

METEOROLOGICAL OFFICE.

BRITISH METEOROLOGICAL AND MAGNETIC YEAR BOOK, 1914,
PART III., SECTION 2.

GEOPHYSICAL JOURNAL, 1914,

COMPRISING

DAILY VALUES OF THE METEOROLOGICAL AND GEOPHYSICAL ELEMENTS
AT THREE OBSERVATORIES OF THE METEOROLOGICAL OFFICE;

TOGETHER WITH

WIND COMPONENTS AT FIXED HOURS AT FOUR ANEMOGRAPH STATIONS;

DAILY VALUES OF SOLAR RADIATION AT SOUTH KENSINGTON;

TABULATIONS AND ANNUAL SUMMARY OF OCCASIONAL SOUNDINGS OF THE UPPER AIR;
AND OF CLOUD OBSERVATIONS.

PRECEDED BY AN INTRODUCTION.

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 1914.

THE Geophysical Journal gives daily values for the meteorological and geophysical elements observed at the three observatories of the Meteorological Office. Data are given for Meteorology, Solar Radiation, Seismology, Atmospheric Electricity, and Terrestrial Magnetism. From the beginning of 1912 the results of ascents at Upper Air Stations at Pyrton Hill (after April 1914, Benson), Aberdeen, Manchester, Brighton, Ditcham Park, Limerick (Mungret College), and South Farnborough have been included in the Journal. The corresponding results for earlier years were published in the Weekly Weather Report. Wind components are given for four additional anemograph stations.

All values are referred to Greenwich Mean Time, and the hours are counted from midnight and numbered 0 to 24.

All the units employed are based on the C.G.S. system.

The tables are as follows :—

1. A table of notes on the records derived from the **Galitzin Seismographs** (two horizontal components and the vertical component) at **Eskdalemuir**, giving (i) the period and amplitude of the microseisms of the North component, not attributed directly to wind or other local disturbance of like character, for each day at the four hours 0 h., 6 h., 12 h., 18 h. The amplitude selected for publication is the greatest which occurs in half an hour, including the time in question, and the period is that characteristic of this largest wave ; (ii) particulars of the earthquakes recorded. The magnitude of an earthquake is indicated by—

I. Perceptible, II. Conspicuous, or III. Strong.

The following notation is used for the other information derived from the records :—

P is the time of arrival of the first phase (longitudinal waves).

S „ „ „ the second phase (transverse waves).

L „ „ „ the long waves.

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

Max. has the same meaning as M, except that the times have not been corrected.

$c_1, c_2 \dots$ are secondary maxima following the principal phase ; only the periods and approximate times will be given.

F is the end.

i is the sudden commencement of a phase.

e means an indistinct commencement of a phase.

T is the period, that is, the duration in seconds of a double oscillation.

A_N is the amplitude of the North-South component of the true displacement of the ground, measured in microns from the position of rest. It is taken to be positive when the displacement is to the *North*.

A_E is the corresponding symbol for the East-West component. It is taken to be positive when the displacement is to the *East*.

A_z is the corresponding symbol for the vertical component. It is taken to be positive when the displacement is *upward*.

The co-ordinates of the epicentre relative to the station are—

Δ , the distance measured along the arc of the great circle in kilometres.

α , the azimuth (0° to 360°) measured from North through East.

μ_s indicates a micron or 0.001 mm.

PR_1, PR_2, PR_3 are longitudinal waves reflected at the earth's surface once, twice, or thrice respectively.

SR_1, SR_2, SR_3 similarly are reflected transverse waves.

The times given for reflected waves refer to the beginning of the disturbance.

2. Daily meteorological data at 9 h. and 21 h. G. M. T. for **Valencia Observatory** in the form customary for entering the corresponding data which are published for eight stations in the British Isles in Section III. of the Year Book (Daily Readings at Meteorological Stations of the First and Second Orders). The instrumental values in the table are taken from the self-recording instruments at the Observatory.

Pressure is given in "millibars" (1000 millibars = one megadyne per square centimetre). One millibar is approximately equivalent to the pressure of 0.75008 mm. of mercury under standard conditions (273° A., Lat. 45°). The name is used in the Journal, following the example of Professor Bjerknæs of Christiania in his work for the Carnegie Institution of Washington. The expression of atmospheric pressure in millibars involves any necessary reduction of the readings of the barometer to standard temperature and latitude.

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 273° A. (0° C.) are printed in small type.

Vapour Pressure, deduced from the readings of the dry and wet bulb by Glaisher's Tables, is given in millibars.

Wind Velocity is expressed in metres per second. The values are estimated for periods of 60 minutes centering at the hours named.

Wind Direction is given in points of the Compass, 32 to the complete revolution, from True North (32), through East (8). No direction is given when the anemometer shows a smaller velocity than 1.6 metres per second. The directions refer to the exact hour, and are not mean values.

Precipitation is given in millimetres of equivalent rainfall. Values of rainfall for Valencia and Kew are for the 24 hours ending at 9.30 a.m.; previous to May 1st, 1914, they were for the 24 hours ending at 10.30 a.m. At Eskdalemuir they have always been for the 24 hours ending at 9.30 a.m.

Sunshine, from the Campbell-Stokes instrument, in hours. The mean daily duration is given instead of the total for the month, in accordance with the practice adopted for the other parts of the Year Book. The estimation of cloud amount and the symbols for weather are in accordance with the conventions of the International Meteorological Committee.

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

BEAUFORT NOTATION AND INTERNATIONAL WEATHER SYMBOLS.

b. blue sky.	w. ☽ dew.	h. ▲ hail.
c. clouds (detached).	x. ⊥ hoar frost.	△ soft hail.
o. overcast.	← ice crystals.	t. ⊥ thunder.
g. gloomy, dull appearance.	∨ rime.	l. < lightning.
u. ugly, threatening appearance.	~ glazed frost.	⚡ thunderstorm.
v. visibility, unusually clear atmosphere.	e. water deposited copiously on exposed surfaces, without rain falling.	☂ gale.
z. ∞ haze.	p. passing showers.	q. squally.
m. ≡ ⁰ mist, light fog.	d. drizzling rain.	☉ solar corona.
f. ≡ fog.	r. ● rain.	⊕ solar halo.
fe. ≡ : wet fog, <i>i.e.</i> fog which deposits water copiously on exposed surfaces.	s. * snow.	☾ lunar corona.
	⊕ snow drift.	☾ lunar halo.
	⊠ 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.

The table also contains the measurements of the **Magnetic elements** made at Valencia on selected days. (See note at end of section 5 below.)

3. A corresponding **meteorological table** for **Kew Observatory**, with a column for **Solar Radiation** in watts per square centimetre, observed between 11 h. 30 m. and 12 h. 30 m., unless otherwise stated. The usual conventional unit for solar radiation, the gramme-calorie per square centimetre per minute, is equivalent to seven hundredths of a watt per square centimetre (·0697 Callendar and Barnes 1902). Columns are provided for **readings at 10 h. of thermometers exposed in the ground** at depths of 1 foot (0·31 m.) and 4 feet (1·22 m.) below the surface, and for the mean recorded **level of water in the ground** during the day.

4. A corresponding **meteorological table** for **Eskdalemuir Observatory**.

5. **Electrical measurements** for **Kew Observatory**. Daily values of the **potential gradient**, volts per metre in the open, are given for the four hours, 3 h., 9 h., 15 h., 21 h., except on the occasions when the trace is so disturbed that a satisfactory reading cannot be obtained. The potential gradient is positive when the potential in the atmosphere is positive compared with the earth. The values are the means for the period from half an hour before to half an hour after the hour named. A negative potential gradient is indicated by a short thick “-” before the number. When the true value is lost because the trace goes beyond the limit of registration within the hour, a value may be assigned to the hour, which is essentially an underestimate. Such values are marked with an asterisk (*). When the fluctuations are too large or rapid to permit of an estimate of the hourly mean, “z” is inserted with an appropriate sign to indicate if the gradient was on the whole positive or negative or too variable to permit the dominant sign to be determined.

The value of the **potential gradient** “in the open” is computed from the readings of the trace of an electrograph with a water-dropping collector by means of a factor determined by observations with a standardised electrometer above a flat area.

The **total charges on the ions**, positive and negative, per cubic centimetre are derived in the usual way (which neglects the presence of the large Langevin ions) from observations made with Ebert's Aspiration apparatus, between 14 h. and 16 h., unless it is otherwise stated.

The **Air-Earth Current**, c_2 , is determined with the apparatus designed by Mr. C. T. R. Wilson.

The **electric character of the day** is indicated both for Kew and for Eskdalemuir by the figures 0, 1, or 2, according to the character of the trace of the electrograph as regards negative electric potential; 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.

For Eskdalemuir an estimate is also given of the character of the day as regards the range of potential irrespective of sign within the hourly periods for which an estimate of the mean potential has to be made in the process of tabulation. This characterisation of the day is indicated by the letters a , b , c , according to the range of oscillation within the hour, using a range of about 1000 volts as a criterion: a means that for no hour of the day was there a range of 1000 volts; b that that range of oscillation was reached in one hour at least but in fewer than six hours; c that the critical range was reached in six hours or more.

These specifications must not be understood to be rigid criteria. More definite specifications can be given only after longer experience.

Magnetic Tables for Kew Observatory, which are sufficiently explained in the headings. The magnetic character of the day is given on the scale "0," "1," "2" of the International Magnetic Commission.

The values of magnetic force are all given in terms of γ , or $\cdot 00001$ C.G.S. magnetic unit, so that $18564 \gamma = \cdot 18564$ C.G.S.

Finally corrected values will be published in Part IV. Section 2 of the Year-Book.

6. Tables of **electrical and magnetic data** for **Eskdalemuir** corresponding with those for Kew, except that at Eskdalemuir the geographical components of magnetic force are directly recorded.

7. A table of **wind components** for four principal anemograph stations of the Meteorological Office. The components resolved along the directions of the four cardinal points are given in metres per second. The components are obtained from the tabulated values of velocity and direction obtained as explained in 2.

8 and 9. Tables giving the results of the **exploration of the free atmosphere** over the British Isles up to heights of 3000 m. by means of **kites and pilot balloons**; and tables giving the results of **soundings of the upper air by registering balloons and pilot balloons**. Directions are given in degrees from true N. (through East). The other units are as in tables 2, 3, 4.

10. A table giving the results of **Observations of Cloud Motion** by Fineman's nephoscope at **Aberdeen**.

11. A table giving the maximum intensity and total amount of **solar radiation** received on a horizontal surface at South Kensington as recorded by the Callendar Instrument.

An **Annual Supplement** gives a summary of the observations of the upper air and of the seismological records, and describes the water level apparatus at **Kew Observatory**.

NAPIER SHAW (*Director*).

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H = 5.5 m. Barometer, H_b = 10.4 m.

Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Sunshine Recorder, h_s = 13.3 m. Cups of Anemometer, h_a = 19.81 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8 = E, 16 = S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 10 h., Sunshine, Solar Radiation, Milliwatts per cm², Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALE OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H = 242.0 m. Barometer, H_b = 237.0 m.

Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.40 m. Sunshine Recorder h_s = 1.5 m. Vane of Anemometer, h_a = 15.0 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 10 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground, and a detailed Remarks column.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

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.

DEERNESS. †

Height of Cups above—Roof 1.5 m., Ground 4.9 m., M.S.L. 57.3 m.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and Date, 3 h., 9 h., 15 h., 21 h., Vel. in Max. Hourly Run, Time of Max. Includes sub-tables for S+N&W+E and S-N&W-E.

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.

GREAT YARMOUTH. †§

Height of Head above—Roof 10.7 m., Ground 12.8 m., M.S.L. 15.9 m. Height of Cups above—Roof 3.7 m., Ground 18.3 m., M.S.L. 22.3 m.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust. Includes sub-tables for S+N&W+E and S-N&W-E.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. * No record. † Robinson Cup Anemometer; Arms 0.61 m.; Diameter of Cups 0.229 m.; Factor 2.2. ‡ Robinson Cup Anemometer Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.8. § Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. ¶ 20 days only. ¶¶ 22 days only. The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.

Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 13. January 15. 12 h. 48 m. to 13 h. 19 m. G.M.T.								ESKDALEMUIR. P. 14. January 20. 12 h. 40 m. to 12 h. 46 m. G.M.T.								ESKDALEMUIR. P. 15. January 21. 12 h. 41 m. to 12 h. 47 m. G.M.T.										
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.					
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.					Direction.	Velocity.	Components.								
				W.-E.	S.-N.						W.-E.	S.-N.						W.-E.	S.-N.							
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Balloon disappeared in distance.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Balloon entered stratus cloud.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Balloon disappeared in st.-cu. cloud.					
	5600	...	...	...	...	...	} 2.9		1055	...	...	...	...	} 2.3		1200	...	...	...	...	} 2.5		
	5500	40	7.2	- 4.6	- 5.5				...	...	...	...	...			...	...	...	...	...		...
	5000	27	6.6	- 3.0	- 5.9				...	...	...	...	...			...	...	...	...	...		...
	4500	31	6.1	- 3.1	- 5.2				...	...	...	...	...			...	...	...	...	...		...
	4000	47	6.6	- 4.8	- 4.5				...	...	...	...	...			...	...	...	...	...		...
	3500	54	6.3	- 5.1	- 3.7				...	...	...	...	...			...	...	...	...	...		...
	3000	48	6.3	- 4.7	- 4.2				...	...	...	...	...			...	...	...	...	...		...
	2500	17	9.8	- 2.8	- 9.4				...	...	...	...	...			...	...	...	...	...		...
	2000	3	5.1	- 0.3	- 5.1				...	...	...	...	...			...	...	...	...	...		...
	1750	357	7.3	+ 0.4	- 7.3				...	...	...	...	...			...	...	...	...	...		...
	1500	2	12.2	- 0.4	- 12.2				...	...	...	...	...			...	...	...	...	...		...
	1250	40	11.5	- 7.3	- 8.8				...	...	...	...	...			...	...	...	...	...		...
	1000	32	9.5	- 5.1	- 8.0			...	...	...	...	...		...	...	...	...	...	...
	750	26	11.1	- 4.9	- 9.9			750	119	8.5	- 7.4	+ 4.1		...	...	...	...	...	...	
	500	26	9.4	- 4.1	- 8.4			500	120	7.4	- 6.4	+ 3.7		...	...	...	...	...	...	
100 m. above ground.	340	29	7.9	- 3.7	- 6.9			340	124	4.3	- 3.6	+ 2.4		...	...	...	...	...	...	
Ground level.	240	15	4.8	- 1.2	- 4.6			240	135	1.5	- 1.1	+ 1.1		...	...	...	...	...	...	
Computed for M.S.L.	0	Station near centre of high pressure.					Lift 59.5 gm.	0	125	8.6	- 7.0	+ 4.9	...	Lift 16.5 gm.	0	Station near centre of high pressure.					Lift 24 gm.					
ESKDALEMUIR. P. 16. January 22. 12 h. 50 m. to 12 h. 57 m. G.M.T.								ESKDALEMUIR. P. 17. January 26. 12 h. 32 m. to 12 h. 37 m. G.M.T.								ESKDALEMUIR. P. 18. January 27. 12 h. 34 m. to 12 h. 46 m. G.M.T.										
Greatest height.	1225	...	...	...	...	...	Balloon entered st.-cu. cloud.	1125	...	...	...	...	...	Balloon was lost in fr.-cu. cloud.	1980	...	...	...	...	...	Balloon was lost in A.-st. cloud.		
	...	...	...	...	...	...	} 2.4	...	...	...	...	...	...	} 3.0	1750	312	12.9	+ 9.5	- 8.6		} 2.4		
	1000	150	8.2	- 4.1	+ 7.1			1000	251	17.6	+ 16.6	+ 5.8			1500	305	10.1	+ 8.3	- 5.8			1250	306	9.2	+ 7.4	- 5.4
	750	150	5.5	- 2.7	+ 4.8			750	245	13.7	+ 12.4	+ 5.8			1000	294	10.5	+ 9.6	- 4.2			750	281	8.7	+ 8.5	- 1.6
	500			500	228	7.6	+ 5.6	+ 5.1			500	267	4.9	+ 4.9	+ 0.3			
100 m. above ground.	340			340	225	10.0	+ 7.1	+ 7.1			340	242	2.8	+ 2.4	+ 1.3			
Ground level.	240	...	0.0	0.0	0.0			240			240	180	1.8	0.0	+ 1.8			
Computed for M.S.L.	0	138	5.6	- 4.2	+ 3.7	...	Lift 19.5 gm.	0	265	14.8	+ 14.7	+ 1.3	...	Lift 74.5 gm.	0	290	12.6	+ 11.8	- 4.3	...	Lift 21 gm.					
ABERDEEN. P. 81. January 28. 11 h. 25 m. G.M.T.																										
Soundings with Pilot Balloons.	Height above M.S.L.	Direction.	Velocity.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.																		
				Components.																						
				W.-E.	S.-N.																					
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	} 2.9 assumed.																			
	1420	...	...	...	...	...															
	1250	245	21.0	+ 19.0	+ 9.0	...																				
	1000	241	17.6	+ 15.3	+ 8.6	...																				
	750	240	14.4	+ 12.4	+ 7.3	...																				
	500	227	16.7	+ 12.3	+ 11.3	...																				
	250	218	14.1	+ 8.6	+ 11.1	...																				
	100	205	7.8	+ 3.3	+ 7.0	...																				
Ground level.	30	180	4.0	0.0	+ 4.0	...																				
Computed for M.S.L.	0	246	22.8	+ 20.8	+ 9.3	...	Lift 48 gm.																			

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. January 9.	8 h. 0 m. G.M.T.	SOUNDING No., R.M.C. 57.		Height above M.S.L.	Pressure.	Temperature.		REMARKS.
		PLACE, MUNGRET COLLEGE.	Latitude, 52° 38' N. Longitude, 8° 41' W.			Reading.	Fall per Km.	
GREATEST HEIGHT, } 12.7 km.	170 mb.	211° A.	Height above M.S.L., } 15 m.	km.	mb.	°A.	°C.	Overcast. Wind S.W. 3. Balloon disappeared to N.E. Inversion 278° to 280° from 1.3 to 1.6 km.
LOWEST TEMPERATURE, } 11.8 km.	...	204° A.		12.0	191	206		
BASE OF STRATOSPHERE, } 11.8 km.	...	204° A.	11.70	200	205	5	3	
			11.0	225	211 209	8	8	
Type No. 1.	...	204° A.	10.0	263	219 217			
			9.10	300	227	9	11	
From observations at Station.	at 7 h.	at 18 h. G.M.T.	9.0	307	228			
			8.0	356	235	7		
PRESSURE (M.S.L.),	1013 mb.	1016 mb.	7.17	400	243			
			7.0	410	244	9		
TEMPERATURE,	285° A.	284° A.	6.0	472	251			
			5.56	500	253	7		
VAPOUR PRESSURE, . . . . .	...	...	5.0	539	257		
			4.18	600	263	7		
GRADIENT WIND:—Direction,	240°	225°	4.0	615	264			
			3.0	698	270	6		
Velocity,	12.8 m/s.	13.5 m/s.	2.97	700	270			
			2.0	791	279	9		
Correction for Curvature,	0.0 m/s.	0.0 m/s.	1.92	800	276			
			1.0	896	277	-2		
Final Components, { W. to E.	+ 11.1 m/s.	+ 9.7 m/s.	0.97	900	277			
			0.10	1000	284	8		
			Ground M.S.L.	1011 1013	285	

10. Observations of Cloud Motion by Fineman's Nephoscope. Aberdeen. Taken at 13 h. (1 p.m.) G.M.T..

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.		S.
			m/s.	m/s.	m/s.	
1	St.-Cu.	270	1.2	+ 1.2	0.0	St.-Cu. of lenticular type.
3	A.-St.	290	4.2	+ 3.9	- 1.4	A.-Cu. or high St.-Cu. degrading into fibrous sheet.
6	Cu.-Nb.	342	10.0	+ 3.1	- 9.5	
8	St.-Cu.	286	4.3	+ 4.1	- 1.2	Becoming lenticular type in W.
14	St.-Cu.	65	4.2	- 3.8	- 1.8	
15	St.-Cu.	357	5.2	+ 0.3	- 5.2	Heavy type of St.-Cu.
17	St.-Cu.	75	6.0	- 5.8	- 1.6	Approximate, as cloud was fused at edges.
19	St.-Cu.	153	5.0	- 2.3	+ 4.5	
20	Cu. to St.-Cu.	178	6.9	- 0.2	+ 6.9	Transition type.
22	St.-Cu.	163	12.5	- 3.6	+ 12.0	St.-Cu. thin and flat.
23	A.-Cu.	238	3.5	+ 3.0	+ 1.9	A.-Cu. above; St.-Cu. below.
26	St.-Cu.	280	6.9	+ 6.8	- 1.2	Inclined to lenticular form.
27	Ci.-St.	342	5.0	+ 1.5	- 4.8	Becoming A.-St. in W.
29	Ci.-Cu.	281	4.6	+ 4.5	- 0.9	
31	Cu. to Fr.-Cu.	217	40 ?	+ 24.0	+ 31.6	Clouds very low.

NOTES.

1. Tables of Upper Air Results.

- Time** is expressed in the hours 1 to 24 of civil reckoning (noon = 12 h.). **Temperatures** are expressed in degrees absolute (273° A. = 0° C.).
- Pressure** is given in millibars (1000 mb. = 1 C.G.S. atmosphere = 750 mm. approximately). **Heights** are given in kilometres (km.).
- Gradient Wind** is taken to be tangential to the isobar and is computed by the formula $\gamma = 2 \omega \rho V \sin \phi$.
- Base of Stratosphere.**—TYPE 1.—When the stratosphere commences with an inversion, the height and temperature of the first point of zero temperature gradient are given.
- TYPE 2.—When the stratosphere begins with an abrupt transition to a temperature gradient below 2° per km. without inversion, the height and temperature of the abrupt transition are given.
- TYPE 3.—When there is no such abrupt change of temperature gradient, the base is taken to be where the mean fall of temperature for the kilometre next above is 2° or less, provided that it does not exceed 2° for any subsequent kilometre. If some other position for the base seems to the tabulator to be more suitable, it is noted in the column for "Remarks."

2. Cloud Observations at Aberdeen.

- The time of the observations is given only when other than 13 h. The nearest hour is usually stated (e.g. if taken at 12 h. 45 m., entered as 13 h., etc.).
 - The velocity is computed from the time in seconds occupied by cloud in passing over the 2.5 cm. radius of middle circle on Fineman's Nephoscope. The formula used is $\frac{1000 V}{H}$, which is $\frac{1000 \times 2.5}{h \times t}$ where h is height of pointer; t is time in seconds of cloud passing, as above mentioned. The pointer is maintained at a height of 10 cm. whenever possible, so that the formula becomes $V = \frac{250}{t}$, where V is the velocity in m/s at the assumed height of 1000 m.
 - Direction is given in degrees from 0° to 360°; reckoned from N. through E. [N = 0°, E = 90°, S = 180°, W = 270°]. The components are positive when the motion of the cloud is from the directions W., S.
- The Remarks give additional information and the time of observation in cases where this differs from 13 h.
- The nomenclature used is that approved for international use. It is explained in the *Observer's Handbook*, M.O. 191, pp. 43 to 46, where illustrations of certain types of cloud are also given.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level :—Station, H = 5·5 m. Barometer, H_b = 10·4 m.

