take the two observations successively with a single instrument. To make things as nearly as possible alike for the two charges, the sign of the charge first given to the rod was different on successive days; also, a short interval was allowed after the second charging of the rod before a reading was taken. This procedure continued until January 1920.

The electrometer employed is of the Wulf pattern, having two parallel fibres, the distance between which increases with the voltage. A deterioration of the surface of the fibres, which had presumably set in very gradually, was noticed some years ago. As viewed by the reading microscope, the outline of the fibres appeared furry, as if a coating were peeling off, instead of being sharp, as it was originally. This may not be the cause of the trouble presently to be described, but the chances are that it is.

It had always been customary, after first charging the rod, to leave the instrument in the open for some minutes before observing, but apparent changes of reading during this interval had never been recorded. In 1919 the interval was increased.

The procedure followed was to pull 1200 litres of air through, this occupying about 15 minutes, readings of the electrometer being taken after the passage of each 400 litres. Only the total fall entered into the calculations. The turbine was cut out only after the 1200 litres had passed, and the intermediate readings answering to the passage of the 400 and 800 litres could not claim the same accuracy as the final one. They served merely as a rough check, which occasionally proved useful when—as sometimes happened in damp weather—the insulation deteriorated during the observation. Changes in the electric contents of the atmosphere are at times very considerable in the course of 15 minutes. Thus a good deal of irregularity in the apparent rate of fall of the voltage was accepted as inevitable, even before the deterioration of the fibres. This deterioration diminished the accuracy of reading, which again naturally added to the apparent irregularities. This will explain why the defect was not detected earlier.

It was only gradually that a vague suspicion dawned on the observer that the changes of voltage during the second part of the observation, after the second charging of the rod, tended to be unduly small. In view of this it became customary to pull at least 100, sometimes 500, litres of air through before commencing the second part of the observation. In the beginning of 1920 direct experiment showed that the apparent voltage, when no air was being pulled through, almost invariably *rose* for some minutes after charging, irrespective of the recent history of the instrument. The length of time for which this rise was appreciable might be 5, 10, or even 15 minutes. The instrument behaved as if with a constant charge it had a gradually diminishing capacity. Thus during an ionic charge observation, taken without a prolonged interval after charging, the natural decrease in voltage was opposed by a rise of instrumental origin. The instrumental rise would naturally depend on the charge given to the rod, which was but little variable. Thus the error might be expected to

be relatively greatest when the ionic charges are least, *i.e.* in the winter months, and for the negative charges. As will be seen presently, that is exactly what happened.

To investigate the matter the observations of the years 1917 to 1919 were divided into two categories : (A) Those in which the observation for positive ionic charges (*i.e.* those in which the Ebert rod was charged negative) came first ; (B) those in which the observation for positive charges came second. Suppose that during a certain month or season there are n days in category (A) and n' in category (B), and suppose the sums of the observed daily changes of voltage during this period (each answering to 1200 litres of air and corrected for ordinary leakage) to be A_+ , A_- , B_- , and B_+ . If there were no instrumental defect prejudicing A_- and B_+ , as compared with B_- and A_+ , and if the diurnal variation during the interval—some 25 minutes—between the mean times of the two daily observations were negligible, then, supposing a sufficiently large number of days included to cut out accidents, we should expect to find

$$(A_+/n) \div (B_+/n') = 1, (B_-/n') \div (A_-/n) = 1.$$

At first, the days of each month were considered separately, but the ratios obtained were obviously largely influenced by accident. The results for each year were accordingly recalculated, for the year as a whole, and for two 6-month periods, summer including April to September, and winter the remaining 6 months. The following results were obtained :—

Year.	n .	n' .	Values of $(A_+/n) \div (B_+/n')$.			Values of $(B_-/n') \div (A_-/n)$.		
			Summer. 1·11	Year. 1·14	Winter. 1·15	Summer. 1·06	Year. 1·22	Winter. 1·63
1917	79	83						
1918	85	81	1·37	1·39	1·46	1·43	1·51	1·63
1919	78	93	1·24	1·39	1·71	1·38	1·52	1·62

A similar calculation was made for 1916, but a much smaller number of observations was available, as the practice of using two apparatus was in operation for part of the year. The means from all the observations were 1·24 for the positive and 1·33 for the negative ions. The fact that these values are larger than the means for 1917 does not possess much significance owing to the paucity of observations in most of the summer months of 1916. The single month November contributed almost a quarter of the observations.

In the years 1917 to 1919 the numbers of summer and winter observations were nearly equal, and for these years purely accidental causes, though not wholly eliminated, should have no great influence on the seasonal results. It will be seen that 1918 and 1919 show a marked rise in the ratio as compared with 1917, except in the case of the winter value of $(B_-/n') \div (A_-/n)$. The last three months of 1917 when treated alone gave for this ratio the value 1·93, which suggests that deterioration had certainly commenced by that time. The fact that 1919 shows no progressive rise as compared with 1918 may not unreasonably be ascribed to the increased precautions introduced in the later year.

If we confine ourselves to results obtained from the first daily observation, the values obtained from the seasonal groups are as follows :—

Charge per c.c. Unit 1×10^{-16} Coulomb.

Year.	Positive Charge.			Negative Charge.		
	Summer.	Winter.	Year.	Summer.	Winter.	Year.
1917	0.737	0.481	0.610	0.535	0.377	0.451
1918	0.694	0.488	0.597	0.492	0.318	0.413
1919	0.551	0.462	0.502	0.401	0.300	0.353

These figures are not wholly re-assuring as regards even the first observation of the day in 1919.