Heights above Ground :—Thermometers, h_t = 3·0 m. Rain-gauge, h_r = 0·53 m. Sunshine Recorder, h_s = 13·3 m. Cups of Anemometer, h_a = 19·81 m.

Table with columns: Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8 = E, 16 = S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 10 h., Sunshine, Solar Radiation, Milliwatts per cent., Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALE OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level :—Station, H = 242·0 m. Barometer, H_b = 237·0 m.

Heights above Ground :—Thermometers, h_t = 0·9 m. Rain-gauge, h_r = 0·40 m. Sunshine Recorder h_s = 1·5 m. Vane of Anemometer, h_a = 15·0 m.

Table with columns: Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 10 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground, and a Remarks column with weather descriptions.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, and Time of Gust. Sub-headers include S., N., W., E. for wind directions. Includes stations HOLYHEAD.†§ and DEERNESS.†. Includes summary rows for S+N&W, S-N&W, W+E, W-E.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, and Time of Gust. Sub-headers include S., N., W., E. for wind directions. Includes stations SCILLY.†§ and GREAT YARMOUTH.†§. Includes summary rows for S+N&W, S-N&W, W+E, W-E.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. * No record. † Robinson Cup Anemometer; Arms 0.61 m.; Diameter of Cups 0.229 m.; Factor 2.2. ‡ Robinson Cup Anemometer; Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.0. § Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.

Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 82. February 4. 11 h. 25 m. G.M.T.							ABERDEEN. P. 83. February 5. 12 h. 25 m. G.M.T.																
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.									
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.												
				W.-E.	S.-N.						W.-E.	S.-N.											
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.					
	550	2.9 assumed.	440	2.7 assumed.	440					
	500	212	13.2	+ 7.0	+ 11.2		400	218	7.1	+ 4.3	+ 5.6		400	218	7.1	+ 4.3	+ 5.6	400	218	7.1	+ 4.3	+ 5.6	
	250	201	7.1	+ 2.5	+ 6.6		250	203	4.1	+ 1.6	+ 3.8		250	203	4.1	+ 1.6	+ 3.8	250	203	4.1	+ 1.6	+ 3.8	
	100	190	7.3	+ 1.3	+ 7.2		100	198	1.6	+ 0.5	+ 1.5		100	198	1.6	+ 0.5	+ 1.5	100	198	1.6	+ 0.5	+ 1.5	
Ground level.	30	180	5.0	0.0	+ 5.0		30	180	3.0	0.0	+ 3.0		30	180	3.0	0.0	+ 3.0		30	180	3.0	0.0	+ 3.0
Computed for M.S.L.	0	221	17.4	+ 11.4	+ 13.1	...	Lift 49 gm.	0	214	11.2	+ 6.3	+ 9.3	...	Lift 37 gm.									
ABERDEEN. P. 84. February 6. 11 h. 40 m. G.M.T.							ABERDEEN. P. 85. February 11. 11 h. 30 m. G.M.T.																
Greatest height.	1650	...	...	...	...	2.7 assumed.	2470	...	...	...	...	2.9 assumed.	Balloon lost in distance. One theodolite used.				
	1500	192	19.4	+ 4.0	+ 19.0		...	...	...	...	...		...	...	
	1250	186	17.8	+ 2.0	+ 17.7		2300	238	36.1	+ 30.5	+ 19.3		2300	238	36.1	+ 30.5	+ 19.3						
	1000	181	13.9	+ 0.3	+ 13.9		2000	241	43.7	+ 38.1	+ 21.4		2000	241	43.7	+ 38.1	+ 21.4						
	750	173	15.4	- 1.8	+ 15.3		1500	241	42.1	+ 36.9	+ 20.2		1500	241	42.1	+ 36.9	+ 20.2						
	500	179	16.1	- 0.3	+ 16.1		1000	246	27.0	+ 24.6	+ 11.1		1000	246	27.0	+ 24.6	+ 11.1						
	250	184	13.2	+ 0.9	+ 13.2		500	237	9.5	+ 8.0	+ 5.2		500	237	9.5	+ 8.0	+ 5.2						
Ground level.	30	190	2.2	+ 0.4	+ 2.2		30	225	7.1	+ 5.0	+ 5.0		30	225	7.1	+ 5.0	+ 5.0						
Computed for M.S.L.	0	196	12.7	+ 3.5	+ 12.2	...	Lift 37 gm.	0	234	14.0	+ 11.3	+ 8.2	...	Lift 49 gm.									
ABERDEEN. P. 86. February 13. 11 h. 20 m. G.M.T.							ABERDEEN. P. 87. February 18. 11 h. 10 m. G.M.T.																
Greatest height.	1770	...	...	...	...	2.9 assumed.	4200	...	...	...	...	2.9 assumed.	One theodolite used. Balloon was lost in distance. The sky was cloudless except for some Ci.-St., low in the SE. The Barometer was quite steady at the time.				
	...	...	...	...	...		4000	207	10.5	+ 4.7	+ 9.3		4000	207	10.5	+ 4.7	+ 9.3	
	...	...	...	...	...		3500	210	10.1	+ 5.0	+ 8.8		3500	210	10.1	+ 5.0	+ 8.8	
	...	...	...	...	...		3000	226	12.1	+ 8.7	+ 8.4		3000	226	12.1	+ 8.7	+ 8.4	
	...	...	...	...	...		2500	243	11.8	+ 10.5	+ 5.4		2500	243	11.8	+ 10.5	+ 5.4	
	1700	218	36.2	+ 22.2	+ 28.6		2000	241	10.6	+ 9.2	+ 5.2		2000	241	10.6	+ 9.2	+ 5.2						
	1500	216	35.0	+ 20.8	+ 28.1		1500	243	11.4	+ 10.1	+ 5.1		1500	243	11.4	+ 10.1	+ 5.1						
	1000	211	24.5	+ 12.8	+ 20.9		1000	238	10.6	+ 9.0	+ 5.6		1000	238	10.6	+ 9.0	+ 5.6						
Ground level.	30	210	7.1	+ 3.5	+ 6.1		30	205	8.1	+ 3.4	+ 7.3		30	205	8.1	+ 3.4	+ 7.3						
Computed for M.S.L.	0	221	21.7	+ 14.2	+ 16.4	...	Lift 50 gm.	0	245	9.7	+ 8.8	+ 4.1	...	Lift 48 gm.									
ABERDEEN. P. 88. February 20. 11 h. 20 m. G.M.T.							ABERDEEN. P. 89. February 25. 11 h. 15 m. G.M.T.																
Greatest height.	2470	...	...	...	...	2.9 assumed.	900	...	...	...	...	2.9 assumed.	Balloon lost in a loose type of cloud, probably St.-Cumuliformis. At first the balloon travelled Eastwards, but swung rapidly round by South to Westwards; hence the smallness of the W.-E. component at 100 m. (marked *). The surface wind was W. at times, but changed to N.E. at 12 h.				
	2300	223	8.1	+ 5.5	+ 5.8		...	...	...	...	...		...	...	
	2000	216	8.1	+ 4.8	+ 6.5		...	...	...	...	...		...	...	
	1500	194	10.6	+ 2.5*	+ 10.3		750	43	7.7	- 5.4	- 5.5		750	43	7.7	- 5.4	- 5.5						
	1000	217	22.7	+ 13.6	+ 18.1		500	55	5.0	- 4.1	- 2.9		500	55	5.0	- 4.1	- 2.9						
	500	211	13.3	+ 6.8	+ 11.4		300	36	4.7	- 2.8	- 3.8		300	36	4.7	- 2.8	- 3.8						
	100	195	6.5	+ 1.7	+ 6.2		100	10	3.0	- 0.5	- 2.9		100	10	3.0	- 0.5	- 2.9						
Ground level.	30	192	4.0	+ 0.8	+ 3.9		30	270	2.5	+ 2.5	0.0		30	270	2.5	+ 2.5	0.0						
Computed for M.S.L.	0	201	10.6	+ 3.8	+ 9.9	...	Lift 49 gm.	0	Pressure distribution irregular.				...	Lift 49 gm.									

Note attached to P. 84.—At 12 h. a nephoscope observation of some St.-Cu. cloud was taken, and, assuming the height as being 2000 m., the components would be W.-E. + 1.8 m/s., S.-N. + 8.8 m/s. At 13 h. nephoscope observations were taken of (1) A.-Cu. cloud (assumed to be 3000 m.) and (2) Ci.-Cu. cloud (assumed at 6000 m.); these give components of (1) W.-E. - 0.3 m/s., S.-N. + 13.5 m/s.; (2) W.-E. + 7.8 m/s., S.-N. + 10.8 m/s.

Note attached to P. 86.—Immediately after balloon ascent (about 11 h. 30 m.) a measurement by nephoscope was made of two distinct layers of upper cloud: (1) a sheet of Ci.-Cu. to A.-Cu., for which a height of 4000 m. was assumed, gave components, W.-E. + 20.8 m/s., S.-N. - 2.0 m/s.; and (2) a higher sheet of coarse Ci.-Cu., for which a height of 6000 m. was assumed, gave components, W.-E. + 27.0 m/s., S.-N. - 5.4 m/s. Both these cloud layers showed a negative value in the S.-N. component.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 90. February 27. 11 h. 15 m. G.M.T.							PYRTON HILL. February 21. 10 h. 15 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.			
		Direction.	Velocity.	Components				Direction.	Velocity.	Components.					
				W.-E. | S.-N.						W.-E. | S.-N.					
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Sent up on account of low barometer. One theodolite used.		
}	4550	...	...	...	...	(See note attached.)	4000	202	16.2	6	15	}		
	4500	279	20.0	+19.8	-3.0	} 2.9 assumed.	...	...	...	...	} ?
	4000	277	20.6	+20.4	-2.5		...	...	...	...	
	3500	265	16.0	+15.9	+1.5		3500	202	16.2	6				15	
	3000	262	14.0	+13.9	+2.0		3000	202	16.2	6				15	
	2500	260	14.9	+14.6	+2.7		2500	200	14.9	5				14	
	2000	267	11.6	+11.6	+0.7		2000	205	14.3	6				13	
	1500	214	16.5	+9.3	+13.6*		1500	210	13.9	7				12	
	1000	194	13.8	+3.3	+13.4		1000	209	12.5	6				11	
500	183	14.0	+0.8	+14.0	500		202	10.8	4	10					
100	192	4.9	+1.0	+4.8	150		194	4.1	1	4					
Ground level.	30	180	5.0	0.0	+5.0	0	240	12.9	11.1	6.5	...	Lift ?			
Computed for M.S.L.	0	240	5.7	+4.9	+2.9	...	Lift 50 gm.	0	240	12.9	11.1	6.5	...	Lift ?	
ESKDALEMUIR. P. 19. February 6. 12 h. 46 m. to 12 h. 56 m. G.M.T.							ESKDALEMUIR. P. 20. February 16. 12 h. 32 m. to 12 h. 40 m. G.M.T.								
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	} 2.1		
}	2100	...	...	...	...	Balloon passed behind Megret Hill.	1320	...	...	...	...	}
	2000	186	27.2	+2.8	+27.1	} 3.1	...	...	...	...	} 2.1			
	1750	198	28.9	+9.1	+27.4		...	...	...	...	
	1500	197	25.7	+7.7	+24.5		...	...	...	...	
	1250	195	18.3	+4.8	+17.7		...	...	...	...	
	1000	195	12.3	+3.1	+11.9		1000	266	18.8	+18.7				+1.4	
	750	192	8.2	+1.7	+8.0		750	266	14.1	+14.1				+0.9	
	500	177	5.9	-0.3	+5.9		500	257	11.3	+11.0				+2.6	
	100 m. above ground.	340	160	5.1	-1.7		+4.7	340	235	10.7				+8.8	+6.1
Ground level.	240	146	4.7	-2.6	+3.9		240	248	12.3	+11.3			+4.8		
Computed for M.S.L.	0	205	15.9	+7.4	+14.4		...	Lift 80.5 gm.	0	282		20.0	+19.6	-4.2	...	Lift 12.5 gm.
ESKDALEMUIR. P. 21. February 18. 12 h. 27 m. to 12 h. 33 m. G.M.T.							ESKDALEMUIR. P. 22. February 25. 12 h. 34 m. to 12 h. 43 m. G.M.T.								
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	} 2.6		
}	1440	...	...	...	...	Balloon entered Cumulus cloud.	1600	...	...	...	...	}
	...	...	...	...	...	} 3.2	1500	348	5.5	+1.2	-5.4			} 2.6
	1250	227	12.0	+8.8	+8.1		1250	12	6.6	-1.4	-6.4				
	1000	230	9.0	+6.8	+5.8		1000	2	6.8	-0.2	-6.8				
	750	227	11.2	+8.2	+7.6		750	5	6.0	-0.5	-6.0				
	500	226	11.1	+7.9	+7.7		500	3	5.9	-0.3	-5.9				
	100 m. above ground.	340	227	12.7	+9.3		+8.6	340	5	5.8	+0.5				-5.8
	Ground level.	240	214	9.2	+5.1		+7.6	240	0	3.0	0.0				-3.0
	Computed for M.S.L.	0	259	10.4	+10.2		+2.0	...	Lift 73 gm.	0	Pressure distribution irregular.				Lift 45 gm.

Note attached to P. 90.—Balloon entered a sheet of Ci.-Cu. cloud, which was measured by nephoscope immediately after completion of flight. The nephoscope readings gave a direction of 270° exactly and a relative velocity at 1000 m. of 3.1 m/s. Assuming the height of clouds as 4600 m., the components are W.-E. +14.3; S.-N. 0.0 m/s. A second measurement an hour later gave components W.-E. +13.3 m/s.; S.-N. 0.0 m/s. This points either to an irregularity in the actual vertical velocity of the balloon, or to a different velocity of air currents at and above the cloud level.

* The sudden jump in the S.-N. component at 1500 m. is quite correct.

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 2.	7 h. 6 m. G.M.T.	SOUNDING No., R.D.P. 51.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
					Reading.	Fall per Km.	
Height above M.S.L.	Pressure.	Temp.	PLACE, DITCHAM PARK.				
			Latitude, 50° 57' N.				
			Longitude, 0° 56' W.				
GREATEST HEIGHT, } 1·2 km.	186 mb.	212° A.	Height above M.S.L., } 160 m.	km.	mb.	°A.	°C.
LOWEST TEMPERATURE, } 11·0 km.	219 mb.	205° A.	PLACE OF FALL, Ilford.	12·00	186	212	
BASE OF STRATOSPHERE, } 11·0 km.	219 mb.	205° A.	Distance, 93 km.	11·55	200	210	-7
Type No. 1.			Orientation, 50° from N.	11·00	219	205	6
				10·00	258	211	6
				9·04	300	220	9
				9·00	303	220	9
				8·00	352	229	8
				7·15	400	236	8
				7·00	408	237	8
				6·00	471	245	8
				5·55	500	241	9
				5·00	538	254	9
				4·18	600	262	9
				4·00	616	263	6
				3·00	700	269	5
				2·00	794	274	5
				1·94	800	274	2
				1·00	900	276	2
				1000	1000	277·5	...
				Ground M.S.L.	1018	...	...

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 3.	7 h. 0 m. G.M.T.	SOUNDING No., R.D.P. 52.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
					Reading.	Fall per Km.	
Height above M.S.L.	Pressure.	Temp.	PLACE, DITCHAM PARK.				
			Latitude, 50° 57' N.				
			Longitude, 0° 56' W.				
GREATEST HEIGHT, } 12·6 km.	185 mb.	208° A.	Height above M.S.L., } 160 m.	km.	mb.	°A.	°C.
LOWEST TEMPERATURE, } 11·2 km.	212 mb.	207° A.	PLACE OF FALL, Dagenham.	12·00	185	208	
BASE OF STRATOSPHERE, } 11·2 km.	212 mb.	207° A.	Distance, 96 km.	11·54	200	208	0
Type No. 1.			Orientation, 52° from N.	11·00	218	208	5
				10·00	258	213	8
				9·03	300	220	8
				9·00	302	221	8
				8·00	351	229	8
				7·12	400	237	9
				7·00	407	238	9
				6·00	469	247	9
				5·54	500	251	8
				5·00	538	255	7
				4·16	600	260	7
				4·00	619	262	9
				3·00	702	271	9
				2·99	700	271	3
				2·00	792	274	3
				1·93	800	274	9
				1·00	899	283	9
				·99	900	283	9
				1000	1000	...	...
				Ground M.S.L.	998	278	...
					1006	...	...

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 4.	7 h. 7 m. G.M.T.	SOUNDING No., R.D.P. 53.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
					Reading.	Fall per km.	
Height above M.S.L.	Pressure.	Temp.	PLACE, DITCHAM PARK.				
			Latitude, 50° 57' N.				
			Longitude, 0° 56' W.				
GREATEST HEIGHT, } 9·4 km.	285 mb.	217° A.	Height above M.S.L., } 160 m.	km.	mb.	°A.	°C.
LOWEST TEMPERATURE, } ...	...	...	PLACE OF FALL, Guildford.	9·03	300	219	
BASE OF STRATOSPHERE, } ...	...	...	Distance, 40 km.	9·00	302	220	8
Type No. ?			Orientation, 45° from N.	8·00	353	228	9
				7·23	400	236	9
				7·00	408	237	9
				6·00	471	246	9
				5·55	500	250	8
				5·00	539	254	8
				4·18	600	260	8
				4·00	615	262	6
				3·00	700	268	6
				2·00	800	277	9
				1·94	900	278	4
				1·00	1000	281	4
				1000	1000	...	...
				Ground M.S.L.	998	278	...
					1015	...	...

9. The Upper Air: Soundings by Registering Balloons (R.) and Pilot Balloons (P.)—continued.

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 5. 15 h. 52 m. G.M.T.	SOUNDING No., R.D.P. 54. PLACE, DITCHAM PARK.	Height above M.S.L.	Pressure.	Temp.	Latitude, 50° 57' N. Longitude, 0° 56' W. Height above M.S.L., } 160 m. PLACE OF FALL, Bagshot. Distance, 46 km. and Orientation, 22° from N.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
								Reading.	Fall per Km.	
GREATEST HEIGHT, } 13.7 km.			146 mb.	219° A.		km.	mb.	°A.	°C.	Inversion from 273° at 1.7 km. to 274° at 2.2 km. Isothermal at 216° from 10.3 to 10.7 km.
LOWEST TEMPERATURE, } 10.3 km.			247 mb.	216° A.		13.00	162	220	1	
BASE OF STRATOSPHERE, } 10.3 km.			247 mb.	216° A.		12.00	189	221		
Type No. 1.						11.65	200	220	-2	
						11.00	222	219	-3	
						10.00	258	216	7	
						9.04	300	223	7	
						9.00	302	223	7	
						8.00	351	230	9	
						7.11	400	238	6	
						7.00	406	239	8	
						6.00	469	245	7	
						5.52	500	250	6	
						5.00	538	253	8	
						4.15	600	259	7	
						4.00	613	260	6	
						3.00	700	266	8	
						2.98	700	266	8	
						2.00	792	274	3	
						1.93	800	274	3	
						1.00	897	277	...	
						.97	900	277	...	
						.013	1000	...	...
						Ground M.S.L.	997	281	...	
							1015	...	...
From observations at Station			at 7 h.	at 18 h. G.M.T.						
PRESSURE (M.S.L.),			1020 mb.	1019 mb.						
TEMPERATURE,			278° A.	278° A.						
VAPOUR PRESSURE,								
GRADIENT WIND:—Direction,			204°	191°						
Velocity,			8.5 m/s.	14.2 m/s.						
Correction for Curvature,			0.0 m/s.	+ 7.9 m/s.						
Final Components, { W. to E.			+ 3.5 m/s.	+ 4.2 m/s.						
{ S. to N.			+ 7.8 m/s.	+ 21.7 m/s.						

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 6. 7 h. 1 m. G.M.T.	SOUNDING No., R.D.P. 55. PLACE, DITCHAM PARK.	Height above M.S.L.	Pressure.	Temp.	Latitude, 50° 57' N. Longitude, 0° 56' W. Height above M.S.L., } 160 m. PLACE OF FALL, Bracknell. Distance, 50 km. and Orientation, 15° from N.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
								Reading.	Fall per Km.	
GREATEST HEIGHT, } 8.7 km.			313 mb.	227° A.		km.	mb.	°A.	°C.	Inversion at surface to 280°. Nearly isothermal from 2.2 to 3.0 km. The trace is a bad one, and the temperatures somewhat doubtful.
LOWEST TEMPERATURE, }		(8.96)	300	...	...
BASE OF STRATOSPHERE, }		8.00	347	231	8	
Type No. ?				7.02	400	239	6	
				7.00	401	239	6	
				6.00	463	245	7	
				5.43	500	249	7	
				5.00	532	252	7	
				4.08	600	258	6	
				4.00	607	259	6	
				3.00	692	265	2	
				2.89	700	265	8	
				2.00	787	267	...	
				1.86	800	268	...	
				1.00	893	275	...	
		93	900	275	...	
		10	1000	...	...
				Ground M.S.L.	993	277	...	
					1009	...	...
From Observations at Station			at 7 h.	at 18 h. G.M.T.						
PRESSURE (M.S.L.),			1014 mb.	1011 mb.						
TEMPERATURE,			278° A.	278° A.						
VAPOUR PRESSURE,								
GRADIENT WIND:—Direction,			189°	210°						
Velocity,			14.3 m/s.	10.7 m/s.						
Correction for Curvature,			0.0 m/s.	+ 1.1 m/s.						
Final Components, { W. to E.			+ 2.2 m/s.	+ 5.9 m/s.						
{ S. to N.			+ 14.1 m/s.	+ 10.2 m/s.						

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 7. 7 h. 0 m. G.M.T.	SOUNDING No., R. 247, E. 9. PLACE, ESKDALEMUIR.	Height above M.S.L.	Pressure.	Temp.	Latitude, 55° 19' N. Longitude, 3° 12' W. Height above M.S.L., } 243 m. PLACE OF FALL, Leith. Distance, 75 km. and Orientation, 0° from N.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
								Reading.	Fall per Km.	
GREATEST HEIGHT, } 12.0 km.			183 mb.	225° A.		km.	mb.	°A.	°C.	
LOWEST TEMPERATURE, } 8.0 km.			336 mb.	225° A.		12.00	183	225	1	
BASE OF STRATOSPHERE, } 8.0 km.			336 mb.	225° A.		11.42	200	225	0	
Type No. 1.				11.00	213	226	-1	
				10.00	248	226	0	
				9.00	288	225	7	
				8.75	300	225	8	
				8.00	336	225	7	
				7.00	390	233	6	
				6.83	400	234	8	
				6.00	452	240	7	
				5.28	500	244	8	
				4.00	597	252	7	
				3.96	600	252	7	
				3.00	683	260	7	
				2.81	700	261	7	
				2.00	778	267	7	
				1.78	800	269	...	
				1.00	884	274	...	
		86	900	275	...	
		020	1000	...	...
				Ground M.S.L.	972	275	...	
					1002	...	...
From observations at Station			at 7 h.	at 18 h. G.M.T.						
PRESSURE (M.S.L.),			1001 mb.	991 mb.						
TEMPERATURE,			275° A.	278° A.						
VAPOUR PRESSURE,								
GRADIENT WIND:—Direction,			220°	211°						
Velocity,			11.2 m/s.	16.4 m/s.						
Correction for Curvature,			+ 6.1 m/s.	0.0 m/s.						
Final Components, { W. to E.			+ 11.1 m/s.	+ 8.4 m/s.						
{ S. to N.			+ 13.3 m/s.	+ 14.1 m/s.						

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.)—continued.

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 2. 7 h. 10 m. G.M.T.				SOUNDING No., R. 269. PLACE, PYRTON HILL. Latitude, 51° 38' Longitude, 1° 0' W. Height above M.S.L., } 150 m. PLACE OF FALL, Lode. Distance, and Orientation, 106 km. 50° from N.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.	Reading.				Fall per Km.		
GREATEST HEIGHT, } 14.2 km.	131 mb.	212° A.		km.	mb.	°A.	°C.	S.E. wind. Went away N. Inversion 278° to 281° in first 300 m. Isothermal at 278° from 7 to 1.0 km.	
LOWEST TEMPERATURE, } 11.5 km.	203 mb.	205° A.		14.00	135	212	-2		
BASE OF STRATOSPHERE, } 11.5 km.	203 mb.	205° A.		13.00	159	210	-3		
Type No. 1.				12.00	187	207			
				11.60	200	205	1		
				11.00	260	208	8		
				1.00	222	216			
				9.08	300	222	7		
				9.00	305	223	8		
				8.00	354	231			
				7.15	400	238	9		
				7.00	409	240	8		
				6.00	472	248			
				5.57	500	252	7		
				5.00	541	255	9		
				4.22	600	263			
				4.00	618	264	6		
				3.02	700	270			
				3.00	702	270	4		
				2.00	796	274			
				1.96	800	274	4		
				1.02	900	278			
				1.00	902	278			
				.16	1000	278			
				Ground M.S.L.	1001	278	...		
					1019		
From observations at Station				at 7 h.	at 18 h. G.M.T.				
PRESSURE (M.S.L.),		1021 mb.		1019 mb.					
TEMPERATURE,		280° A.		280° A.					
VAPOUR PRESSURE,						
GRADIENT WIND:—Direction,		226°		234°					
Velocity,		16.0 m/s.		19.9 m/s.					
Correction for Curvature,		+5.1 m/s.		+7.6 m/s.					
Final Components, { W. to E.		+15.2 m/s.		+22.2 m/s.					
{ S. to N.		+14.7 m/s.		+16.2 m/s.					

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 3. 7 h. 6 m. G.M.T.				SOUNDING No., R. 270. PLACE, PYRTON HILL. Latitude, 51° 38' Longitude, 1° 0' W. Height above M.S.L., } 150 m. PLACE OF FALL, Lode. Distance, and Orientation, 106 km. 56° from N.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.	Reading.				Fall per Km.		
GREATEST HEIGHT, } 11.7 km.	198 mb.	216° A.		km.	mb.	°A.	°C.	Inversion at the surface 278° to 283° at .5 km. Isothermal at 269° from 2.7 to 3.0 km.	
LOWEST TEMPERATURE, } 11.3 km.	212 mb.	208° A.		11.60	200	210			
BASE OF STRATOSPHERE, } 11.3 km.	212 mb.	208° A.		11.00	168	210	6		
Type No. 1.				10.00	261	216			
				9.15	300	222	7		
				9.00	305	223	8		
				8.00	353	231			
				7.19	400	238	9		
				7.00	409	239-241	8		
				6.00	472	248			
				5.60	500	251	7		
				5.00	540	255			
				4.22	600	261	7		
				4.00	616	262	7		
				3.00	700	269	4		
				2.00	795	273			
				1.96	800	273	8		
				1.00	900	281			
					1000	...			
				Ground M.S.L.	998	278	...		
					1016		
From observations at Station				at 7 h.	at 18 h. G.M.T.				
PRESSURE (M.S.L.),		1018 mb.		1019 mb.					
TEMPERATURE,		280° A.		281° A.					
VAPOUR PRESSURE,						
GRADIENT WIND:—Direction,		240°		230°					
Velocity,		15.0 m/s.		10.5 m/s.					
Correction for Curvature,		3.4 m/s.		2.2 m/s.					
Final Components, { W. to E.		15.9 m/s.		9.7 m/s.					
{ S. to N.		9.2 m/s.		8.2 m/s.					

TABLE OF HEIGHTS, PRESSURES, TEMPERATURES, AND HUMIDITY.

1914. February 4. 7 h. 6 m. G.M.T.				SOUNDING No., R. 271. PLACE, PYRTON HILL. Latitude, 51° 38' Longitude, 1° 0' W. Height above M.S.L., } 150 m. PLACE OF FALL, Dunstable. Distance, and Orientation, 33 km. 50° from N.	Height above M.S.L.	Pressure.	Temperature.		Humidity.	REMARKS.
Height above M.S.L.	Pressure.	Temp.	Reading.				Fall per Km.			
GREATEST HEIGHT, } 11.2 km.	216 mb.	210° A.		km.	mb.	°A.	°C.	%.	Wind S.S.E.; cloudy. Inversion 277° to 280° from .3 to .5 km. Inversion 276° to 278° at 1.5 km. on one trace, and isothermal at 276° from 1.5 to 1.7 km. on the other.	
LOWEST TEMPERATURE, } 10.6 km. and over	237 mb.	210° A.		11.00	222	210	4			
BASE OF STRATOSPHERE, } 10.6 km.	237 mb.	210° A.		10.00	260	214	6			
Type No. 2.				9.08	300	219	6			
				9.00	304	220	9			
				8.00	354	229	9			
				7.16	400	237	10			
				7.00	410	239	9			
				6.00	472	248	7	40, 40		
				5.56	500	250	7			
				5.00	541	255	8	50, 50		
				4.21	600	261	8	60, 50		
				4.00	617	263	8	65, 40		
				3.02	700	271				
				3.00	701	271	4			
				2.00	796	275				
				1.96	800	275	3	40		
				1.00	900	278		50		
				.16	1000	278		100		
				Ground M.S.L.	999	278		
					1017		
From observations at Station				at 7 h.	at 18 h. G.M.T.					
PRESSURE (M.S.L.),		1019 mb.		1020 mb.						
TEMPERATURE,		277° A.		281° A.						
VAPOUR PRESSURE,							
GRADIENT WIND:—Direction,		212°		218°						
Velocity,		10.8 m/s.		9.3 m/s.						
Correction for Curvature,		+1.2 m/s.		+0.9 m/s.						
Final Components, { W. to E.		+6.4 m/s.		+6.3 m/s.						
{ S. to N.		+10.2 m/s.		+8.0 m/s.						

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.)—continued.

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 6.	7 h. 0 m.	G.M.T.	SOUNDING No., R. 273.	Height above M.S.L.	Pressure.	Temperature.		Remarks.
						Reading.	Fall per Km.	
Height above M.S.L.	Pressure.	Temp.	PLACE, PYRTON HILL.					
GREATEST HEIGHT, } 11'4 km.	203 mb.	219° A.	Latitude, 51° 38' N.					Strong E. wind, backed to N.W. Inversion at surface.
LONGEST TEMPERATURE, } 10'6 km.	231 mb.	213° A.	Longitude, 1° 0' W.	km.	mb.	°A.	°C.	
BASE OF STRATOSPHERE, } 10'6 km.	231 mb.	213° A.	Height above M.S.L., } 150 m.	11'50	200	...	...
Type No. 1.			PLACE OF FALL, Olney.	11'00	217	214 216	5 5	
			Distance, 56 km.	10'00	253	219 221	10 8	
			and Orientation, 22° from N.	9'00	298	...	...
				8'95	300	...	...
				8'00	448	229	8	
				7'02	400	237	6	
				7'00	402	237	6	
				6'00	463	243	6	
				5'45	500	247	8	
				5'00	533	251	8	
				4'10	600	258	8	
				4'00	608	259	4	
				3'00	694	263	4	
				2'93	700	263	6	
				2'00	789	269	7	
				1'89	800	270	7	
				1'00	895	276	...	
				'95	900	276	...	
				'50	1000	279	...	
From observations at Station.			at 7 h.	at 18 h. G.M.T.	Ground M.S.L.	993	275	...
PRESSURE (M.S.L.),			1014 mb.	1010 mb.		1011
TEMPERATURE,			276° A.	281° A.				
VAPOUR PRESSURE,						
GRADIENT WIND:—Direction,			185°	212°				
Velocity,			14'0 m/s.	10'6 m/s.				
Correction for Curvature,			+ 2'8 m/s.	0'0 m/s.				
Final Components, { W. to E.			+ 1'5 m/s.	+ 5'6 m/s.				
{ S. to N.			+ 16'7 m/s.	+ 9'0 m/s.				

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. February 7.	7 h. 0 m.	G.M.T.	SOUNDING No., R. 274.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
						Reading.	Fall per Km.	
Height above M.S.L.	Pressure.	Temp.	PLACE, PYRTON HILL.					
GREATEST HEIGHT, } ?	Latitude, 51° 38' N.					S. wind ; overcast, raining. Inversion 271° to 272° at 1'3 km. Upper part of the trace too blurred to read. The balloon burst prematurely and did not reach 9 km.
LONGEST TEMPERATURE, } ...	...	...	Longitude, 1° 0' W.	km.	mb.	°A.	°C.
BASE OF STRATOSPHERE, } ...	...	...	Height above M.S.L., } 150 m.	5'80	...	235	8
Type ...			PLACE OF FALL, Pidley.	5'32	500	...	...
			Distance 91 km.	5'00	523	243	9	
			and Orientation, 37° from N.	4'00	600	252	8	
				3'00	687	260	8	
				2'85	700	261	8	
				2'00	782	268	4	
				1'82	800	...	4	
				1'00	890	272	...	
				'90	900	273	...	
					1000	...	...
From observations at Station.			at 7 h.	at 18 h. G.M.T.	Ground M.S.L.	988	279	...
PRESSURE (M.S.L.),			1007 mb.	1002 mb.		1006
TEMPERATURE,			281° A.	281° A.				
VAPOUR PRESSURE,						
GRADIENT WIND:—Direction,			220°	218°				
Velocity,			16'3 m/s.	22'3 m/s.				
Correction for Curvature,			+ 3'5 m/s.	- 2'6 m/s.				
Final Components, { W. to E.			+ 12'7 m/s.	+ 12'1 m/s.				
{ S. to N.			+ 15'2 m/s.	+ 15'5 m/s.				

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.		S.
			m/s.	m/s.	m/s.	
2	Fr.-Cu.	229	31'0	+ 23'3	+ 20'5	Heavy diffuse type. Also Fr.-St. at 550 m. by pilot balloon. Observation at [12 h. 30 m.] Cloud height 500 m. by pilot balloon. Below was some A.-Cu. from 179°. Ci. of coarse type ; became A.-St. later.
3	St.-Cu.	179	15'0	- 0'3	+ 15'0	
4	Ci.-Cu.	233	3'0	+ 2'4	+ 1'9	
5	Fr.-St.	225	23'0	+ 16'3	+ 16'3	
6	Ci.-Cu.	215	2'2	+ 1'3	+ 1'8	
7	Ci.	186	3'0	+ 0'3	+ 3'0	
10	St.-Cu.	212	15'0	+ 8'0	+ 12'8	
11	Fr.-Cu.	240	16'0	+ 13'9	+ 8'0	
13	Ci.-Cu.	281	4'6	+ 4'5	- 0'9	
14	Fr.-Cu.	252	20'0	+ 19'0	+ 6'2	
16	St.-Cu.	225	5'6	+ 4'0	+ 4'0	St.-Cu. formed probably from upper parts of Cu.-Nb. A.-Cu. of lenticular type.
20	A.-Cu.	230	3'5	+ 2'7	+ 2'2	
21	Fr.-Cu.	214	20'0	+ 11'2	+ 16'6	Loose low cloud.
23	St.-Cuf.	189	50'0	+ 8'0	+ 49'5	
24	St.-Cuf.	188	12'0	+ 1'7	+ 11'8	
26	St.-Cu.	230	4'2	+ 3'2	+ 2'7	Diffuse St.-Cu.
27	St.-Cu.	270	2'9	+ 2'9	0'0	

For Notes (1) Tables of Upper Air Results, and (2) Cloud Observations at Aberdeen, see page 6.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H=5.5 m. Barometer, H_b=10.4 m.

Heights above Ground:—Thermometers, h_t=3.0 m. Rain-gauge, h_r=0.53 m. Sunshine Recorder, h_s=13.3 m. Cups of Anemometer, h_a=19.81 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 10 h., Sunshine, Solar Radiation, Milliwatts per cm², Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALEMUIR OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H=242.0 m. Barometer, H_b=237.3 m.

Heights above Ground:—Thermometers, h_t=0.9 m. Rain-gauge, h_r=0.38 m. Sunshine Recorder h_s=1.5 m. Vane of Anemometer, h_a=15 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 10 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground, and Remarks.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and similar for DEERNESS.†. Includes sub-tables for S+N&W+E and S-N&W-E.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and similar for SCILLY.‡ and GREAT YARMOUTH.†‡. Includes sub-tables for S+N&W+E and S-N&W-E.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. † Robinson Cup Anemometer; Arms 0.61 m.; Diameter of Cups 0.229 m.; Factor 2.2. ‡ Robinson Cup Anemometer; Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.8. § Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S, and 10 under W, indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.
Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 23. March 5. 7 h. 0 m. G.M.T.							ESKDALEMUIR. P. 24. March 7. 12 h. 32 m. to 12 h. 54 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.			
		Direc-tion.	Velo-city.	Components				Direc-tion.	Velo-city.	Components.					
													W.-E.	S.-N.	W.-E.	S.-N.
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	2205	...	...	...	...	...	3800	...	...	...	...	...	The balloon was lost sight of in the distance.
	...	...	...	...	...	...	3500	276	17'3	+17'2	-1'9	...	
	...	...	...	...	...	...	3000	286	11'6	+11'2	-3'2	...	
	...	...	...	...	...	...	2500	280	8'4	+8'2	-1'5	...	
	2000	292	16'5	+15'3	-6'2	4'1 assumed.	2000	284	10'2	+9'9	-2'4	...			
	1750	304	14'6	+12'1	-8'3		1750	289	8'8	+8'3	-2'9	...			
	1500	319	12'7	+8'3	-9'5		1500	283	5'7	+5'5	-1'3	2'6			
	1250	307	10'5	+8'4	-6'3		1250	278	8'0	+7'9	-1'1				
	1000	302	12'0	+10'1	-6'4		1000	272	10'2	+10'2	-0'4				
	750	297	10'0	+8'9	-4'6		750	274	7'5	+7'5	-0'5				
	500	285	7'5	+7'2	-2'0		500	263	7'7	+7'6	+1'0				
100 m. above ground. Anemometer.	340	279	4'9	+4'8	-0'7		340	258	9'0	+8'8	+1'8				
	250	270	2'5	+2'5	0'0		250	247	7'0	+6'4	+2'7				
Computed for M.S.L.	0	290	20'3	+19'1	-6'9		...	0	274	10'5	+10'5	-0'7		...	Lift 80 gm.
ESKDALEMUIR. P. 25. March 9. 11 h. 13 m. to 11 h. 50 m. G.M.T.							ESKDALEMUIR. P. 26. March 10. 12 h. 37 m. to 12 h. 53 m. G.M.T.								
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.		m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	6240	1485	Balloon lost in Stratus.	
	6000	248	21'5	+19'9	+7'9		2'7	...	...	...	...	...	...
	5500	247	11'3	+10'4	+4'4		
	5000	255	8'4	+8'1	+2'2	...		...	...	...	...	...	...
	4500	246	5'3	+4'9	+2'2	...		...	...	...	...	...	...
	4000	279	3'3	+3'2	-0'5	...		...	...	...	...	...	...
	3500	295	1'7	+1'5	-0'7	...		...	...	...	...	...	...
	3000	306	1'9	+1'5	-1'1	...		...	...	...	...	...	...
	2500	302	1'0	+0'8	-0'5	...		...	...	...	...	...	...
	2000	270	0'7	+0'7	0'0	...		...	...	...	...	...	...
	1750	315	1'3	+0'9	-0'9	...		...	...	...	...	...	...
	1500	38	1'2	-0'7	-0'9	...		...	...	...	...	...	...
	1250	231	1'9	+1'5	+1'2	...		1250	305	3'5	+2'8	-2'0	1'4		
	1000	174	2'0	-0'2	+2'0	...		1000	297	3'4	+3'0	-1'5			
	750	...	...	...	...	...		750	298	3'0	+2'6	-1'4	
	500	...	...	...	...	...		500	299	3'3	+2'9	-1'6	
	340	...	...	...	...	...	340	300	3'4	+2'9	-1'7		
100 m. above ground. Anemometer.	250	...	0'0	0'0	0'0	...	250	280	2'0	+2'0	-0'3				
Computed for M.S.L.	0	Pressure distribution irregular.			Lift 95 gm.	...	0	330	7'7	+3'9	-6'7	...	Lift 5 gm.		
ESKDALEMUIR. P. 27. March 11. 12 h. 41 m. to 13 h. 3 m. G.M.T.							ESKDALEMUIR. P. 28. March 26. 12 h. 30 m. to 12 h. 35 m. G.M.T.								
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	2120	...	...	...	...	...	735	...	...	...	...	...	Balloon lost in Fracto-Cumulus.
	2000	298	10'7	+9'4	-5'1	2'6	...	...	...	...	...	...
	1750	286	7'6	+7'3	-2'1		
	1500	296	6'3	+5'6	-2'7		
	1250	286	4'0	+3'8	-1'1		
	1000	300	3'2	+2'8	-1'6		
	750	296	3'9	+3'5	-1'7		
	500	283	5'3	+5'2	-1'2		...	500	43	8'9	-6'0	-6'5		1'6	
	340	272	7'0	+7'0	-0'2		...	340	38	4'3	-2'7	-3'4			
	250	270	5'0	+5'0	0'0		...	250	45	5'5	-3'9	-3'9			
100 m. above ground. Anemometer.	340	272	7'0	+7'0	-0'2		...	340	38	4'3	-2'7	-3'4			
	250	270	5'0	+5'0	0'0		...	250	45	5'5	-3'9	-3'9			
Computed for M.S.L.	0	250	9'9	+9'3	+3'4		...	0	275	8'0	+8'0	-0'7		...	Lift 9 gm.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 29. March 27. 11 h. 58 m. to 12 h. 33 m. G.M.T.								ESKDALEMUIR. P. 30. March 28. 11 h. 43 m. to 11 h. 55 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	5215	...	...	...	...	...	1155	...	...	...	...	...	Balloon entered Cumulus cloud.	
	5000	162	8.9	- 2.7	+ 8.4	2.4	...	...	...	...	...	1.3		
	4500	161	9.5	- 3.1	+ 8.9		...	...	...	...	...		...
	4000	159	10.7	- 3.9	+ 9.9		...	...	...	...	...		...
	3500	164	10.0	- 2.7	+ 9.5		...	...	...	...	...		...
	3000	160	7.7	- 2.7	+ 7.2		...	...	...	...	...		...
	2500	177	5.5	- 0.2	+ 5.5		...	...	...	...	...		...
	2000	180	2.4	0.0	+ 2.4		...	...	...	...	...		...
	1750	90	2.0	- 2.0	+ 0.1		...	...	...	...	...		...
	1500	56	2.7	- 2.2	- 1.5		...	...	...	...	...		...
	1250	90	2.4	- 2.4	+ 0.1		...	...	...	...	...		...
	1000	90	3.2	- 3.2	+ 0.1		...	1000	130	6.8	- 4.7		+ 4.8	...	
	750	113	2.9	- 2.6	+ 1.1		...	750	128	6.5	- 5.1		+ 4.0	...	
	500	94	3.0	- 3.0	+ 0.2	...	500	128	6.1	- 4.7	+ 3.7	...			
100 m. above ground.	340	165	3.5	- 3.4	+ 0.9	...	340	146	7.5	- 6.2	+ 4.2	...			
Anemometer.	250	165	1.0	- 0.3	+ 1.0	...	250	130	6.0	- 4.6	+ 3.9	...			
Computed for M.S.L.	0	315	7.7	+ 5.4	- 5.4	...	0	340	10.8	+ 3.7	- 10.2	...	Lift 4 gm.		
ABERDEEN. P. 91. March 4. 11 h. 15 m. G.M.T.								ABERDEEN. P. 92. March 6. 11 h. 45 m. G.M.T.							
Greatest height.	2300	...	...	...	...	2.9 assumed.	The balloon entered a sheet of degraded Strato-Cumulus cloud and was lost to view.	1600	...	...	...	...	2.9 assumed.	Just after balloon ascent the wind began to rise, and at 12 h. 30 m. there was a sudden squall-onset with a veering of the surface wind and a sudden rise of the barometric pressure. The wind was of gale force from 13 h. to 15 h., with a max. squall of 29 m.p.s. at about 14 h. A nephoscope observation of Fr.-Cu. was made at 13 h. and gave components (assuming their height as being 1500 metres) as W.-E. +36 m/s., S.-N. -40 m/s.; while the surface wind at the time was W.-E. +16.6 m/s., S.-N. -6.8 m/s.
	2200	280	12.8	+12.6	-2.2		...	1500	288	42.8	+40.6	-13.4		...	
	2000	289	12.6	+11.9	-4.1		...	1250	286	37.0	+35.6	-10.0		...	
	1500	259	7.2	+7.1	+1.4		...	1000	281	26.7	+26.2	-5.3		...	
	1000	266	6.9	+6.9	+0.5		...	750	274	22.1	+22.0	-1.5		...	
	500	242	8.8	+7.7	+4.1		...	500	266	20.8	+20.7	+1.6		...	
	130	232	7.8	+6.1	+4.8		...	250	260	9.0	+8.9	+1.5		...	
Anemometer.	46	236	3.1	+2.5	+1.7		...	130	254	10.5	+10.1	+2.9		...	
Computed for M.S.L.	0	282	8.3	+8.1	-1.7	...	0	16	11.2	-3.1	-10.8	...	Lift 48 gm.		

8. The Lower Layers of the Atmosphere from the Surface to 3,000 metres (10,000 ft.) above Mean Sea Level—*continued*.

Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 93. March 13. 11 h. 15 m. G.M.T.							ABERDEEN. P. 94. March 16. 11 h. 47 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	m/s.	
	570	1020	Balloon was sent off in squall. Cu. clouds rapidly formed, with sheet of Cu.-St. above. Balloon lost in base of Cu. cloud.	
	975	320	20.3	+13.0	-15.6	...	} 3.0 assumed.	
	...	...	...	...	...	...	750	313	12.4	+9.1	-8.4	...
	500	160	20.6	-7.1	+19.3	...	500	309	11.4	+8.8	-7.2	...		
	300	158	16.8	-6.3	+15.5	...	300	324	10.5	+6.2	-8.5	...		
	130	156	12.1	-5.0	+11.0	...	130	305	18.2	+14.9	-10.4	...		
Anemometer.	46	155	8.1	-3.4	+7.3	...	46	310	13.1	+10.0	-8.4	...		
Computed for M.S.L.	0	180	16.7	0.0	+16.7	...	0	345	30.8	+7.9	-29.2	...	Lift?	