The differences between the values of the ratio for the summer and winter seasons, and the positive and negative charges, are on the whole less than might have been anticipated, but are in the expected direction.

The possibility that the difference might be due in whole or in part to the regular diurnal variation naturally suggests itself. It is obvious, however, that only a very rapid change of the electrical conditions could fully account for so large a difference, and the only period of the day when there seems any reasonable chance of a very rapid systematic change is near sunset or sunrise. Thus it is only in winter that such an explanation would seem at all probable *a priori*. The conclusion that the difference was almost entirely of instrumental origin seems unavoidable in view of the subsequent experience during 1920. For the first eleven months of that year the practice was to confine the observations of each day to a single sign, the sign being different on alternate days. On each day observations were taken for two 15-minute periods in succession, the loss due to defective insulation being observed, as has been the practice since 1916, at the end of the first 15-minute period. The instrument was charged a long time before the observation, and 100 litres of air were run through before the regular observations began. During the eleven months there were eighty days when the positive ions were collected and seventy-five when the negative ions were collected. The totals of the charges observed during the first 15-minute and the second 15-minute observations being separately summed, the ratio between these charges was calculated. For positive ions the ratio was 1.02, for negative ions it was 1.06. The winter and summer months being separately dealt with, the values of the ratio were:

1.01 for summer and 1.03 for winter for positive ions.

1.04 for summer and 1.08 for winter for negative ions.

It would thus appear that while a small part of the observed deficiency in the second half of the daily observations from 1917 to 1919 may be of natural origin—at least in the case of negative ions in winter—much the greater part was of instrumental origin. As the values obtained from the complete observation were thus unduly depressed, particulars of the results obtainable from the first half of the daily observations appear desirable for 1917 and 1918 as well as for 1919. The results for 1917 and 1918 are accordingly given in the following table. The remarks already made with reference to the table for 1919 apply also to it.

Charge per c.c. at about 15 h. at Kew Observatory, Richmond. Unit 1×10^{-16} Coulomb.

Year.	Sign of Charge	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Year.
1917	{ +	0.53	0.43	0.75	0.60	0.63	0.82	0.67	0.96	0.66	0.53	0.34	0.43	0.61
	{ -	0.38	0.40	0.40	0.54	0.47	0.65	0.49	0.59	0.52	0.47	0.25	0.39	0.45
1918	{ +	0.42	...	0.55	0.51	0.75	0.55	0.81	0.64	0.91	0.48	0.58	0.39	0.60
	{ -	0.25	...	0.38	0.28	0.49	0.53	0.59	0.45	0.63	0.39	0.27	0.31	0.41

ERRATA.

Page	3,	Table 6. North Component, Mean Range,	<i>insert</i> 96.
"	3,	6. West	" " " 100.
"	3,	6. Vertical	" " " 61.
"	11,	6. North	" " " for 92 read 96.
"	11,	6. West	" " " 96 " 101.
"	11,	6. Vertical	" Maximum, " 1105 " 1112.
"	11,	6. "	" Range, " 54 " 60.
"	19,	6. "	" Minimum, " 1008 " 1011.
"	19,	6. "	" Range, " 85 " 83.
"	27,	6. "	" Maximum, " 1092 " 1093.
"	35,	6. North	" Range, <i>insert</i> 132.
"	35,	6. West	" " " 109.
"	35,	6. Vertical	" " " 84.
"	45, etc.,	5. Heading for charge per c.c. $\times 10^{20}$	read charge per c.c. $\times 10^{16}$.
"	51,	2. Magnetism, 30th, Declination West,	for 23° 1' read 19° 23° 1'.
"	51,	2. " 30th, Inclination,	" 6° 1' " 68° 6° 1'.
"	51,	2. " 31st, Declination West,	" 24° 4' " 19° 24° 4'.
"	53,	6. North Component, Mean Maximum,	" 1052 " 1051.
"	53,	6. " Range,	" 95 " 94.
"	53,	6. Potential Gradient, Volts per metre, Factor,	for 7.24 read 5.92 to 13 h. on 10th. and " 9.63 " 6.29.
"	61,	6. " " " Factor,	" 3.77 " 5.99.
"	67,	2. Mean Pressure, 9h., for 1016.7	read 1015.0.
"	67,	2. " 21h., " 1016.4	" 1014.7.
"	68,	3. " " 9h., " 1017.5	" 1016.2.
"	68,	3. " " 21h., " 1016.9	" 1015.9.
"	68,	4. " " 9h., " 1013.6	" 985.1.
"	68,	4. " " 21h., " 1013.5	" 985.3.
"	77,	2. " " 9h., " 1024.4	" 1022.7.
"	77,	2. " " 21h., " 1025.3	" 1023.6.
"	78,	3. " " 9h., " 1022.0	" 1020.7.
"	78,	3. " " 21h., " 1022.1	" 1020.8.
"	88,	3. " " 9h., " 1008.9	" 1007.6.
"	88,	3. " " 21h., " 1009.1	" 1007.8.
"	88,	4. " " 9h., " 1009.1	" 979.7.
"	88,	4. " " 21h., " 1008.3	" 978.9.
"	89,	6. West Component, Mean Maximum,	for 894 read 893.
"	89,	6. " Range,	" 67 " 66.