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. March 7. 10 h. 0 m. G.M.T.				SOUNDING No., 281.		Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.	PLACE, PYRTON HILL.	Latitude, 51° 38' N.	Reading.			Fall per Km.		
GREATEST HEIGHT, } 13.6 km.	142 mb.	221° A.	Longitude, 1° 0' W.	Height above M.S.L., } 150 m.	km.	mb.	°A.	°C.	Raining. Vanished overhead. Inversion. 73° to 75° at 7 km.	
LOWEST TEMPERATURE, } 10.3 km.	238 mb.	210° A.	PLACE OF FALL, Washam, France.	Distance, 200 km.	13.00	155	220	4		
BASE OF STRATOSPHERE, } 10.3 km.	238 mb.	210° A.	Orientation, 105° from N.		12.00	182	216	4		
Type No. 1.					11.39	200	216	1		
					11.00	213	215	3		
					10.00	250	212	6		
					9.00	293	218	8		
					8.84	300	219	8		
					8.00	342	226	9		
					7.00	396	235	8		
					6.93	400	236	8		
					6.00	457	243	8		
					5.36	500	249	8		
					5.00	525	251	6		
					4.00	600	257	6		
					3.00	684	263	6		
					2.82	700	264	6		
					2.00	778	269	6		
					1.78	800	270	5		
					1.00	883	274	5		
					.84	900	275	...		
					.01	1000	...	...
					Ground M.S.L.	983	277	...		
						1001	...	...

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.		S.
2	A.-Cu.	304	m/s.	m/s.	m/s.	Small partially formed patches. Broken basal portion. Sudden squall-onset 12 h. 20 m. Approximate, cloud scarcely moving. False Ci. to A.-Cu. above, absolutely motionless.
3	Cu.-Nb.	300	4.2	+ 3.5	- 2.4	
6	Fr.-Cu.	318	11.0	+ 9.6	- 5.5	
9	Cu.	200	36.0	+24.0	-27.0	
10	Cu.-Nb.	315	0.8	+ 0.3	+ 0.8	
11	Cu.	310	10.0	+ 7.1	- 7.1	
16	Ci.-St.	276	12.0	+ 9.2	- 7.7	
26	Nb.	96	1.5	+ 1.5	- 0.2	
27	Cu.	307	16.0	-15.9	+ 1.6	
			7.6	+ 6.0	- 4.6	

11. Solar Radiation at South Kensington.

Day.	JANUARY.					FEBRUARY.					MARCH.					REMARKS.
	Max. Rate, Milli-watts per cm. ²	Daily Amount.		Duration of Bright Sunshine.		Max. Rate, Milli-watts per cm. ²	Daily Amount.		Duration of Bright Sunshine.		Max. Rate, Milli-watts per cm. ²	Daily Amount.		Duration of Bright Sunshine.		
		Joules per cm. ²	% of Ideal.*	Hours.	% of Possible.		Joules per cm. ²	% of Ideal.*	Hours.	% of Possible.		Joules per cm. ²	% of Ideal.*	Hours.	% of Possible.	
1	10	129	24	0'0	0	34	466	57	4'5	50	46	909	67	8'1	278	<p>Note.—1 watt per cm² = 14'35 gramme-calories per cm² per minute. 1 gramme-calorie per minute = 0'7 watt nearly. 1 Joule = 0'239 gramme-calories.</p> <p>If the heat were distributed throughout the atmosphere, 1000 gramme-calories per cm² would be sufficient to raise the temperature 4'1 C. It would take 245 gramme-calories per cm² to raise the temperature of the whole atmosphere 1° C.</p> <p>N.B.—The values of Solar Radiation at South Kensington are obtained from the records of a Callendar Instrument which depends upon the difference of temperature between a black and a bright wire exposed horizontally to radiation from the whole of the sky. The values may be taken as representing the total radiation and the maximum rate of radiation per cm² received by a horizontal surface. If it is desired to compare the values published for Kew and Eskdalemuir in Tables 3 and 4 with the simultaneous value recorded by the Callendar Instrument, the former must be multiplied by the cosine of the zenith distance of the sun at the time of observation. The duration of sunshine in this table is obtained from a Campbell-Stokes Recorder.</p>
2	10	151	27	1'6	19	28	481	58	6'0	265	50	708	52	5'8	53	
3	12	90	16	0'0	0	30	481	56	2'4	26	28	407	29	0'0	0	
4	9	79	14	0'0	0	29	441	51	4'1	46	20	275	19	0'0	0	
5	8	118	22	0'0	0	28	556	63	26'9	56	15	228	16	0'0	0	
6	12	152	27	0'6	9	33	502	56	4'8	48	51	624	43	3'8	34	
7	12	165	29	0'8	12	36	384	42	2'5	26	22	179	13	0'0	0	
8	8	81	14	0'0	0	12	84	11	0'0	0	15	213	16	0'0	0	
9	7	56	10	0'0	0	28	246	39	0'7	8	26	257	37	0'0	0	
10	26	140	24	0'2	3	32	416	43	2'7	28	59	771	50	5'9	52	
11	13	172	29	0'1	1	29	283	12	0'0	0	57	972	62	7'4	64	
12	16	152	25	0'1	1	39	540	54	3'9	40	58	518	33	2'9	25	
13	7	74	12	0'0	0	32	499	49	2'7	28	16	203	18	0'0	0	
14	21	192	31	0'8	10	38	466	45	3'4	34	54	581	36	2'2	19	
15	9	97	15	0'0	0	33	352	34	0'2	2	59	513	31	2'4	20	
16	19	93	14	0'0	0	15	213	20	0'0	0	36	301	19	0'9	8	
17	13	142	22	0'0	0	40	574	57	4'4	44	57	969	44	6'0	50	
18	16	100	15	0'1	1	39	328	30	1'6	16	59	761	44	3'3	27	
19	5	232	20	0'0	0	23	301	27	0'0	0	44	588	33	0'5	4	
20	8	66	10	0'0	0	37	504	45	0'4	4	28	178	10	0'0	0	
21	7	66	10	0'0	0	17	213	18	0'0	0	42	388	21	0'5	4	
22	12	108	15	0'0	0	40	549	47	2'6	25	55	943	52	4'2	34	
23	12	140	20	0'0	0	25	685	57	2'9	28	37	522	28	0'0	0	
24	19	264	28	0'0	0	32	334	27	0'3	3	60	820	45	3'0	24	
25	24	43	17	0'0	0	27	393	32	0'3	3	53	900	46	4'5	36	
26	13	190	25	0'0	0	27	375	30	0'1	1	64	691	36	1'5	12	
27	22	251	33	0'2	3	43	698	54	4'7	45	48	520	27	0'9	7	
28	23	319	41	1'0	12	39	2805	61	6'8	64	58	1155	58	3'7	29	
29	27	344	44	2'7	30	23	384	19	0'0	0	23	384	19	0'0	0	
30	8	100	12	0'0	0	17	312	15	0'0	0	17	312	15	0'0	0	
31	21	219	27	0'1	1	26	1666	81	9'9	77	26	1666	81	9'9	77	
Total	...	4325	22	8'3	3	...	11969	...	68'9	25	...	18256	35	77'4	21	
Mean	13	R=140	22	H=0'27	3	28	R=427	...	H=2'46	25	42	R=589	35	H=2'48	21	
Ratio of Mean Daily Amount to Mean Duration.	$\frac{R}{H} = 518$					$\frac{R}{H} = 174$					$\frac{R}{H} = 238$					

* The "Ideal" intensity of radiation at any instant is taken to be a function of the Sun's altitude only. It is approximately the highest intensity recorded at South Kensington for the corresponding elevation of the Sun. The "Ideal" amount for the day is found by integrating the "Ideal" intensity from sun-rise to sun-set; it is the amount which could be recorded on a day when the atmosphere was in its most transparent state from sun-rise to sun-set. A memoir dealing with the subject is in preparation.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H=5·5 m. Barometer, H_b=10·4 m.

Heights above Ground:—Thermometers, h_t=3·0 m. Rain-gauge, h_r=0·53 m. Sunshine Recorder, h_s=13·3 m. Cups of Anemometer, h_a=20 m.

Table with 22 columns: Day, Pressure at Station Level (9h, 21h), Air Temperature in Degrees Absolute (9h, 21h, Max, Min), Humidity (Vapour Pressure, Percentage, 9h, 21h), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second) (9h, 21h), Cloud Amount and Weather (10h, 22h), Rain 24 hours beginning 10h, Sunshine (hrs, mm), Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10h (0·3 m, 1·2 m), Level of Water in the Ground (Daily Mean, Extremes). Rows 1-30 and Means.

4. ESKDALEMUIR OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H=242·0 m. Barometer, H_b=237·3 m.

Heights above Ground:—Thermometers, h_t=0·9 m. Rain-gauge, h_r=0·38 m. Sunshine Recorder, h_s=1·5 m. Vane of Anemometer, h_a=15 m.

Table with 20 columns: Day, Pressure at Station Level (9h, 21h), Air Temperature in Degrees Absolute (9h, 21h, Max, Min), Humidity (Vapour Pressure, Percentage, 9h, 21h), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second) (9h, 21h), Cloud Amount and Weather (10h, 22h), Rain 24 hours beginning 10h, Sunshine (hrs, mm), Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10h (0·3 m, 1·2 m), Level of Water in the Ground (Daily Mean, Extremes). Rows 1-30 and Means.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

5. KEW OBSERVATORY.

* The mean values of the Potential gradient in Table 5 are for 29 days; they are computed from the data for those days on which values at each of the four hours, 3^h, 9^h, 15^h, 21^h, are given in the table. A similar note applies to the values in Table 6. z denotes the maximum and n the minimum value in the column.

z Indeterminate.

Day.	Remarks.	Potential Gradient, Volts per metre. Factor 1.66.				Charge per cc. × 10 ²⁰ .		Air-Earth Current × 10 ¹⁶ .	Electric Character of Day.	Magnetic Character of Day.	Horizontal Force.			West Declination.						
		3 h.	9 h.	15 h.	21 h.	+	-	c ₂			Maximum. 18000 γ +.	Minimum. 18000 γ +.	Range.	Maximum. 15° +.	Minimum. 15° +.	Range.				
		v/m.	v/m.	v/m.	v/m.	E.-m. U.	E.-m. U.	Amp/cm ² .			γ	h m		γ	h m		γ	h m	γ	h m
1	Fine during day.	475	450	310	345	—	—	1.30	0	1	524	6 48	462	11 19	62	40.7	14 48	24.9	22 33	15.8
2	Fine to fair. ⊕ 11 h.	165	380	130	485	—	—	—	0	1	524	15 40	484	15 59	40	35.8	13 6	26.8	8 42	9.0
3	Fine to fair. ⊕ 13 h.	300	415	195	405	—	—	1.10	0	0	504	0 0	474	11 41	n 30	37.8	12 30	25.7	8 27	12.1
4	◊ 10 h. Dull to fair.	195	70	185	670	—	—	—	2	0	513	23 32	473	11 6	40	34.9	12 41	26.1	8 37	8.8
5	◊ a. and p. Mostly dull.	20	165	160	160	—	—	—	2	0	515	19 23	480	9 55	35	36.6	13 10	26.0	8 1	10.6
6	Fine throughout. ⊓ 22 h. 30 m.	90	255	95	310	—	—	—	1	2	541	16 24	n 402	8 39	n 139	x 45.6	9 4	n 10.9	22 2	x 34.7
7	◊ early and p. Fine a.	z ±	220	z +	385	—	—	—	2	2	540	0 21	457	1 37	83	34.6	12 54	21.8	{ ⁰ 50 ₂₃ 10	12.8
8	Mostly fine. ◊ p.	315	450	185	510	460	650	0.90	2	1	509	21 58	446	8 23	63	34.4	13 8	23.9	3 34	10.5
9	Mostly dull. ◊ p. [21 h.	460	315	165	195	—	—	—	1	1	507	20 50	459	9 50	48	35.4	13 20	20.8	20 25	14.6
10	◊ 0 h.-1 h. and 2 h. Fine. ⊓	130	240	220	460	—	—	—	2	1	512	19 1	456	9 8	56	37.4	13 3	24.6	19 15	12.8
11	◊ 5 h.-8 h. Dull to fine.	415	195	230	230	—	—	—	2	0	506	23 25	454	11 21	52	38.9	12 57	24.5	8 15	14.4
12	Fine throughout.	395	395	210	395	—	—	—	0	0	503	20 9	461	10 23	42	36.9	13 8	24.9	7 49	12.0
13	◊ early. Fine intervals.	395	405	210	195	—	—	—	0	0	510	23 30	458	10 40	52	37.8	14 10	25.8	8 40	12.0
14	Fine all day.	160	240	130	275	—	—	—	0	0	511	22 57	468	11 0	43	35.6	13 54	25.1	8 36	10.5
15	◊ early. Fine all day. ∞	280	715	430	485	—	—	1.05	0	0	505	23 53	473	11 40	32	33.7	14 22	26.6	8 0	n 7.1
16	Fine throughout. ∞	265	500	565	530	—	—	—	0	1	524	21 40	461	12 3	63	36.5	14 30	25.5	3 44	11.0
17	Fine throughout.	335	510	635	450	—	—	1.00	0	1	513	20 10	465	10 19	48	35.1	13 20	26.8	19 55	8.3
18	Fine throughout.	430	335	530	495	—	—	—	0	0	507	15 36	465	11 0	42	36.3	12 50	26.5	8 39	9.8
19	◊ early. Fine throughout.	290	385	290	510	—	—	—	0	1	525	21 29	465	5 14	60	35.5	13 51	24.4	8 12	11.1
20	◊ early. Fine throughout.	255	650	290	460	—	—	1.15	0	0	508	18 20	474	11 22	34	34.2	13 31	24.2	8 14	10.0
21	◊ early. Fine throughout. ∞	350	730	220	485	—	—	—	0	0	508	18 22	476	10 20	32	35.7	12 18	23.8	7 58	11.9
22	◊ early. Fair to fine. ◊ 17 h.	60	240	125	210	—	—	—	2	0	508	23 59	471	11 0	37	35.4	12 56	24.8	8 17	10.6
23	◊ early. d. 10 h. Dull to fine.	240	80	115	415	1220	780	0.50	1	0	511	17 37	479	10 26	32	37.6	14 5	24.1	7 46	13.5
24	◊ early. Mostly fair. ◊ 23 h.	195	265	200	245	610	170	0.90	0	1	517	16 55	464	11 54	53	36.5	13 25	24.1	8 3	12.4
25	Dull early to fine. ◊ 9 h.	160	370	380	605	—	—	—	1	0	503	6 39	464	11 23	39	34.2	13 25	23.6	7 57	10.6
26	◊ early. Fine throughout.	350	345	300	380	—	—	—	0	0	502	20 25	471	11 2	31	34.8	13 13	23.1	8 18	11.7
27	Fine throughout. ∞	130	315	510	565	740	—	0.75	1	1	531	16 52	477	9 47	54	35.3	13 19	23.2	8 10	12.1
28	Fine throughout. ∞	265	495	475	535	—	590	1.15	0	0	507	23 22	471	10 53	36	33.7	13 55	25.0	8 2	8.7
29	◊ early. Mostly fine. ∞	200	345	380	360	360	—	1.10	0	0	501	0 0	462	11 45	39	34.1	13 11	24.8	8 47	9.3
30	Dull and o., with ◊.	275	395	420	510	590	20	0.90	0	0	501	6 30	464	12 0	37	33.9	14 40	25.8	8 28	8.1
M.		262*	367*	286*	409*	—	—	—	—	—	513	—	465	—	48	36.2	—	24.3	—	11.9

6. ESKDALEMUR OBSERVATORY.

Day.	Potential Gradient, Volts per metre. Factor 5.65.				Charge per cc. × 10 ²⁰ .		Air-Earth Current × 10 ¹⁶ .	Electric Character of Day.	Magnetic Character of Day.	North Component.				West Component.				Vertical Component.			
	3 h.	9 h.	15 h.	21 h.	+	-	c ₂			Maximum. 15000 γ +.	Minimum. 15000 γ +.	Maximum. 5000 γ +.	Minimum. 5000 γ +.	Maximum. 45000 γ +.	Minimum. 45000 γ +.						
	v/m.	v/m.	v/m.	v/m.	E.-m. U.	E.-m. U.	Amp/cm ² .			h m	γ	h m	γ	h m	γ	h m	γ	h m	γ	h m	γ	h m
1	271	504	308	587	—	—	—	1 b	1	22 38	1040	950	11 18	14 48	198	109	22 36	18 40	244	190	12 4
2	75	98	z	211	—	—	—	2 c	0	15 40	1035	974	15 55	15 40	176	119	9 36	17 21	212	186	12 12
3	120	211	188	368	—	—	—	1 a	0	1 15	1016	962	12 41	12 32	172	119	8 40	17 0	217	188	12 31
4	180	196	143	286	—	—	—	0 a	0	23 31	1029	974	11 30	13 30	160	119	8 41	17 20	215	193	12 57
5	-564	-278	421	-714	—	—	—	2 c	0	19 20	1025	982	10 37	12 33	170	117	8 58	16 40	208	186	12 12
6	-23	-113	120	-271	—	—	—	2 c	2	16 23	z 1126	n 845	+	16 10	z 259	n -15	22 8	+	z 527 +	142	24 0
7	98	75	98	406	—	—	—	1 b	1	0 17	1072	942	18 7	18 0	163	71	0 55	16 38	215	n 115	0 18
8	-38	75	211	526	—	—	—	1 b	1	21 53	1037	949	8 22	14 48	157	93	3 35	17 47	239	154	3 12
9	158	150	45	45	—	—	—	2 c	1	20 47	1036	970	11 2	14 21	163	76	20 26	20 27	227	198	1 22
10	83	45	113	150	—	—	—	1 b	1	19 0	1042	961	11 50	12 58	169	102	9 10	19 28	220	192	0 59
11	90	68	150	414	—	—	—	1 b	0	19 48	1030	945	13 16	14 27	176	103	9 4	19 36	220	198	12 37
12	180	173	23	90	—	—	—	1 a	0	19 58	1019	965	12 10	13 7	167	103	8 24	16 44	214	191	12 18
13	45	-263	-15	135	—	—	—	2 b	0	23 30	1021	964	12 36	14 13	178	109	8 43	18 36	213	193	12 17
14	-30	135	150	353	—	—	—	1 a	0	22 56	1036	973	11 45	15 30	163	108	9 1	18 16	217	197	12 35
15	218	165	226	391	—	—	—	0 a	1	23 53	1017	975	12 36	14 25	159	118	9 28	18 35	213	201	12 17
16	308	241	263	496	—	—	—	0 a	2	21 35	1045	960	12 3	14 31	173	107	3 46	18 4	240	186	3 17
17	180	361	293	526	—	—	—	0 a	1	19 57	1033	972	11 27	14 31	162	116	1 21	19 0	217	193	12 50
18	211	248	173	436	—	—	—	0 a	1	19 58	1026	966	11 49	13 42	164	117	6 52	19 48	218	196	12 26
19	271	173	278	128	—	—	—	0 a	1	21 21	1039	975	11 55	21 27	169	99	4 52	20 13	226	174	3 8
20	211	316	316	346	—	—	—	0 a	0	18 23	1022	972	12 19	{ ¹⁴ 45 ₁₅ 18}	153	105	8 29	19 30	217	198	12 12
21	173	241	203	203	—	—	—	0 a	0	18 22	1022	970	12 4	14 12	158	101	8 0	20 20	218	197	12 27
22	150	135	128	-113	—	—	—	1 b	1	23 58	1019	975	13 5	14 21	157	110	8 35	21 45	214	198	12 50
23	120	105	z	120	—	—	—	1 b	1	17 37	1032	977	13 12	14 4	179	102	21 47	21 3	232	191	12 36
24	83	241	-180	248	—	—	—	2 b	1	17 52	1037	972	11 33	13 26	170	107	9 16	18 45	233	199	11 5
25	105	113	120	143	—	—	—	1 a	0	17 55	1022	965	11 23	14 12	155	109	8 31	18 33	215	194	11 55
26	128	150	173	173	—	—	—	0 a	0	19 25	1018	974	12 15	13 43	160	102	8 35	3 22	212	190	12 30
27	98	90	211	519	—	—	—	1 a	1	16 52	1048	985	9 47	16 51	178	104	8 13	18 50	228	187	11 18
28	248	301	263	241	—	—	—	0 a	0	23 0	1031	977	10 52	13 48	157	111	8 37	18 43	218	193	11 35
29	301	323	98	150	—	—	—	0 a	0	0 1	1020	965	12 3	13 53	150	112	9 44	18 50	216	197	13 24
30	83	68	83	23	—	—	—	1 a	0	6 38	1017	970	12 1	14 40	155	116	9 22	18 8	216	198	13 6
M.	119*	148*	164*	224*	—	—	—	—	—	—	1034	964									

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust., Time of Gust., and DEERNESS.†. Includes sub-headers for S, N, W, E directions and V, Hrs, Min. for velocity and time.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust., Time of Gust., and GREAT YARMOUTH.†‡. Includes sub-headers for S, N, W, E directions and V, Hrs, Min. for velocity and time.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. † Robinson Cup Anemometer; Arms 0.61 m.; Diameter of Cups 0.229 m.; Factor 2.2. ‡ Robinson Cup Anemometer; Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.8. § Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level. Soundings by Kites (K.) and Pilot Balloons (P.).

BRIGHTON. K. 13. April 5. 10 h.—12 h. G.M.T.

Soundings with Kites.	Height above M.S.L.	Pressure.	Temperature.		Humidity.	Density.	Wind.		Cloud Observations and Remarks.	
			Reading.	Fall per km.			Direction.	Velocity.		
Greatest height.	metres. 500 215 115	mb. 948.7 982.1 994.0	°A. 279.5 281.5 282.7	°C. 7.0 12.0	%. 93 98 98	mb. 9.0 10.9 11.8	mgm/cc. 1.178 1.210 1.220	Degrees from N. 260 250 250	m/s. 18 19 11	St. Kite in and out of cloud at greatest height.
Computed for M.S.L.	(at 13 h.)	1007.8	...	...	...	...	...	265	18.8	...

BRIGHTON. K. 14. April 10. 10 h.—12 h. G.M.T.

Greatest height.	855 215 115	911.2 984.3 996.1	279 284.6 284.0	8.7 6.0	93 93 88	8.8 12.6 11.5	1.133 1.199 1.217	260 240 240	18 14 6 to 9	Sun shining through haze. St. in N.W. and N. Wind 19.5 m/s. at 500 m. approx.
Computed for M.S.L.	(at 13 h.)	1009.9	...	...	...	...	...	238	17.5	...

BRIGHTON. K. 15. April 12. 16 h.—17 h. G.M.T.

Greatest height.	500 215 115	962.9 996.9 1009.0	277.5 281 284	12.3 30.0	60 70 70	5.1 7.5 9.2	1.206 1.232 1.234	310 290 270	7 5 7	
Computed for M.S.L.	(at 18 h.)	1023.0	...	...	...	...	...	230	16.5	

BRIGHTON. K. 16. April 25. 10 h. 20 m.—11 h. 40 m. G.M.T.

Greatest height.	755 500 215 115	939.0 969.0 1003.2 1015.3	275.8 277.0 281.5 285.2	4.7 15.8 37.0	85 85 70 58	6.4 7.0 7.8 8.2	1.183 1.215 1.238 1.237	40 40 40 30	9 9 11 11	Fr.-Cu., St.-Cu. No clouds reached.
Computed for M.S.L.	(at 13 h.)	1029.3	...	...	...	...	...	63	14.2	...

SOUTH FARNBOROUGH. P. 40. April 1. 6 h. 55 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.			
				W.-E.			S.-N.
Greatest height.	metres. 4060 ... 4000 3500 3000 2500 2000 1750 1500 1250 1000 750 500 185 85	Degrees from N. 214 219 224 223 213 205 201 200 203 207 217 161 135	m/s. 23.8 21.0 17.0 14.7 15.3 14.2 17.7 15.8 12.4 10.8 10.3 9.2 3.0	m/s. +13.3 +13.3 +11.8 +10.1 +8.4 +5.9 +6.3 +5.5 +4.8 +4.9 +6.1 -3.0 -2.1	m/s. +19.7 +16.2 +12.2 +10.7 +12.8 +12.9 +16.5 +14.8 +11.4 +9.6 +8.2 +8.7 +2.1	2.4	Rather hazy Ci., at start; clearing to Ci. at finish. Little Ci.-St. Ci. moving from W.S.W. Balloon lost in distance.
Computed for M.S.L.	(at 7 h.)	205	5.9	+ 2.5	+ 5.4	...	...

SOUTH FARNBOROUGH. P. 41. April 2. 18 h. 10 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.			
				W.-E.			S.-N.
Greatest height.	metres. 4630 ... 4500 4000 3500 3000 2500 2000 1750 1500 1250 1000 750 500 185 85	Degrees from N. 269 260 276 272 272 267 297 294 275 276 280 279 284 270	m/s. 15.5 15.4 12.4 10.7 10.2 3.7 5.8 5.2 4.9 5.5 5.4 4.3 3.3 2.0	m/s. +15.5 +15.2 +12.3 +10.7 +10.2 +3.7 +5.2 +4.8 +4.9 +5.5 +5.3 +4.2 +3.2 +2.0	m/s. +0.3 +2.6 -1.3 -0.3 -0.4 +0.2 -2.6 -2.1 -0.4 -0.6 -0.9 -0.8 0.0	2.4	Clear. St. patches in W. Balloon lost in failing light.
Computed for M.S.L.	(at 18 h.)	Station in tongue of high pressure.	...	...	...	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 42. April 3. 6 h. 55 m. G.M.T.							SOUTH FARNBOROUGH. P. 43. April 8. 6 h. 45 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	5765	...	...	...	...	...	6475	...	...	...	...	...	Clear and cloudless. Balloon lost in distance.
	...	...	...	...	...	...	6400	314	19.2	+13.8	-13.3	...	
	...	...	...	...	...	...	6000	312	16.4	+12.2	-11.0	...	
	5500	264	13.0	+12.9	+1.4	...	5500	312	15.2	+11.3	-10.2	...		
	5000	269	11.5	+11.5	+0.2	...	5000	317	15.4	+10.5	-11.3	...		
	4500	270	12.2	+12.2	0.0	...	4500	319	16.2	+10.7	-12.1	...		
	4000	279	11.3	+11.2	-1.7	...	4000	315	14.1	+10.0	-9.9	...		
	3500	270	10.5	+10.5	0.0	...	3500	310	12.6	+9.6	-8.1	...		
	3000	287	13.3	+12.7	-3.9	...	3000	305	10.0	+8.2	-5.8	...		
	2500	291	11.2	+10.5	-4.0	2.4	2500	295	9.6	+8.7	-4.0	2.4		
	2000	304	7.4	+6.1	-4.1	...	2000	292	8.1	+7.5	-3.1	...		
	1750	311	6.8	+5.1	-4.4	...	1750	291	8.0	+7.4	-2.9	...		
	1500	315	5.9	+4.2	-4.1	...	1500	287	7.7	+7.3	-2.3	...		
	1250	325	6.2	+3.5	-5.1	...	1250	290	7.7	+7.2	-2.6	...		
	1000	340	4.7	+1.6	-4.4	...	1000	294	8.0	+7.3	-3.3	...		
	750	10	3.0	-0.5	-2.9	...	750	293	8.1	+7.4	-3.2	...		
	500	349	3.7	+0.7	-3.6	...	500	287	8.7	+8.3	-2.6	...		
	185	268	5.0	+5.0	+0.2	...	185	270	5.7	+5.7	0.0	...		
	85	250	3.0	+2.8	+1.0	...	85	225	2.0	+1.4	+1.4	...		
Computed for M.S.L.	(at 7 h.)	302	7.6	+6.5	-4.0	...	(at 7 h.)	301	9.7	+8.3	-5.0	...	...
SOUTH FARNBOROUGH. P. 44. April 9. 7 h. 10 m. G.M.T.							SOUTH FARNBOROUGH. P. 45. April 15. 6 h. 50 m. G.M.T.							
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	1790	...	...	...	...	...	4915	...	...	...	...	...	Hazy, but cloudless. Balloon lost in haze.
	...	...	...	...	...	...	4845	336	13.4	+5.4	-12.3	...	
	...	...	...	...	...	...	4500	344	16.6	+4.7	-15.9	...	
	...	...	...	...	...	...	4000	350	13.5	+2.4	-13.3	...	
	...	...	...	...	...	...	3500	2	12.5	-0.4	-12.5	...	
	...	...	...	...	...	...	3000	19	13.5	-4.5	-12.7	...	
	...	...	...	...	...	...	2500	20	10.8	-3.7	-10.1	...	
	...	...	...	...	...	...	2000	23	10.0	-3.9	-9.2	...	
	1720	221	15.7	+10.2	+11.9	2.4	1750	24	8.3	-3.4	-7.6	...		
	1500	223	17.9	+12.2	+13.1	...	1500	28	5.3	-2.5	-4.7	...		
	1250	227	19.6	+14.3	+13.4	...	1250	54	5.8	-4.7	-3.4	...		
	1000	227	16.5	+12.1	+11.2	...	1000	69	6.6	-6.1	-2.4	...		
	750	220	15.3	+9.8	+11.8	...	750	71	6.5	-6.1	-2.1	...		
	500	213	15.2	+8.3	+12.7	...	500	67	5.9	-5.4	-2.3	...		
	185	195	8.6	+2.3	+8.3	...	185	...	...	?	?	...
	85	160	7.0	-2.4	+6.6	...	85	315	2.0	+1.4	-1.4	...		
Computed for M.S.L.	(at 7 h.)	220	16.2	+10.5	+12.5	...	(at 7 h.)	Station in centre of anticyclone				...		
SOUTH FARNBOROUGH. P. 46. April 16. 7 h. 10 m. G.M.T.							SOUTH FARNBOROUGH. P. 47. April 17. 10 h. 55 m. G.M.T.							
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	2640	...	...	...	...	...	1930	...	...	...	...	...	Slight haze in which balloon was lost.
	2500	76	14.4	-13.9	-3.5	...	...	...	...	...	...	...
	2000	83	14.7	-14.6	-1.8	...	...	...	...	...	...	...
	1750	85	14.8	-14.7	-1.3	...	1750	117	17.3	-15.4	+7.8	...		
	1500	81	15.7	-15.5	-2.5	...	1500	119	11.7	-10.2	+5.7	...		
	1250	80	14.1	-13.9	-2.4	2.4	1250	120	13.6	-11.8	+6.8	...		
	1000	74	12.2	-11.7	-3.4	...	1000	116	10.2	-9.2	+4.4	...		
	750	78	12.1	-11.8	-2.6	...	750	101	12.8	-12.5	+2.5	...		
	500	94	9.0	-8.9	+0.7	...	500	94	13.6	-13.6	+1.0	...		
	185	69	4.9	-4.6	-1.8	...	185	77	12.9	-12.6	-2.9	...		
	85	?	?	?	?	...	85	?	?	?	?	...		
Computed for M.S.L.	(at 7 h.)	Station near centre of anticyclone.				...	(at 13 h.)	130	18.1	-13.8	+11.6	...	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 48. April 18. 7 h. 0 m. G.M.T.								SOUTH FARNBOROUGH. P. 49. April 20. 7 h. 20 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.		Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.						Direction.	Velocity.	Components.				
				W.-E.	S.-N.							W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Slight haze. Cloudless. Balloon lost in distance.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Slight haze, but cloudless.		
	5200	...	...	...	...	...		7045	...	...	...	...	...
	5000	144	13.2	-7.8	+10.6	...		6975	68	10.8	-10.0	-4.0	...			
	4500	146	12.3	-6.8	+10.2	...		6500	72	8.3	-7.9	-2.6	...			
	4000	153	6.5	-3.0	+5.8	...		6000	71	6.9	-6.5	-2.2	...			
	3500	150	8.5	-4.2	+7.3	...		5500	58	8.4	-7.1	-4.4	...			
	3000	153	9.5	-4.3	+8.4	2.4		5000	44	8.3	-5.8	-5.9	...			
	2500	134	10.1	-7.3	+7.0	...		4500	75	5.3	-5.1	-1.4	...			
	2000	127	8.3	-6.6	+5.0	...		4000	71	8.0	-7.5	-2.6	...			
	1750	131	9.4	-7.1	+6.2	...		3500	58	8.2	-6.9	-4.3	...			
	1500	126	17.0	-13.7	+10.0	...		3000	87	4.2	-4.2	-0.2	...			
	1250	117	17.3	-15.4	+8.0	...		2500	99	5.6	-5.5	+0.9	...			
	1000	108	9.9	-9.4	+3.1	...		2000	101	4.3	-4.2	+0.8	...			
	750	126	6.5	-5.3	+3.8	...		1750	92	3.6	-3.6	+0.1	...			
	500	129	12.8	-9.9	+8.0	...		1500	76	4.0	-3.9	-1.0	...			
	185	109	8.9	-8.4	+2.9	...		1250	79	3.7	-3.6	-0.7	...			
	85	?	?	?	?	...		1000	69	4.2	-3.9	-1.5	...			
Computed for M.S.L.	(at 7 h.)	142	16.1	-12.7	+10.0	...	...	(at 7 h.)	Station in tongue of high pressure.				...		
SOUTH FARNBOROUGH. P. 50. April 22. 6 h. 55 m. G.M.T.								SOUTH FARNBOROUGH. P. 51. April 24. 6 h. 55 m. G.M.T.								
Greatest height.	2500	...	...	...	...	...	Slight haze. Ci. and little Ci.-Cu. at 6 h. 30 m. Balloon burst. Very light S.W. or W. surface drift.	5900	...	...	...	...	...	Clear. Thin sheet of Ci.-St. covering sky, through which sun shone weakly. Balloon lost in distance.	
	2430	116	4.1	-3.7	+1.8	2.4		5835	313	15.1	+11.0	-10.3	...			
	2000	163	3.1	-0.9	+2.9	...		5500	305	16.7	+13.6	-9.7	...			
	1750	170	3.4	-0.6	+3.3	...		5000	313	17.1	+12.4	-11.7	...			
	1500	173	4.6	-0.6	+4.6	...		4500	318	18.4	+12.3	-13.7	...			
	1250	180	3.7	0.0	+3.7	...		4000	317	16.9	+11.5	-12.4	...			
	1000	161	3.1	-1.0	+2.9	...		3500	322	17.1	+10.4	-13.5	...			
	750	225	1.3	+0.9	+0.9	...		3000	330	13.6	+6.8	-11.8	...			
	500	275	4.2	+4.2	-0.4	...		2500	317	16.5	+11.3	-12.0	...			
	185	?	?	?	?	...		2000	317	20.4	+13.8	-15.0	...			
	85	0	0	0	0	...		1750	317	14.3	+9.7	-10.5	...			
Computed for M.S.L.	(at 7 h.)	230	3.0	+2.4	+2.0	...	...	(at 7 h.)	281	16.0	+15.7	-3.1	...	...
SOUTH FARNBOROUGH. P. 52. April 27. 11 h. 12 m. G.M.T.								SOUTH FARNBOROUGH. P. 53. April 29. 11 h. 0 m. G.M.T.								
Greatest height.	2215	...	...	...	...	...	Hazy, but cloudless. Balloon lost in haze.	5765	...	...	...	...	...	Cloudless. Hazy, but clearing somewhat during the ascent. Balloon lost in haze.	
	2000	75	5.9	-5.7	-1.5	2.4		5700	155	8.4	-3.5	+7.6	...			
	1750	82	5.2	-5.1	-0.7	...		5500	150	8.0	-3.9	+6.9	...			
	1500	62	5.1	-4.5	-2.4	...		5000	147	7.6	-4.1	+6.4	...			
	1250	59	6.8	-5.8	-3.5	...		4500	145	3.7	-2.1	+3.0	...			
	1000	66	4.9	-4.5	-2.0	...		4000	150	3.2	-1.6	+2.8	...			
	750	81	2.5	-2.5	-0.4	...		3500	188	2.8	+0.4	+2.8	...			
	500	90	2.6	-2.6	0.0	...		3000	170	3.3	-0.5	+3.2	...			
	185	114	1.8	-1.6	+0.7	...		2500	158	1.3	-0.5	+1.2	...			
	85	0	0	0	0	...		2000	186	1.9	+0.2	+1.9	...			
Computed for M.S.L.	(at 13 h.)	156	8.0	-3.3	+7.3	...	...	(at 13 h.)	70	6.1	-5.8	-2.1	...	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 95. April 2. 11 h. 20 m. G.M.T.								ABERDEEN. P. 96. April 20. 8 h. 0 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	2120	...	...	...	...	...	3510	...	...	...	...	...	At the commencement of the flight the balloon swung about most erratically, so that no definite components could be given. The balloon was lost in a high haze.
	...	...	...	...	...	...	3000	243	6.8	+ 6.0	+ 3.1	} 2.9 assumed.	
	...	...	...	...	...	...	2500	257	6.8	+ 6.6	+ 1.5		
	2000	235	10.9	+ 8.9	+ 6.2	} 2.9 assumed.	2000	267	6.8	+ 6.8	+ 0.4				
	1500	231	11.5	+ 8.9	+ 7.3		1500	228	3.8	+ 2.8	+ 2.5				
	1000	231	12.6	+ 9.8	+ 7.9		1000	228	4.7	+ 3.5	+ 3.2				
	500	227	6.5	+ 4.7	+ 4.4		500	170	1.7	- 0.3	+ 1.7				
	130	230	5.5	+ 4.2	+ 3.5		130	...	...	...	...
Anemo-meter.	46	220	5.2	+ 3.3	+ 4.0		46	...	0.0	0.0	0.0				
Computed for M.S.L.	(at 13 h.)	225	6.4	+ 4.5	+ 4.5		...	(at 7 h.)	236	10.7	+ 8.9	+ 6.0	...	Lift 47 gms.	
ABERDEEN. P. 97. April 28. 7 h. 49 m. G.M.T.								ABERDEEN. P. 98. April 29. 7 h. 45 m. G.M.T.							
Greatest height.	3340	...	...	...	...	} 2.9 assumed.	1620	...	...	...	...	} 3.0 assumed.	The balloon disappeared in an indefinite cloud film, which was much below a stratum of St.-Cu.
	3000	258	12.4	+ 12.1	+ 2.5		...	...	...	...	...
	2500	256	14.3	+ 13.8	+ 3.5		...	...	...	...	...
	2000	263	12.1	+ 12.0	+ 1.4		...	...	...	...	...
	1500	296	5.9	+ 5.3	- 2.6		...	1500	297	9.6	+ 8.5		- 4.4		
	1000	236	6.2	+ 5.1	+ 3.5		...	1000	308	11.8	+ 9.2		- 7.3		
	500	119	3.1	- 2.7	+ 1.5		...	500	313	5.9	+ 4.3		- 4.0		
Anemo-meter.	46	66	1.0	- 0.9	- 0.4	...	130	320	5.0	+ 3.2	- 3.8				
Computed for M.S.L.	(at 7 h.)	286	11.9	+ 11.4	- 3.3	...	46	315	3.0	+ 2.1	- 2.1	...	Lift 57 gms.		
ESKDALEMUIR. P. 29. April 3. 12 h. 34 m. to 12 h. 50 m. G.M.T.								ESKDALEMUIR. P. 30. April 4. 10 h. 56 m. to 11 h. 11 m. G.M.T.							
Greatest height.	1895	...	...	...	...	} 1.7	1495	...	...	...	...	} 1.3	Balloon disappeared in Cumulus.
	1750	282	11.2	+ 10.9	- 2.4		...	...	...	...	...
	1500	275	9.9	+ 9.9	- 0.8		...	...	...	...	...
	1250	265	7.8	+ 7.8	+ 0.7		...	1250	170	7.3	- 1.3		+ 7.2		
	1000	260	9.1	+ 9.0	+ 1.5		...	1000	173	5.2	- 0.6		+ 5.2		
	750	261	6.3	+ 6.2	+ 1.0		...	750	181	4.2	+ 0.1		+ 4.2		
	500	245	6.8	+ 6.1	+ 3.0		...	500	158	5.4	- 2.0		+ 5.0		
100 m. above ground. Anemo-meter.	340	219	6.2	+ 3.9	+ 4.8	...	340	150	7.1	- 3.5	+ 6.1				
	250	247	6.5	+ 6.0	+ 2.5	...	250	158	4.0	- 1.5	+ 3.7				
Computed for M.S.L.	(at 13 h.)	270	5.9	+ 5.9	0	...	(at 13 h.)	205	5.6	+ 2.4	+ 5.1	...	Lift 4 gms.		
ESKDALEMUIR. P. 31. April 14. 12 h. 38 m. to 12 h. 45 m. G.M.T.								ESKDALEMUIR. P. 32. April 15. 12 h. 12 m. to 12 h. 37 m. G.M.T.							
Greatest height.	1360	...	...	...	...	} 2.7	3545	...	...	...	...	} 2.2	Balloon eventually lost in haze.
	3000	346	6.9	+ 1.7		- 6.7		
	2500	301	6.9	+ 5.9		- 3.5		
	2000	277	2.6	+ 2.6		- 0.3		
	1750	282	2.4	+ 2.3		- 0.5		
	1250	320	16.7	+ 10.8	- 12.8		...	1500	288	3.0	+ 2.8		- 0.9		
	1000	303	11.6	+ 9.2	- 7.0		...	1250	284	3.7	+ 3.6		- 0.9		
	750	296	6.9	+ 6.2	- 3.0	...	1000	277	7.1	+ 7.0	- 0.9				
	500	298	9.5	+ 8.3	- 4.6	...	750	271	3.9	+ 3.9	- 0.1				
100 m. above ground. Anemo-meter.	340	296	8.1	+ 7.3	- 3.5	...	500	247	7.2	+ 6.6	+ 2.8				
	250	290	10.0	+ 9.4	- 3.4	...	340	241	3.3	+ 2.9	+ 1.6				
Computed for M.S.L.	(at 13 h.)	321	11.9	+ 7.5	- 9.2	...	250	225	3.0	+ 2.1	+ 2.1	...	Lift 35 gms.		
Station near centre of anticyclone.								Lift 85 gms.							

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 33. April 16. 10 h. 19 m. to 11 h. 15 m. G.M.T.							ESKDALEMUIR. P. 34. April 17. 10 h. 29 m. to 10 h. 43 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direc-tion.	Velo-city.	Compo-nents.					Direc-tion.	Velo-city.	Compo-nents.				
				W.-E.	S.-N.						W.-E.	S.-N.			
	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
Greatest height.	7630	2095	The balloon was lost to view in haze.		
	7500	249	10.2	+ 9.5	+ 3.7	} 2.2	} 2.2		
	7000	236	7.1	+ 5.9	+ 4.0		
	6500	248	8.5	+ 3.2	+ 1.3		
	6000	217	4.2	+ 2.5	+ 3.3		
	5500	213	7.0	+ 3.8	+ 5.9		
	5000	188	4.9	+ 0.7	+ 4.8		
	4500	170	4.6	- 0.8	+ 4.5		
	4000	191	3.1	+ 0.6	+ 3.0		
	3500	270	1.2	+ 1.2	0.0		
	3000	279	5.3	+ 5.2	- 0.8		
	2500	267	7.0	+ 7.0	+ 0.4		
	2000	257	6.2	+ 6.0	+ 1.4		...	2000	181	4.8	+ 0.1	+ 4.8		...	
	1750	259	7.9	+ 7.7	+ 1.5		...	1750	145	20.3	- 11.5	+ 16.7		} 2.2	
	1500	277	5.6	+ 5.5	- 0.7		...	1500	149	15.4	- 8.0	+ 13.2			
	1250	338	1.1	+ 0.4	- 1.0		...	1250	155	15.7	- 6.7	+ 14.2			
	1000	351	0.6	+ 0.1	- 0.6		...	1000	153	10.9	- 4.9	+ 9.7			
	750	223	2.0	+ 1.4	+ 1.3		...	750	140	10.9	- 7.0	+ 8.3			
	500	199	4.2	+ 1.4	+ 4.0		...	500	126	7.0	- 5.6	+ 4.1			
100 m. above ground. Anemometer.	340	193	3.1	+ 0.7	+ 3.0	...	340	111	5.8	- 5.4	+ 2.1	...			
	250	180	3.0	0.0	+ 3.0	...	250	135	7.0	- 4.9	+ 4.9	...			
Computed for M.S.L. (at 13 h.)	180	4.9	0	+ 4.9	...	Lift 35 gms.	(at 13 h.)	167	18.5	- 4.2	+ 18.0	...	Lift 35 gms.		
ESKDALEMUIR. P. 35. April 18. 10 h. 14 m. to 10 h. 21 m. G.M.T.							ESKDALEMUIR. P. 36. April 19. 9 h. 46 m. to 10 h. 25 m. G.M.T.								
Greatest height.	1170	5500	Balloon lost in haze.		
	} 2.2	5000	204	5.6	+ 2.3	+ 5.1	} 2.2			
	...	...	...	...	...		4500	206	4.4	+ 1.9	+ 3.9
	...	...	...	...	...		4000	213	6.1	+ 3.3	+ 5.1
	...	...	...	...	...		3500	193	7.2	+ 1.6	+ 7.0
	...	...	...	...	...		3000	217	5.7	+ 3.4	+ 4.5
	...	...	...	...	...		2500	185	2.3	+ 0.2	+ 2.3
	...	...	...	...	...		2000	144	2.9	- 1.7	+ 2.3
	...	...	...	...	...		1750	150	2.8	- 1.4	+ 2.4
	...	...	...	...	...		1500	187	4.1	+ 0.5	+ 4.1
	...	...	...	...	...		1250	191	5.6	+ 1.1	+ 5.5
	1000	152	15.6	- 7.4	+ 13.7		...	1000	171	5.7	- 0.9		+ 5.6		
	750	146	8.9	- 5.0	+ 7.4		...	750	186	3.9	+ 0.4		+ 3.9		
	500	137	3.8	- 2.6	+ 2.8		...	500	172	2.9	- 0.4		+ 2.9		
100 m. above ground. Anemometer.	340	150	4.7	- 2.3	+ 4.0		...	340	156	3.2	- 1.3		+ 2.9	...	
	250	140	9.5	- 6.1	+ 7.3		...	250	140	4.1	- 2.6		+ 3.1	...	
Computed for M.S.L. (at 7 h.)	158	16.6	- 6.2	+ 15.4	...		Lift 36 gms.	Mean of 7 h. and 13 h.	195	10.1	+ 2.6		+ 9.8	...	Lift 35 gms.
ESKDALEMUIR. P. 37. April 20. 10 h. 28 m. to 10 h. 59 m. G.M.T.							ESKDALEMUIR. P. 38. April 21. 10 h. 13 m. to 10 h. 48 m. G.M.T.								
Greatest height.	5125	6055	Height calculated from observation of balloon tail to 1980 m. Rate of ascent then assumed to be 2.8 m/s. (mean value).
	} 2.7	5500	169	12.0	- 2.4	+ 11.8	} 2.8			
	5000	136	6.8	- 4.7	+ 4.9		5000	171	11.3	- 1.8	+ 11.2				
	4500	141	5.9	- 3.7	+ 4.5		4500	164	7.5	- 2.1	+ 7.2				
	4000	114	8.7	- 7.9	+ 3.6		4000	170	9.8	- 1.7	+ 9.6				
	3500	111	9.8	- 9.1	+ 3.5		3500	186	8.0	+ 0.9	+ 7.9				
	3000	126	9.2	- 7.4	+ 5.4		3000	207	7.3	+ 3.3	+ 6.5				
	2500	166	6.4	- 1.5	+ 6.2		2500	204	9.3	+ 3.8	+ 8.5				
	2000	168	2.9	- 0.6	+ 2.8		2000	205	6.1	+ 2.6	+ 5.5				
	1750	134	4.5	- 3.2	+ 3.1		1750	203	2.9	+ 1.1	+ 2.6				
	1500	125	7.4	- 6.1	+ 4.2		1500	212	4.4	+ 2.3	+ 3.7				
	1250	140	7.9	- 6.0	+ 5.1		1250	200	1.5	+ 0.5	+ 1.4				
	1000	122	5.3	- 4.5	+ 2.8		1000	223	3.4	+ 2.3	+ 2.5				
	750	119	3.8	- 3.3	+ 1.8		750	215	5.2	+ 3.0	+ 4.2				
	500	127	5.5	- 4.4	+ 3.3		500	210	5.0	+ 2.5	+ 4.3				
100 m. above ground. Anemometer.	340	122	5.9	- 5.0	+ 3.1		1.8	340	212	4.6	+ 2.4		+ 3.9	3.5	
	250	135	6.0	- 4.2	+ 4.2		1.8	250	210	4.0	+ 2.0		+ 3.5	3.5	
Computed for M.S.L.	Station near centre of anticyclone.						Lift 50 gms.	Station near centre of anticyclone.					Lift 42 gms.		

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 39. April 22. 12 h. to 12 h. 10 m. G.M.T.							ESKDALEMUIR. P. 40. April 28. 11 h. 4 m. to 11 h. 15 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres. } 1775	Degrees from N. } ...	m/s. } ...	m/s. } ...	m/s. } ...	Balloon receded at a small angle of elevation, and, encountering a strong wind overhead, was soon out of sight.	metres. } 1750	Degrees from N. } 241	m/s. } 1'1	m/s. } + 0'9	m/s. } + 0'5	Height obtained by observations of tail of balloon.		
	1500	216	18'6	+ 10'9	+ 15'0		1500	235	4'9	+ 4'0	+ 2'8		3'5	
	1250	214	17'5	+ 9'9	+ 14'4		1250	237	4'8	+ 4'0	+ 2'6		2'1	
	1000	218	14'5	+ 8'9	+ 11'4		1000	246	12'0	+ 10'9	+ 4'9		2'1	
	750	220	12'7	+ 8'2	+ 9'7		750	244	5'0	+ 4'5	+ 2'2		1'6	
	500	217	6'0	+ 3'6	+ 4'7		500	233	3'8	+ 3'1	+ 2'3		2'5	
100 m. above ground. Anemometer.	340	205	6'5	+ 2'8	+ 5'9	2'5	340	230	3'6	+ 2'7	+ 2'3	2'6		
	250	160	8'0	- 2'7	+ 7'5		250	225	5'2	+ 3'7	+ 3'7	2'6		
Computed for M.S.L. (at 13 h.)	240	11'6	+ 10'0	+ 5'8	...	Lift 71 gms.	Station in "Col." region.				Lift 50 gms.			

ESKDALEMUIR. P. 41. April 29. 10 h. 38 m. to 11 h. 4 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.			
				W.-E.	S.-N.		
Greatest height.	metres. } 2000	Degrees from N. } 242	m/s. } 4'2	m/s. } + 3'7	m/s. } + 2'0	Small balloon travelled in E.N.E. current until almost out of sight, then it encountered a current in opposite direction and returned almost overhead.	
	1750	260	3'9	+ 3'8	+ 0'7		
	1500	261	3'8	+ 3'8	+ 0'6		
	1250	235	1'9	+ 1'1	+ 1'5		
	1000	253	2'1	+ 2'0	+ 0'6		
	750	45	11'7	- 8'2	- 8'3		
100 m. above ground. Anemometer.	500	69	5'1	- 4'7	- 1'8	1'2	
	340	73	4'2	- 4'0	- 1'2		
	250	70	5'0	- 4'7	- 1'7		
Computed for M.S.L.		Station in "Col." region.				Lift 3 gms.	

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.		S.
2	Cu. to Cu.-Nb.	240	m/s. } 8'3	m/s. } + 7'2	m/s. } + 4'2	Base measured.
3	Cu.-Nb.	281	4'5	+ 4'4	- 0'9	Very diffuse, with stratiform film below.
7	St.-Cu.	260	1'9	+ 1'9	+ 0'3	
8	Cu.-Nb.	285	10'0	+ 9'7	- 2'6	Base measured.
10	Fr.-Cu.	222	20'0	+ 13'4	+ 14'8	Very small cloudlets, to fused sheet, faint and hazy.
11	Cu.	245	6'3	+ 5'7	+ 2'6	
14	Cu.	304	12'5	+ 10'4	- 7'0	
22	Ci.-Cu.	179	2'8	- 0'1	+ 2'8	
23	Fr.-Cu.	248	9'3	+ 8'6	+ 3'4	
24	St.-Cu.	294	6'3	+ 5'7	- 2'6	
25	Cu. to St.-Cu.	295	5'4	+ 4'9	- 2'3	St.-Cu. formed from apical parts of Cu.-Nb.
29	St.-Cu.	315	4'0	+ 2'8	- 2'8	A transition type.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H=5.5 m. Barometer, H_b=10.4 m.

Heights above Ground:—Thermometers, h_t=3.0 m. Rain-gauge, h_r=0.53 m. Sunshine Recorder, h_s=13.3 m. Cups of Anemometer, h_a=20 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (S, E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALEMUIR OBSERVATORY, DUMFRIESHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H=242.0 m. Barometer, H_b=237.3 m.

Heights above Ground:—Thermometers, h_t=0.9 m. Rain-gauge, h_r=0.38 m. Sunshine Recorder, h_s=1.5 m. Vane of Anemometer, h_a=15 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground, and a Remarks column.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and corresponding data for HOLYHEAD and DEERNESS. Includes sub-headers for S, N, W, E directions and V, Hrs, Min. for gusts.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and corresponding data for SCILLY and GREAT YARMOUTH. Includes sub-headers for S, N, W, E directions and V, Hrs, Min. for gusts.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. * No record. † Robinson Cup Anemometer; Arms 0.61 m.; Diameter of Cups 0.229 m.; Factor 2.2. ‡ Robinson Cup Anemometer; Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.8. § Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S, and 10 under W, indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.
Soundings by Kites (K.) and Pilot Balloons (P.).

BRIGHTON. K. 17. May 6. 10 h. 50 m. to 13 h. G.M.T.

Soundings with Kites.	Height above M.S.L.	Pressure.	Temperature.		Humidity.		Density.	Wind.		Cloud Observations and Remarks.
			Reading.	Fall per km.				Direction.	Velocity.	
Greatest height.	metres.	mb.	°A.	°C.	%.	mb.	mgm/cc.	Degrees from N.	m/s.	St., Al.-St. Lowest cloud 590 m. above ground. Gusty surface wind.
	785	917.3	277.5	5.3	65	5.5	1.149	270	12	
	500	949.9	279.0	8.8	80	7.5	1.182	260	9	
Ground level.	215	983.3	281.5	25.0	80	8.8	1.213	250	13	
	115	995.2	284.0	80	10.5	1.216	250	9		
Computed for M.S.L. (at 13 h.)	...	1008.0	...	...	...	...	...	251	20.4	...

BRIGHTON. K. 18. May 6. 15 h. to 15 h. 45 m. G.M.T.

Greatest height.	685	928.1	279.0	6.4	68	6.4	1.155	250	9	St., Al.-St. No clouds reached.
	215	982.5	282.0	22.0	80	9.2	1.209	250	9	
Ground level.	115	994.5	284.2	78	10.3	1.214	250	11		
Computed for M.S.L. (at 13 h.)	...	1008.0	...	...	...	...	...	251	20.4	...

BRIGHTON. K. 19. May 16. 14 h. 30 m. G.M.T.

Greatest height.	215	1000.2	284.5	55.0	43	5.8	1.222	60	?	Clear sky. Kite could not rise above 100 m.
Ground level.	115	1012.2	290.0	43	8.3	1.212	60	10		
Computed for M.S.L. (at 18 h.)	...	1026.0	...	...	...	...	...	70	13.2	...

BRIGHTON. K. 20. May 16. 17 h. to 17 h. 40 m.

Greatest height.	500	967.3	284.5	12.2	55	7.4	1.181	40	9	Clear sky.
	215	1000.8	288.0	3.0	52	8.8	1.207	30	9	
Ground level.	115	1012.7	288.3	52	9.0	1.220	50	9		
Computed for M.S.L. (at 18 h.)	...	1026.0	...	...	...	...	...	70	13.2	...

BRIGHTON. K. 21. May 17. 10 h. to 12 h.

Greatest height.	810	931.9	280.5	6.8	70	7.2	1.154	65	?	Wind very erratic at all altitudes, varying between 7 and 18 m/s. At 500 m. pull of kite varied between 10 and 50 lbs.
	500	967.6	282.6	13.6	65	7.8	1.189	60	?	
	215	1001.4	286.5	47.0	60	9.3	1.213	60	?	
Ground level.	115	1013.3	291.2	48	10.0	1.208	45	7.5		
Computed for M.S.L. (at 13 h.)	...	1027.5	78	9.1	...

BRIGHTON. K. 22. May 23. 10 h. 15 m. to 13 h.

Greatest height.	1345	860.6	281.0	6.5	80	8.6	1.063	290	13	Al.-Cu., Al.-St. Cu.-Nb. on N.W. horizon.
	500	953.2	286.5	5.3	70	10.8	1.154	280	9	
	215	986.0	288.0	15.0	80	13.5	1.186	260	9	
Ground level.	115	997.7	289.5	80	14.9	1.194	250	7		
Computed for M.S.L. (at 13 h.)	...	1012.0	300	6.7	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P).

ABERDEEN. P. 99. May 1. 7 h. 40 m. G.M.T.							ABERDEEN. P. 100. May 1. 11 h. 40 m. G.M.T.												
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.					
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.								
				W.-E.	S.-N.						W.-E.	S.-N.							
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Two theodolites used with base distance of 830 m. Balloon entered Cu. after passing thin condensation layer between 1200-1300 m. There was a very rapid rise just before balloon entered Cu. cloud. Above the Cu. was a sheet of St.-Cu. into which the Cu. apices merged. <i>Pressure Distribution</i> (13 h.). Anticyclonic centre. Low over N.W. Iceland.						
	2190	1540								
	2000	356	15.4	+1.2	-15.4	} 3.0	1420	356	7.5	+0.5	-7.5	3.7							
	1500	352	11.9	+1.7	-11.8		1250	348	5.2	+1.1	-5.1	2.2							
	1000	354	12.0	+1.2	-11.9		1000	338	5.8	+2.2	-5.4	2.1							
	500	360	10.4	+0.0	-10.4		500	348	6.2	+1.3	-6.0	2.2							
100 m. above ground.	114	350	5.9	+1.0	-5.0		114	343	6.8	+2.0	-6.5	1.7							
Anemometer.	46	315	2.0	+1.4	-1.4	46	315	3.0	+2.1	-2.1	...								
Computed for M.S.L.	(at 7 h.)	(at 13 h.)		Free lift 57 gms.					
ABERDEEN. P. 101. May 2. 7 h. 39 m. G.M.T.							ABERDEEN. P. 102. May 4. 8 h. 2 m. G.M.T.												
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Mist film general, but tending to disperse, revealing St.-Cu. and Alt.-Cu. Balloon lost in mist. Cu. observed by nephoscope at 13 h. gave components:— <table border="1" style="display: inline-table; vertical-align: middle;"><tr><th>W.-E.</th><th>S.-N.</th></tr><tr><td>+7.3</td><td>+3.9 (at 1000 m.).</td></tr><tr><td>+10.1</td><td>+5.5 (at 1400 m.).</td></tr></table> <i>Pressure Distribution</i> (7 h.). Low 1000 km. W. High belt over S. Europe.	W.-E.	S.-N.	+7.3	+3.9 (at 1000 m.).	+10.1	+5.5 (at 1400 m.).
W.-E.	S.-N.																		
+7.3	+3.9 (at 1000 m.).																		
+10.1	+5.5 (at 1400 m.).																		
	2010	1470							
	1900	271	8.2	+8.2	-0.1	} 3.0							
	1500	261	7.8	+7.7	+1.2		1250	286	12.3	+11.8	-3.3	...							
	1000	239	9.9	+8.4	+5.1		1000	270	15.1	+15.1	+0.1	...							
	500	195	20.0	+5.3	+19.2		500	261	10.1	+10.0	+1.6	...							
100 m. above ground.	114	196	9.3	+2.5	+8.7		114	228	6.4	+4.4	+4.0	...							
Anemometer.	46	200	6.9	+2.4	+6.5	46	225	1.0	+0.7	+0.7	...								
Computed for M.S.L.	(at 7 h.)	230	11.0	+8.4	+7.1	...	(at 7 h.)	180	5.2	0	+5.2	...	Free lift 70 gms.						
ABERDEEN. P. 103. May 5. 7 h. 52 m. G.M.T.							ABERDEEN. P. 104. May 6. 7 h. 47 m. G.M.T.												
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Clear atmosphere. Rapid rise on entering base of Cu. (large volume of cloud, but of diffuse structure). St.-Cu. also present. <i>Pressure Distribution</i> (7 h.). Extended Low over N. Europe. High S.W. Spain.						
	2190	1095							
	2000	239	1.2	+1.0	+0.6	} 3.0							
	1500	255	9.4	+9.0	+2.5						
	1000	263	15.5	+15.4	+1.8		1000	311	7.9	+6.0	-5.2	...							
	500	228	9.7	+7.1	+6.5		500	311	8.4	+6.3	-5.5	...							
100 m. above ground.	114	209	5.4	+2.5	+4.6		114	310	6.1	+4.7	-3.8	...							
Anemometer.	46	200	4.0	+1.4	+3.8	46	300	4.0	+3.5	-2.0	...								
Computed for M.S.L.	(at 7 h.)	218	6.5	+4.0	+5.1	...	(at 7 h.)		Free lift 54 gms.					
ABERDEEN. P. 105. May 7. 7 h. 50 m. G.M.T.							ABERDEEN. P. 106. May 11. 7 h. 50 m. G.M.T.												
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Generally overcast, but clear to N.W. Cu.-Nb. on horizon; also a film of cloud which became St.-Cu. above, in which balloon gradually disappeared. <i>Pressure Distribution</i> (7 h.). Relatively low-pressure belt over British Isles, with well-defined Low over N. Russia.						
	1680	2640							
	} 2.5	2500	260	8.1	+8.0	+1.4	...							
		2000	230	5.2	+4.0	+3.4	...							
	1500	128	3.6	-2.8	+2.2		1500	306	4.8	+3.9	-2.8	...							
	1000	135	2.8	-2.0	+2.0		1000	311	8.0	+6.0	-5.3	...							
	500	88	2.6	-2.6	-0.1		500	292	8.2	+7.6	-3.1	...							
100 m. above ground.	114	72	2.2	-2.4	-0.8	114	284	4.9	+4.6	-1.2	...								
Anemometer.	46	...	0	0	0	46	293	2.5	+2.3	-1.0	...								
Computed for M.S.L.	(at 7 h.)	(at 7 h.)		Free lift 54 gms.					

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.

Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 107. May 12. 8 h. 5 m. G.M.T.								ABERDEEN. P. 108. May 13. 7 h. 48 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direc-tion.	Velo-city.	Compo-nents.					Direc-tion.	Velo-city.	Compo-nents.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres. } 1248	Degrees from N.	m/s.	m/s.	m/s.	m/s.	900	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Dull and gloomy, with great visibility. Low cloud resembling Nb. No rain falling at time of ascent. Balloon lost in Nb.		
	1000	295	11.9	+10.8	-5.0	2.9	750	292	9.4	+8.7	-3.5	2.9			
	500	307	17.7	+14.1	-10.6		500	300	9.7	+8.4	-4.8			Pressure Distribution (7 h.).	
100 m. above ground. Anemometer.	114	312	9.5	+7.2	-6.3		114	302	11.0	+9.2	-5.7				High belt from France to W. Atlantic. Low 1200 km. N.E.
	46	300	12.0	+10.4	-6.0		46	300	6.0	+5.2	-3.0				
Computed for M.S.L.	(at 7 h.)	327	12.3	+6.7	-10.3		...	(at 7 h.)	306	9.0	+7.3		-5.3	...	Free lift 52 gms.
ABERDEEN. P. 109. May 14. 7 h. 44 m. G.M.T.								ABERDEEN. P. 110. May 15. 7 h. 47 m. G.M.T.							
Greatest height.	metres. } 1650	Degrees from N.	m/s.	m/s.	m/s.	m/s.	2290	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Overcast with St.-Cu., but no low clouds. From nephoscope observations immediately after ascent resultant velocity of St.-Cu. = 8.6 m/s. Direction 264° (for 2300 m.). Balloon lost in St.-Cu.		
	1500	238	7.6	+6.5	+4.0	2.7	2000	268	7.8	+7.8	+0.3	2.9			
	1000	248	5.1	+4.7	+1.9		1500	285	3.5	+3.4	-0.9			Pressure Distribution (7 h.).	
100 m. above ground. Anemometer.	114	174	1.0	-0.1	+1.1		1000	285	3.8	+3.7	-1.0				High pressure belt over British Isles and Germany.
	46	...	0	0	0		500	346	7.4	+1.8	-7.2				
Computed for M.S.L.	(at 7 h.)	312	8.3	+6.2	-5.6		...	(at 7 h.)	...	...	...		...	...	Free lift 52 gms.
ABERDEEN. P. 111. May 18. 7 h. 47 m. G.M.T.								ABERDEEN. P. 112. May 19. 7 h. 48 m. G.M.T.							
Greatest height.	metres. } 4730	Degrees from N.	m/s.	m/s.	m/s.	m/s.	2055	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Moderately clear. Sheet of thin Alto.-St. above; St.-Cu. below; degrading later in day. Between 1800-1900 m. balloon passed through a cloud film and was finally lost in St.-Cu.		
	4500	278	15.7	+15.6	-2.1	2.7	...	...	...	...	...	2.7			
	4000	279	15.6	+15.4	-2.5		2000	277	16.1	+16.0	-1.9			Pressure Distribution (7 h.).	
100 m. above ground. Anemometer.	114	202	2.8	+1.2	+2.7		1500	239	8.9	+7.6	+4.6				High S.W. Ireland, influencing N.W. Europe.
	46	170	3.0	-0.5	+2.9		1000	271	9.1	+9.1	-0.1				
Computed for M.S.L.	(at 7 h.)	251	12.9	+12.2	+4.2		...	(at 7 h.)	329	9.7	+5.0		-8.3	...	Free lift 48 gms.
ABERDEEN. P. 113. May 21. 7 h. 45 m. G.M.T.								ABERDEEN. P. 114. May 22. 7 h. 46 m. G.M.T.							
Greatest height.	metres. } 2380	Degrees from N.	m/s.	m/s.	m/s.	m/s.	3720	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Clear; slight haze on horizon, with Ci.-Cu. to A.-Cu. Clouds formed at different levels and sky became overcast. Radiating bands of Ci.-Cu. to A.-Cu. present. Radiant point=S.W. Nephoscope observations at 13 h. gave components W.-E. +18.5; S.-N. +12.6 (at 3700 m.).		
	2000	236	25.6	+21.3	+14.1	2.8	3500	234	28.6	+23.2	+16.8	2.8			
	1500	243	16.5	+14.6	+7.5		3000	238	25.0	+21.2	+13.1			Pressure Distribution (7 h.).	
100 m. above ground. Anemometer.	114	190	7.7	+1.3	+7.6		2500	243	12.3	+11.0	+5.6				Irregular high pressure over W. Europe.
	46	180	5.0	0	+5.0		2000	250	10.6	+10.0	+3.6				
Computed for M.S.L.	(at 7 h.)	240	12.7	+11.0	+6.4		...	(at 7 h.)	245	8.0	+7.3		+3.4	...	Free lift 52 gms.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.—*continued.*
Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 115. May 25. 7 h. 46 m. G.M.T.							ABERDEEN. P. 116. May 27. 7 h. 51 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.		
		Direction.	Velocity.	Components.				Direction.	Velocity.	Components.				
				W.-E.						S.-N.			W.-E.	S.-N.
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	8490	...	...	...	...	...	2470	...	...	...	...	...
	8400	312	10.3	+6.8	-7.7	...	...	...	...	...	...	...
	8000	316	12.7	+8.8	-9.2	...	...	...	...	...	...	...
	7500	309	12.2	+9.5	-7.6	...	...	...	...	...	...	...
	7000	299	8.2	+7.1	-4.0	...	...	...	...	...	...	...
	6500	300	7.8	+6.7	-3.9	...	...	...	...	...	...	...
	6000	312	6.9	+5.1	-4.6	...	...	...	...	...	...	...
	5500	320	3.1	+2.0	-2.4	...	...	...	...	...	...	...
	5000	310	4.9	+3.7	-3.1	...	...	...	...	...	...	...
	4500	324	5.4	+3.2	-4.4	...	...	...	...	...	...	...
	4000	337	4.4	+1.7	-4.0	3.0	...	...	...	...	...	...
	3500	49	2.5	-1.9	-1.7	...	...	...	...	...	...	...
	3000	3	8.8	-0.5	-8.8	...	...	...	...	...	...	...
	2500	77	2.7	-2.6	-0.6	...	...	...	...	...	...	...
	2000	90	3.6	-3.6	0	...	...	...	...	...	...	...
	1500	182	6.1	+0.2	+6.1	...	2000	332	11.0	+5.2	-9.7	...		
	1000	210	7.1	+3.5	+6.1	...	1500	322	8.8	+5.4	-7.0	...		
	500	264	3.0	+3.0	+0.3	...	1000	313	6.0	+4.4	-4.1	...		
100 m. above ground. Anemometer.	114	266	4.6	+4.3	+0.3	...	500	315	2.3	+1.6	-1.6	...		
	46	270	1.0	+1.0	0	...	114	193	1.9	-1.8	+0.1	...		
	46	270	1.0	+1.0	0	...	46	90	2.0	-2.0	0	...		
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 7 h.)	...	...	...	...	...
						Free lift 60 gms.						Free lift 54 gms.		
ABERDEEN. P. 117. May 28. 7 h. 50 m. G.M.T.							ABERDEEN. P. 118. May 29. 7 h. 47 m. G.M.T.							
Greatest height.	4065	...	...	...	...	...	1375	...	...	...	...	...
	4000	263	8.8	+8.7	+1.1	...	...	...	...	...	...	...
	3500	216	7.6	+4.5	+6.1	...	...	...	...	...	...	...
	3000	230	6.9	+5.3	+4.4	...	...	...	...	...	...	...
	2500	231	4.3	+4.1	+1.4	...	...	...	...	...	...	...
	2000	288	3.0	+2.8	-0.9	...	...	...	...	...	...	...
	1500	225	1.9	+1.3	+1.3	2.8	1250	277	6.1	+6.0	-0.7	...		
	1000	291	1.7	+1.6	-0.6	...	1000	258	6.3	+6.1	+1.3	...		
	500	253	1.4	+1.3	+0.4	...	500	233	8.7	+6.9	+5.3	...		
100 m. above ground. Anemometer.	114	135	0.7	-0.5	+0.5	...	114	210	9.0	+4.5	+7.8	...		
	46	...	0	0	0	...	46	210	6.0	+3.0	+5.2	...		
Computed for M.S.L.	(at 7 h.)	247	5.3	+4.9	+2.1	...	(at 7 h.)	241	14.4	+12.6	+7.0	...		
						Free lift 49 gms.						Free lift 55 gms.		
ABERDEEN. P. 119. May 30. 7 h. 48 m. G.M.T.							ESKDALEMUIR. P. 42. May 2. 10 h. 19 m. G.M.T.							
Greatest height.	1885	...	...	...	...	...	1075	...	...	...	...	...
	1830	242	8.0	+7.1	+3.8	...	...	...	...	...	...	...
	1500	283	4.3	+4.2	-1.0	...	1000	173	4.7	-0.6	+4.7	...		
	1000	293	10.6	+9.7	-4.2	...	750	204	5.2	+2.1	+4.7	...		
	500	311	10.2	+7.7	-6.6	2.9	500	202	2.9	+1.1	+2.7	...		
100 m. above ground. Anemometer.	114	308	7.6	+5.9	-4.7	...	340	196	4.6	+1.3	+4.4	...		
	46	315	4.9	+3.5	-3.5	...	250	195	5.0	+1.3	+4.8	...		
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 13 h.)	211	9.0	+4.6	+7.7	...
						Free lift 53 gms.						Free lift 5 gms.		
ESKDALEMUIR. P. 43. May 7. 7 h. 11 m. G.M.T.							ESKDALEMUIR. P. 44. May 7. 18 h. 9 m. G.M.T.							
Greatest height.	1040	...	...	...	...	...	925	...	...	...	...	...
	750	86	5.4	-5.4	-0.4	...	750	320	5.6	+3.6	-4.3	...		
	500	71	5.4	-5.1	-1.8	1.5	500	326	2.6	+1.4	-2.2	...		
100 m. above ground. Anemometer.	340	57	5.5	-4.6	-3.0	...	340	318	7.2	+4.8	-5.4	...		
	250	40	4.1	-2.6	-3.1	...	250	310	4.1	+3.1	-2.6	...		
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 18 h.)	...	...	...	...	...
						Free lift 6 gms.						Free lift 5.5 gms.		

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.
Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 45. May 12. 12 h. 44 m. G.M.T.							ESKDALEMUIR. P. 46. May 14. 11 h. 43 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	1100	3300	Height calculated from observations of balloon tail (= 5 m.) up to 2245 m. Afterwards rate of ascent assumed to be 130 m/min. Final altitude = 23°. Balloon lost in distance.	
	3000	320	6.0	+ 3.8	- 4.6	...	Pressure Distribution (13 h.). High belt over Ireland and extending W. Low N. Iceland.	
	...	...	...	...	...	...	2500	319	5.3	+ 3.5	- 4.0	1.9
	...	...	...	...	...	...	2000	317	5.8	+ 3.9	- 4.2	...
	...	...	...	...	...	...	1750	336	5.4	+ 2.2	- 5.0	2.3
	...	...	...	...	...	...	1500	322	6.1	+ 3.7	- 4.8	2.1
	...	...	...	...	...	...	1250	311	5.1	+ 3.8	- 3.3	2.3
	1000	266	6.1	+ 6.1	+ 0.4	1.5	1000	285	5.3	+ 5.1	- 1.4	2.7		Pressure Distribution (13 h.).
	750	248	4.9	+ 4.5	+ 1.8	...	750	263	6.0	+ 5.9	+ 0.7	2.2		Irregular high pressure over N. W. Europe. Low N. Iceland.
	500	255	3.1	+ 3.0	+ 0.8	...	500	262	6.5	+ 6.4	+ 0.9	2.0		
100 m. above ground. Anemometer.	340	271	4.8	+ 4.8	- 0.1	...	340	263	5.9	+ 5.8	+ 0.7	1.9		
	250	270	5.0	+ 5.0	0	...	250	260	6.5	+ 6.4	+ 1.1	1.9		
Computed for M.S.L.	(at 13 h.)	324	10.2	+ 6.0	- 8.3	...	(at 13 h.)	Free lift ?	
ESKDALEMUIR. P. 47. May 15. 11 h. 25 m. G.M.T.							ESKDALEMUIR. P. 48. May 18. 12 h. 25 m. G.M.T.							
Greatest height.	3200	2150	Lost in distance at elevation 13°.	
	3000	279	4.9	+ 4.8	- 0.8	3.9	Pressure Distribution (13 h.). Station in high pressure wedge. Low over N. Iceland.	
	2500	315	3.3	+ 2.3	- 2.3	4.6	2000	279	7.4	+ 7.3	- 1.1	...		
	2000	15	1.2	- 0.3	- 1.1	3.3	1750	276	6.0	+ 6.0	- 0.6	...		
	1750	63	0.9	- 0.8	- 0.4	2.7	1500	278	6.6	+ 6.5	- 0.9	...		
	1500	25	1.7	- 0.7	- 1.5	2.6	1250	275	8.0	+ 8.0	- 0.7	...		
	1250	39	2.6	- 1.6	- 2.0	1.8	1000	265	4.9	+ 4.9	+ 0.4	1.5		
	1000	20	3.5	- 1.2	- 3.3	1.7	750	257	6.2	+ 6.0	+ 1.4	...		
	750	14	4.7	- 1.1	- 4.5	2.3	500	267	3.4	+ 3.4	+ 0.2	...		
	500	32	4.0	- 2.1	- 3.4	2.3	340	254	3.5	+ 3.4	+ 1.0	...		
100 m. above ground. Anemometer.	340	45	4.1	- 2.9	- 2.9	2.4	250	270	4.5	+ 4.5	0	...		
	250	20	4.0	- 1.4	- 3.8	...								
Computed for M.S.L.	(at 13 h.)	(at 13 h.)	Free lift 6 gms.	
ESKDALEMUIR. P. 49. May 26. 11 h. 22 m. G.M.T.							FALMOUTH. P. 62. May 27. 11 h. 0 m. G.M.T.							
Greatest height.	1940	1745	Bright. No cloud, but hazy towards noon. Moderate temperature.	
	1750	32	3.2	- 1.7	- 2.7	...	1700	33	5.4	- 2.9	- 4.5	...	Pressure Distribution (13 h.). High pressure ridge over British Isles. High centre 250 km. N. W.	
	1500	73	1.7	- 1.6	- 0.5	...	1500	27	3.1	- 1.4	- 2.8	...		
	1250	62	1.7	- 1.5	- 0.8	...	1250	14	7.5	- 1.8	- 7.3	...		
	1000	348	1.9	+ 0.4	- 1.9	...	1000	19	6.9	- 2.2	- 6.5	...		
	750	232	1.1	+ 0.9	+ 0.7	...	750	22	4.9	- 1.8	- 4.5	2.0		
	500	13	2.6	- 0.6	- 2.5	1.8	500	53	2.7	- 2.1	- 1.6	...		
100 m. above ground. Anemometer.	340	0	2.5	0	- 2.5	...	163	83	2.3	- 2.3	- 0.3	...		
	250	45	1.6	- 1.1	- 1.1	...	63	114	3.0	- 2.7	+ 1.2	...		
Computed for M.S.L.	(at 13 h.)	(at 13 h.)	45	8.7	- 6.2	- 6.2	...		Wt. of balloon 12.3 gms. Free lift 23.4 gms.
SOUTH FARNBOROUGH. P. 54. May 1. 6 h. 55 m. G.M.T.							SOUTH FARNBOROUGH. P. 55. May 5. 11 h. 25 m. G.M.T.							
Greatest height.	4270	1790	Clear. Cu. ₅ with little Ci., but becoming overcast, showery, and squally. Balloon lost in cloud.	
	4200	332	7.2	+ 3.3	- 6.3	Pressure Distribution (13 h.). Low 800 km. N.W. separating Highs N. of Iceland and W. of Spain. Secondary Low N. of Russia.	
	4000	330	7.5	+ 3.7	- 6.5	...	...	...	...	...	...	...
	3500	322	7.3	+ 4.5	- 5.7	...	...	...	...	...	...	...
	3000	334	8.4	+ 3.7	- 7.5	...	...	...	...	...	...	...
	2500	330	8.5	+ 4.2	- 7.4	...	...	...	...	...	...	...
	2000	360	8.4	0.0	- 8.4	...	...	...	...	...	...	...
	1750	35	9.2	- 5.3	- 7.5	2.4	...	...	...	...	...	...
	1500	45	13.4	- 9.5	- 9.4	...	1720	257	13.5	+ 13.2	+ 3.0	...		
	1250	53	20.6	- 16.5	- 12.3	...	1500	257	15.1	+ 14.7	+ 3.5	...		
	1000	53	21.0	- 16.8	- 12.6	...	1250	259	15.2	+ 14.9	+ 2.8	...		
	750	60	13.8	- 11.9	- 7.0	...	1000	259	14.0	+ 13.8	+ 2.6	...		
	500	55	9.1	- 7.5	- 5.2	...	750	251	13.9	+ 13.1	+ 4.6	...		
	185	?	?	?	?	...	500	241	14.8	+ 12.9	+ 7.1	...		
	105	45	8.0	- 5.7	- 5.7	...	185	242	7.8	+ 6.9	+ 3.7	...		
						...	105	248	9.0	+ 8.3	+ 3.4	...		
Computed for M.S.L.	(at 7 h.)	54	11.6	- 9.4	- 6.8	...	(at 13 h.)	262	17.5	+ 17.3	+ 2.4	

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 57. May 8. 6 h. 55 m. G.M.T.							SOUTH FARNBOROUGH. P. 58. May 13. 6 h. 45 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direc- tion.	Velo- city.	Components.					Direc- tion.	Velo- city.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	Metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	4200	...	...	...	...	...	2355	...	...	...	...	...	Clear. St. ₁₀ in which balloon was lost.
	4000	251	23°0	+21°8	+7°4	2'4	...	...	...	...	...	...	A high belt stretched across N. of France. Shallow Low 1600 km. to NE. also Lows S. of Russia and N. of Iceland.
	3500	256	23°2	+22°5	+5°7	
	3000	260	17°6	+17°3	+3°2	
	2500	268	15°1	+15°1	+0°6		...	2285	303	15°0	+12°5	-8°3		...
	2000	273	13°5	+13°5	-0°6		...	2000	298	13°6	+12°0	-6°4		...
	1750	275	13°5	+13°4	-1°2		...	1750	280	11°4	+11°2	-2°0		...
	1500	267	14°8	+14°8	+0°7		...	1500	281	11°1	+10°9	-2°1		...
	1250	268	14°7	+14°7	+0°5		...	1250	290	12°4	+11°7	-4°2		...
	1000	267	16°0	+16°0	+0°7		...	1000	295	13°1	+11°9	-5°5		...
	750	266	16°1	+16°1	+1°0		...	750	299	11°0	+9°6	-5°3		...
	500	261	13°4	+13°2	+2°1		...	500	292	10°8	+10°0	-4°1		...
	185	240	8°6	+7°4	+4°3		...	185	268	7°7	+7°7	+0°3		...
	105	?	?	?	?	...	105	260	4°5	+4°4	+0°8	...		
Computed for M.S.L.	(at 7 h.)	275	14°6	+14°6	-1°3	...	(at 7 h.)	286	14°6	+14°1	-4°1	...	...
SOUTH FARNBOROUGH. P. 59. May 14. 6 h. 42 m. G.M.T.							SOUTH FARNBOROUGH. P. 60. May 15. 9 h. 35 m. G.M.T.							
Greatest height.	2785	...	...	...	...	2'4	Slight haze. Cloudless at first, but Ci. ₁ gradually developed, changing into Ci.-Cu. Balloon burst.	935	...	...	...	...	Hazy. Fr.-Cu. ₄ in which balloon disappeared. Balloon rose almost vertically for nearly a minute.
	2715	3	12°3	-0°7	-12°3		...	...	...	...	...	...	...
	2500	4	12°7	-1°0	-12°7		...	...	...	...	...	...	...
	2000	355	8°1	+0°7	-8°1		...	...	...	...	...	...	...
	1750	6	6°3	-0°7	-6°2		...	...	...	...	...	...	...
	1500	18	6°9	-2°1	-6°5		...	...	...	...	...	...	...
	1250	15	3°4	-0°9	-3°3		...	...	...	...	...	...	...
	1000	42	3°1	-2°1	-2°3		...	...	...	...	...	...	...
	750	55	3°2	-2°6	-1°8		...	...	...	...	...	...	...
	500	360	0°8	0°0	-0°8		...	...	...	...	...	...	...
	185	308	2°3	+1°8	-1°4		...	...	...	...	...	...	...
	105	...	0	0	0		...	...	...	...	...	...	...
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 7 h.)	...	...	...	...	...	...
SOUTH FARNBOROUGH. P. 61. May 16. 9 h. 15 m. G.M.T.							SOUTH FARNBOROUGH. P. 62. May 18. 12 h. 35 m. G.M.T.							
Greatest height.	2355	...	...	...	...	2'4	Hazy, but cloudless. Balloon lost in haze.	4630	...	...	...	...	Clear and cloudless. Balloon lost in distance.
	
	
	
	
	2285	73	13°3	-12°7	-3°9		...	...	...	...	...	...	...
	2000	74	13°4	-12°8	-3°7		...	...	...	...	...	...	...
	1750	82	12°6	-12°5	-1°8		...	...	...	...	...	...	...
	1500	80	13°2	-13°0	-2°2		...	...	...	...	...	...	...
	1250	84	12°1	-12°0	-1°3		...	...	...	...	...	...	...
	1000	87	12°5	-12°5	-0°6		...	...	...	...	...	...	...
	750	89	10°8	-10°8	-0°2		...	...	...	...	...	...	...
	500	71	7°9	-7°4	-2°5	...	...	...	...	...	...	...
	185	46	6°2	-4°5	-4°3	...	...	...	...	...	...	...
	105	45	4°0	-2°8	-2°8	...	...	...	...	...	...	...
Computed for M.S.L.	(at 7 h.)	107	14°5	-13°9	+4°2	...	(at 13 h.)	52	7°7	-6°1	-4°7	...	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.

Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 63. May 19. 7 h. 0 m. G.M.T.							SOUTH FARNBOROUGH. P. 64. May 20. 6 h. 50 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direc-tion.	Velo-city.	Components.					Direc-tion.	Velo-city.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
Greatest height.	4060	...	...	...	...	} 2'4 Hazy, but cloudless. Balloon lost in haze. Pressure Distribution (7 h.). Anticyclone 1400 km. W.S.W. and high generally over Europe. Low over N. Norway.	1645	...	...	...	...	} 2'4 Rather hazy, but cloudless. Very light westerly surface wind. Pressure Distribution (7 h.). High pressure belt over W. Europe and Atlantic. Low over N. Finland.		
	4000	40	8'0	-5'2	-6'1			...	...	...	...		...
	3500	47	7'3	-5'3	-5'0			...	...	...	...		...
	3000	23	5'4	-2'1	-5'0			...	...	...	...		...
	2500	18	3'8	-1'2	-3'6			...	...	...	...		...
	2000	35	5'6	-3'2	-4'6			...	...	...	...		...
	1750	13	4'8	-1'1	-4'7			...	...	...	...		...
	1500	32	4'5	-2'4	-3'8			1500	304	5'0	+4'2		-2'8	
	1250	38	3'9	-2'4	-3'1			1250	336	2'8	+1'1		-2'5	
	1000	37	3'9	-2'3	-3'1			1000	360	2'7	0'0		-2'7	
	750	13	4'8	-1'1	-4'6			750	49	1'1	-0'8		-0'7	
	500	351	3'7	+0'6	-3'7			500	145	1'3	-0'7		+1'0	
	185	352	3'1	+0'4	-3'0			185	?	?	?		?	
	105	...	0	0	0		105	...	0	0	0			
Computed for M.S.L.	(at 7 h.)	38	8'4	-5'2	-6'6	...	(at 7 h.)	65	5'8	-4'7	-3'3	...		
SOUTH FARNBOROUGH. P. 65. May 21. 6 h. 45 m. G.M.T.							SOUTH FARNBOROUGH. P. 66. May 21. 10 h. 35 m. G.M.T.							
Greatest height.	1645	...	...	...	...	} 2'4 Clear and cloudless. Balloon lost in sun glare. Pressure Distribution (7 h.). High pressure belt over Europe. Low over S. Iceland and Black Sea.	3635	...	...	...	...	} 2'4 Clear and cloudless. Slight trouble experienced from factory smoke. Balloon lost in distance and smoke. Pressure Distribution (13 h.). High pressure belt over Europe. Low over S. Iceland and Black Sea.		
	...	...	...	...	...			3500	272	11'6	+11'6		-0'4	
	...	...	...	...	...			3000	272	12'1	+12'1		-0'5	
	...	...	...	...	...			2500	272	9'5	+9'5		-0'3	
	...	...	...	...	...			2000	269	10'3	+10'3		+0'2	
	1500	267	7'5	+7'5	+0'4			1750	262	10'3	+10'2		+1'5	
	1250	271	7'9	+7'9	-0'1			1500	258	8'9	+8'7		+1'8	
	1000	277	8'7	+8'7	-1'0			1250	255	5'8	+5'6		+1'5	
	750	262	5'2	+5'1	+0'7			1000	245	5'6	+5'1		+2'4	
	500	229	4'2	+3'2	+2'8			750	257	5'6	+5'4		+1'3	
	185	295	1'3	+1'2	-0'5			500	254	4'4	+4'2		+1'2	
	105	...	0	0	0			185	232	5'0	+3'9		+3'1	
	...	...	0	0	0			105	235	3'0	+2'1		+2'1	
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 13 h.)	...	...	...	...	...
SOUTH FARNBOROUGH. P. 67. May 26. 7 h. 10 m. G.M.T.							SOUTH FARNBOROUGH. P. 67A. May 26. 16 h. 0 m. G.M.T.							
Greatest height.	4485	...	...	...	...	} 2'4 Clear. Al.-St. ₇ at first, clearing to Al.-St. ₂ . Pressure Distribution (7 h.). Irregular High over British Isles. Low 1100 km. S.S.E. and to N.W. of Iceland.	2855	...	...	...	...	} 2'4 Clear. Al.-Cu. ₇ in which balloon disappeared. Pressure Distribution (18 h.). Irregular High over British Isles and Europe generally. Low over N. Iceland.		
	4415	2	4'7	-0'2	-4'7			...	...	...	...		...
	4000	11	6'0	-1'1	-5'9			...	...	...	...		...
	3500	26	10'2	-4'4	-9'2			...	...	...	...		...
	3000	23	10'6	-4'1	-9'7			2785	15	10'3	-2'6		-10'0	
	2500	23	11'7	-4'5	-10'8			2500	16	11'5	-3'2		-11'0	
	2000	27	11'5	-5'3	-10'2			2000	18	8'6	-2'6		-8'2	
	1750	32	10'8	-5'8	-9'1			1750	15	9'6	-2'5		-9'2	
	1500	42	12'1	-8'1	-8'9			1500	19	17'2	-5'7		-16'2	
	1250	38	9'8	-6'0	-7'8			1250	15	14'2	-3'8		-13'7	
	1000	34	11'9	-6'7	-9'8			1000	20	16'0	-5'5		-15'0	
	750	34	12'4	-6'9	-10'3			750	20	12'7	-4'4		-11'9	
	500	30	9'7	-4'8	-8'4			500	22	11'1	-4'2		-10'3	
	185	10	3'3	-0'6	-3'2		185	23	9'5	-3'7	-8'7			
	105	23	5'0	-2'0	-4'6		105	34	5'0	-2'8	-4'1			
Computed for M.S.L.	(at 7 h.)	20	14'2	-4'9	-13'3	...	(at 18 h.)	36	8'8	-5'2	-7'2	...		

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 68. May 27. 7 h. 0 m. G.M.T.							SOUTH FARNBOROUGH. P. 69. May 28. 6 h. 40 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.		
		Direction.	Velocity.	Components.				Direction.	Velocity.	Components.				
				W.-E.						S.-N.			W.-E.	S.-N.
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	3635	2925		
	3500	39	9.8	-6.1	-7.6	} 2.4 Clear and cloudless. Balloon lost in distance. Pressure Distribution (7 h.). Irregular High over British Isles. Low over N. Iceland.	2855	354	9.5	+1.0	-9.5	} 2.4 Hazy. Ci.-St ₁ . Azimuth pen failed during first 2 minutes. Balloon lost in distant haze. Pressure Distribution (7 h.). High ridge from England to Scandinavia, being extension of Atlantic High. Low over Iceland.		
	3000	42	14.6	-9.8	-10.8		2500	344	9.1	+2.5	-8.7			
	2500	38	11.4	-6.9	-9.0		2000	344	7.1	+2.0	-6.8			
	2000	45	12.6	-8.9	-8.9		1750	344	8.5	+2.3	-8.2			
	1750	42	14.6	-9.7	-10.8		1500	331	9.9	+4.8	-8.7			
	1500	31	15.0	-9.8	-11.3		1250	326	8.0	+4.5	-6.6			
	1250	39	13.1	-8.3	-10.1		1000	328	7.6	+4.0	-6.5			
	1000	36	13.3	-7.8	-10.7		750	325	7.3	+4.2	-6.0			
	750	29	12.4	-5.9	-10.8		500	321	8.1	+5.1	-6.2			
	500	25	10.0	+4.2	-9.1		185	323	4.1	+2.5	-3.3			
	185	350	4.0	+0.7	-3.9		105	...	0	0	0			
	105	11	5.0	-0.7	-4.9									
Computed for M.S.L.	(at 7 h.)	20	13.3	-4.6	-12.5		...	(at 7 h.)	340	5.7	+1.9		-5.3	...

SOUTH FARNBOROUGH. P. 70. May 29. 15 h. 15 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.			
				W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	
	2075	} 2.4 Clear. Ci. ₆ and St. Balloon passed through cloud once or twice before disappearing. Pressure Distribution (18 h.). Relatively low V. depression 400 km. N.N.E., in an otherwise high ridge over N. Europe. Well-defined Low over N. Iceland (2000 km. N.N.W.).	
	2000	61	3.8	-3.3	-1.8		
	1750	57	1.3	-1.1	-0.7		
	1500	72	0.8	-0.8	-0.3		
	1250	360	0.1	0.0	-0.1		
	1000	325	1.3	+0.7	-1.0		
	750	326	3.8	+2.1	-3.1		
	500	321	4.0	+2.5	-3.1		
	185	300	3.5	+3.0	-1.8		
	105	349	2.0	+0.4	-2.0		
Computed for M.S.L.	(at 18 h.)	292	9.8	+9.1	-3.7		...

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.		S.
4	Cu.	242	m/s.	m/s.	m/s.	Apical portions measured. Cu. changing into Cu.-Nb. Degraded cloud. Sheet of Cirro-Nebula forming above from W.S.W. ⊕ Observation at 12 h. Direction mean of two readings 230° and 220°. St.-Cu. of lenticular form. Cu.-Nb. below. Cloud alternately fusing and opening.
5	Cu. to Cu.-Nb.	234	8.3	+7.3	+3.9	
6	Cu.	274	1.2	+1.0	+0.7	
7	Fr.-St.	95	3.1	+3.0	-0.3	
11	Cu.-Nb.	327	10.0	-10.0	+0.9	
12	Cu.	250	2.5	+1.3	-2.1	
15	A.-Cu. to St.-Cu.	238	2.4	+2.3	+0.8	
16	St.-Cu.	225	4.2	+3.6	+2.2	
18	St.-Cu.	237	2.1	+1.5	+1.5	
22	Ci.-Cu. to A.-Cu.	236	1.8	+1.5	+1.0	
23	St.-Cu.	355	6.0	+5.0	+3.4	
26	Cu. to Cu.-Nb.	315	2.5	+0.2	-2.5	
30	Cu.	275	4.6	+3.3	-3.3	
			5.4	+5.4	-0.5	

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level :—Station, H = 5.5 m. Barometer, H_b = 10.4 m.

Heights above Ground :—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Sunshine Recorder, h_s = 13.3 m. Cups of Anemometer, h_a = 20 m.

Table with columns: Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 10 h., Sunshine, Solar Radiation, Milliwatts per cm², Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALEMUIR OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level :—Station, H = 242.0 m. Barometer, H_b = 237.3 m.

Heights above Ground :—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Sunshine Recorder, h_s = 1.5 m. Vane of Anemometer, h_a = 15 m.

Table with columns: Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 10 h., Sunshine, Solar Radiation, Milliwatts per cm², Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground (Daily Mean, Extremes), REMARKS.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and Date, 3 h., 9 h., 15 h., 21 h., Vel. in Max. Hourly Run, Time of Max. Sub-headers include HOLYHEAD and DEERNESS with specific height information.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust (Gorleston.), Time of Gust. Sub-headers include SCILLY and GREAT YARMOUTH with specific height information.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. * No record. † Robinson Cup Anemometer; Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.8. ‡ Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S, and 10 under W, indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.

Soundings by Kites (K.) and Pilot Balloons (P.).

BRIGHTON. K. 23. June 14. 9 h. 50 m. to 11 h. 30 m. G.M.T.

Soundings with Kites.	Height above M.S.L.	Pressure.	Temperature.		Humidity.		Density of Atmosphere.	Wind.		Cloud Observations and Remarks.	
			Reading.	Fall per km.				Direction.	Velocity.		
Greatest height.	metres. 500	mb. 955.6	°A. 289	°C. 7.0	% 80	mb. 14.6	mgm/cc. 1.145	Degrees from N. 50?	m/s. 13	Fr.-Cu. and haze. Erratic wind at all altitudes.	
	215	988.0	291		78	16.1	1.176	40	13		
Ground level.	115	999.5	295		64	16.9	1.173	50	12		
Computed for M.S.L.	...	1012.8	<i>Station in irregular high-pressure region.</i>								...

BRIGHTON. K. 24. June 21. 10 h. 0 m. to 11 h. 20 m. G.M.T.

Greatest height.	500	952.0	280	14.0	100	10.0	1.179	240	?	Cloud level 300 m. above ground. Wind decreasing with altitude.
	215	985.2	284		95	12.5	1.203	240	?	
Ground level.	115	997.0	287		83	13.3	1.204	240	6	
Computed for M.S.L.	(at 7 h.)	1010.9	287.5	...	...	...	...	251	6.0	...
	(at 13 h.)	1010.2	290.0	...	...	...	...	242	6.2	...

ABERDEEN. P. 120. June 1. 7 h. 50 m. G.M.T.

ABERDEEN. P. 122. June 3. 7 h. 42 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.					
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.								
				W.-E.	S.-N.						W.-E.	S.-N.							
Greatest height.	metres. 2815	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	2.9	St.-Cu. Balloon passed through two films of cloud between 1700 m. and 2000 m. and was lost in St.-Cu. Pressure Distribution (7 h.). High to west of Ireland. Low centred 1400 km. N.E. and 2000 km. S.E.	metres. 2815	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	2.9	High mist forming over city; atmosphere otherwise clear. Patches of St.-Cu. in N. and N.W. Balloon became gradually less distinct during 3-4 minutes before being lost in high mist. Pressure Distribution (7 h.). High to N. of Azores. Well-marked Low 1800 km. to N.E. Shallow Low to west of Portugal.					
	2500	306	13.5	+10.9	-7.9			2500	329	13.4	+6.9	-11.5			2500	329	13.4	+6.9	-11.5
	2000	304	7.3	+6.0	-4.1			2000	338	9.2	+3.4	-8.6			2000	338	9.2	+3.4	-8.6
	1500	304	10.6	+8.8	-6.0			1500	326	8.5	+4.7	-7.0			1500	326	8.5	+4.7	-7.0
	1000	294	11.2	+10.2	-4.5			1000	306	11.8	+9.5	-7.0			1000	306	11.8	+9.5	-7.0
	500	276	7.6	+7.6	-0.8			500	285	6.3	+6.3	-1.6			500	285	6.3	+6.3	-1.6
100 m. above ground.	114	252	4.1	+3.8	+1.3			114	322	1.1	+0.7	-0.9			114	322	1.1	+0.7	-0.9
Anemometer.	46	240	3.0	+2.6	+1.5			46	300	1.0	+0.9	-0.5			46	300	1.0	+0.9	-0.5
Computed for M.S.L.	(at 7 h.)	274	12.5	+12.5	-0.9			...	Free lift 56 gms.	(at 7 h.)	316	7.6			+5.3	-5.5	...	Free lift 53 gms.	

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 124. June 10. 7 h. 53 m. G.M.T.								ABERDEEN. P. 125. June 11. 7 h. 37 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direc-tion.	Velo-city.	Compo-nents.					Direc-tion.	Velo-city.	Compo-nents.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	2120	...	...	...	...	...	2380	...	...	...	...	...	Hazy, but cloudless. Balloon burst.
	2030	67	23.1	-21.3	-8.9	2.9	2300	345	1.6	+0.4	-1.5	2.8	Pressure Distribution (7 h.).		
	1500	56	22.0	-18.2	-12.4		2000	333	4.3	+1.9	-3.8		Station in col region. Lows centred 1400 km. to S. and over N. Iceland respectively.		
	1000	63	19.9	-17.7	-9.0		1500	335	6.0	+2.5	-5.4				
	500	39	14.7	-9.2	-11.4		1000	345	6.2	+1.6	-6.0				
100 m. above ground. Anemometer.	114	355	6.1	+0.5	-6.1		500	349	6.5	+1.2	-6.4				
	46	350	5.0	+0.9	-4.9		114	27	0.7	-0.3	-0.6				
							46	...	0	0	0				
Computed for M.S.L.	(at 7 h.)	90	10.9	-10.9	0	...	Free lift 58 gms.	(at 7 h.)	...	...	...	...	Free lift 51 gms.
ABERDEEN. P. 127. June 16. 7 h. 42 m. G.M.T.								ABERDEEN. P. 128. June 17. 7 h. 45 m. G.M.T.							
Greatest height.	4380	...	...	...	...	...	2730	...	...	...	...	...	A.-Cu. in small patches. Balloon gradually grew fainter, as if condensation were taking place under the A.-Cu.
	4300	347	5.9	+1.3	-5.7		...	...	...	...	...
	4000	1	6.6	-0.1	-6.6		...	...	...	...	...
	3500	22	7.8	-2.9	-7.2		...	...	...	...	...
	3000	20	7.5	-2.5	-7.0		...	...	...	...	...
	2500	9	5.5	-0.9	-5.4		2500	308	6.0	+4.7	-3.7	3.0	Irregular high-pressure wedge over N.W. Europe.		
	2000	357	7.4	+0.4	-7.4	2.9	2000	303	7.1	+5.9	-3.9				
	1500	1	4.0	-0.1	-4.0		1500	294	6.6	+6.0	-2.7				
	1000	2	2.6	-0.1	-2.6		1000	291	3.7	+3.4	-1.3				
	500	338	4.7	+1.7	-4.3		500	324	8.3	+4.8	-6.7				
100 m. above ground. Anemometer.	114	350	2.4	+0.4	-2.4		114	334	1.5	+0.6	-1.3				
	46	315	2.0	+1.4	-1.4		46	...	0	0	0				
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	Free lift 55 gms.	(at 7 h.)	...	...	...	...	Free lift 61 gms.
ABERDEEN. P. 130. June 22. 7 h. 46 m. G.M.T.								ABERDEEN. P. 134. June 29. 7 h. 55 m. G.M.T.							
Greatest height.	4730	...	...	...	...	...	4080	...	...	...	...	...	Fairly clear over the sea, but hazy landwards, especially towards the S.W. Ci. of true type, slightly coarse in places, but no rapid internal change. Balloon lost in distance and high haze. Assuming 8 km. as height of Ci., a nephoscope observation gave components as follows:—
	4500	172	16.6	-2.2	+16.5		...	...	...	...	...		Deg. from N. W.-E. S.-N. 282° +20 mps. -4 mps.
	4000	183	14.8	+0.7	+14.8		4000	287	21.0	+20.0	-6.1	2.7			
	3500	179	13.9	-0.2	+13.9		3500	297	17.6	+15.7	-8.0				
	3000	202	11.9	+4.5	+11.0		3000	298	19.5	+17.1	-9.3				
	2500	190	16.4	+2.9	+16.1		2500	299	17.8	+15.6	-8.5				
	2000	202	13.1	+4.9	+12.1	2.9	2000	305	15.0	+12.3	-8.6				
	1500	195	10.8	+2.8	+10.4		1500	300	12.5	+10.7	-6.3				
	1000	216	11.2	+6.6	+9.0		1000	264	7.3	+7.3	+0.8				
	500	216	7.7	+4.5	+6.2		500	206	3.4	+1.5	+3.1				
100 m. above ground. Anemometer.	114	213	7.6	+4.1	+6.4		114	114	3.2	-2.9	+1.3		Pressure Distribution (7 h.).		
	46	225	4.9	+2.8	+2.8		46	110	3.0	-2.8	+1.0		High-pressure wedge over S. England, extending to Azores. Low over Gulf of Bothnia.		
Computed for M.S.L.	(at 7 h.)	213	6.3	+3.4	+5.3	...	Free lift 54 gms.	(at 7 h.)	270	5.5	+5.5	0	...	Free lift 47 gms.	

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.
Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 50. June 2. 15 h. 47 m. G.M.T.

ESKDALEMUIR. P. 51. June 3. 7 h. 26 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	2450	...	...	...	...	...	5900	...	...	...	...	...	Registering balloon. Tail measurements taken from 3200 m. to 4200 m. to find rate of ascent (assumed to be uniform). Final elevation 22°6.
	2000	357	7.7	+ 0.4	- 7.7	1.7	5500	320	14.2	+ 9.2	- 10.8	3.7	Pressure Distribution (7 h.).	
	1750	14	6.0	- 1.5	- 5.8		5000	313	13.8	+ 10.1	- 9.4		Tongue of high pressure over S. England, extending to W. of Ireland.	
	1500	29	6.6	- 3.2	- 5.8		4500	298	10.5	+ 9.2	- 4.9		Well-defined Low 2000 km. N.E.	
	1250	348	5.8	+ 1.2	- 5.7		4000	323	11.8	+ 7.2	- 9.4			
	1000	3	5.6	- 0.3	- 5.6		3500	331	9.1	+ 4.4	- 8.0			
	750	27	4.8	- 2.2	- 4.3		3000	343	8.7	+ 2.5	- 8.3			
	500	35	1.6	- 0.9	- 1.3		2500	353	7.5	+ 0.9	- 7.4			
100 m. above ground. Anemometer.	340	48	3.0	- 2.2	- 2.0		2000	331	7.2	+ 3.5	- 6.2			
	250	60	3.5	- 3.0	- 1.8		1750	318	5.1	+ 3.4	- 3.8			
							1500	299	2.7	+ 2.3	- 1.3			
							1250	300	4.0	+ 3.5	- 2.0			
							1000	287	6.2	+ 5.9	- 1.8			
							750	285	5.7	+ 5.5	- 1.5			
							500	279	4.6	+ 4.5	- 0.7			
Computed for M.S.L.	(at 18 h.)	349	6.0	+ 1.1	- 5.9	...	(at 7 h.)	323	7.0	+ 4.2	- 5.6	...	Wt. of balloon ? Free lift ?	

ESKDALEMUIR. P. 52. June 11. 12 h. 55 m. G.M.T.

ESKDALEMUIR. P. 53. June 15. 12 h. 25 m. G.M.T.

Greatest height.	3000	...	...	...	...	...	3200	...	...	...	...	...	Final elevation 29°3. Clouds Al.-Str. from E.N.E. Barometer steady. Balloon lost in distance.
	3000	62	8.1	- 7.1	- 3.8	2.6	3000	21	1.7	- 0.6	- 1.6	2.4	Pressure Distribution (7 h.).
	2500	59	2.6	- 2.2	- 1.3		2500	4	4.6	- 0.3	- 4.6		Elongated High over N.W. of Scotland.
	2000	57	7.0	- 5.9	- 3.8		2000	336	12.6	+ 5.1	- 11.5		Slight gradient over Central Europe.
	1750	61	8.1	- 7.0	- 3.9		1750	20	6.8	- 2.3	- 6.4		
	1500	60	8.0	- 6.9	- 4.0		1500	68	5.0	- 4.6	- 1.9		
	1250	56	8.5	- 7.0	- 4.7		1250	65	4.9	- 4.4	- 2.1		
	1000	54	5.6	- 4.5	- 3.3		1000	71	4.2	- 4.0	- 1.4		
	750	61	5.8	- 5.1	- 2.8		750	56	4.7	- 3.9	- 2.6		
	500	55	7.6	- 6.2	- 4.3		500	55	4.8	- 3.9	- 2.7		
100 m. above ground. Anemometer.	340	58	5.7	- 4.8	- 3.0		340	55	4.5	- 3.7	- 2.6		
	250	70	6.2	- 5.8	- 2.1		250	24	3.0	- 1.2	- 2.7		
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 7 h.)	54	4.7	- 3.8	- 2.8	...	Wt. of balloon 18.5 gms. Free lift 54.3 gms.

ESKDALEMUIR. P. 55. June 18. 11 h. 18 m. G.M.T.

ESKDALEMUIR. P. 57. June 23. 12 h. 27 m. G.M.T.

Greatest height.	3130	...	...	...	...	...	2220	...	...	...	...	...	Final elevation 12°3. Clouds Str.-Cu.7 from N.W. Barometer steady. Balloon lost in cloud.
	3000	242	5.9	+ 5.2	+ 2.8	2.5	2000	310	5.1	+ 3.9	- 3.3	1.6	Pressure Distribution (7 h.).
	2500	238	4.9	+ 4.2	+ 2.6		1750	312	5.4	+ 4.0	- 3.6		Slight gradient over British Isles. High centred 1100 km. to S.
	2000	256	4.5	+ 4.3	+ 1.1		1500	313	6.2	+ 4.5	- 4.2		
	1750	217	5.3	+ 3.2	+ 4.2		1250	321	5.3	+ 3.3	- 4.1		
	1500	207	5.9	+ 2.7	+ 5.2		1000	319	10.7	+ 7.0	- 8.1		
	1250	197	4.4	+ 1.3	+ 4.2		750	314	12.6	+ 9.0	- 8.8		
	1000	202	4.6	+ 1.7	+ 4.2		500	319	4.5	+ 2.9	- 3.4		
	750	220	3.8	+ 2.4	+ 2.9								
	500	212	4.1	+ 2.2	+ 3.5								
100 m. above ground. Anemometer.	340	214	4.7	+ 2.6	+ 3.9		340	300	7.7	+ 6.7	- 3.8		
	250	225	3.6	+ 2.5	+ 2.5		250	294	7.6	+ 6.9	- 3.1		
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 13 h.)	329	6.4	+ 4.8	+ 4.2	...	Wt. of balloon 5.5 gms. Free lift 7.9 gms.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 71. June 3. 7 h. 0 m. G.M.T.								SOUTH FARNBOROUGH. P. 27. June 4. 6 h. 55 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.		Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direc-tion.	Velo-city.	Components.						Direc-tion.	Velo-city.	Components.				
				W.-E.	S.-N.							W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	3775	...	...	...	...	...	Clear.	4060	...	...	...	...	...	Hazy.	
	3705	16	6.8	- 1.9	- 6.5	2.4	Some A.-St. at first, which disappeared into Fr.-Cu. Balloon lost in distance. Pressure distribution (7 h.). Station in tongue of high pressure extending over Ireland and Atlantic.	3990	312	6.4	+ 4.7	- 4.3	2.4	Ci ₂ (moving from W.) clearing somewhat during ascent. Balloon lost in distant haze. Pressure Distribution (7 h.). High pressure extending west. Low over Gulf of Bothnia.		
	3500	11	6.7	- 1.3	- 6.6			3500	308	6.1	+ 4.7	- 3.8				
	3000	4	4.7	- 0.3	- 4.7			3000	346	3.8	+ 0.9	- 3.7				
	2500	2	5.7	- 0.2	- 5.7			2500	357	6.3	+ 0.3	- 6.3				
	2000	18	4.4	- 1.4	- 4.2			2000	304	3.3	+ 2.7	- 1.8				
	1750	12	5.1	- 1.1	- 5.0			1750	218	1.7	+ 1.0	+ 1.3				
	1500	321	7.3	+ 4.6	- 5.6			1500	312	1.2	+ 0.9	- 0.8				
	1250	329	8.0	+ 4.1	- 6.8			1250	326	3.3	+ 1.8	- 2.7				
	1000	336	7.7	+ 3.1	- 7.0			1000	329	4.5	+ 2.3	- 3.8				
	750	354	7.2	+ 0.7	- 7.2			750	336	4.5	+ 1.8	- 4.1				
	500	7	4.0	- 0.5	- 3.9	500	329	3.9	+ 2.0	- 3.3						
100 m. above ground. Anemometer.	170	60	0.8	- 0.7	- 0.4		170	314	3.8	+ 2.7	- 2.6					
	105	90	1.0	- 1.0	0		105	...	0	0	0					
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 7 h.)	2	5.0	- 0.1	- 5.0	...	...	...
SOUTH FARNBOROUGH. P. 75. June 15. 10 h. 40 m. G.M.T.								SOUTH FARNBOROUGH. P. 76. June 17. 6 h. 20 m. G.M.T.								
Greatest height.	2355	...	...	...	...	...	Slight haze. Al.-Cu ₁ Balloon lost in haze.	8465	...	...	...	...	...	St. haze. Balloon lost in distance.	
	...	...	...	...	...	...	Pressure Distribution (7 h.). Irregular high pressure over Europe generally. Elongated High centred 1000 km. N.E.	8395	99	5.1	- 5.0	+ 0.8	2.4	Pressure Distribution (7 h.). Station in centre of small High of local character. Wedge of irregular high pressure extending over N.W. Europe.	
	...	...	...	...	...	8000		106	7.5	- 7.2	+ 2.1				
	...	...	...	...	...	7500		112	4.5	- 4.1	+ 1.7				
	...	...	...	...	...	7000		110	5.0	- 4.7	+ 1.7				
	...	...	...	...	...	6500		106	4.6	- 4.4	+ 1.3				
	...	...	...	...	...	6000		112	4.6	- 4.2	+ 1.7				
	...	...	...	...	...	5500		93	2.1	- 2.1	+ 0.1				
	...	...	...	...	...	5000		138	1.2	- 0.8	+ 0.9				
	...	...	...	...	...	4500		70	2.0	- 1.9	- 0.7				
	...	...	...	...	...	4000		49	2.9	- 2.2	- 1.9				
	...	...	...	...	...	3500	68	5.3	- 4.9	- 2.0					
	...	...	...	...	...	3000	72	4.3	- 4.1	- 1.3					
	...	...	...	...	...	2500	45	3.4	- 2.4	- 2.4					
	...	...	...	...	...	2000	58	2.1	- 1.8	- 1.1					
	...	...	...	...	...	1750	44	3.5	- 2.4	- 2.5					
	...	...	...	...	...	1500	33	4.6	- 2.5	- 3.8					
	...	...	...	...	...	1250	50	5.6	- 4.3	- 3.6					
	...	...	...	...	...	1000	35	6.8	- 3.9	- 5.5					
	...	...	...	...	...	750	37	5.9	- 3.5	- 4.7					
	...	...	...	...	...	500	34	4.0	- 2.2	- 3.3					
100 m. above ground. Anemometer.	170	19	3.6	- 1.2	- 3.4		170	342	1.6	+ 0.5	- 1.5					
	105	23	6.0	- 2.3	- 5.5		105	...	0	0	0					
Computed for M.S.L.	(at 7 h.)	63	9.4	- 8.4	- 4.3	...	(at 7 h.)	...	...	...	...	...	...
	(at 13 h.)	57	7.4	- 6.2	- 4.0	...		...	...	...	...	...	...
SOUTH FARNBOROUGH. P. 77. June 18. 10 h. 45 m. G.M.T.								SOUTH FARNBOROUGH. P. 79. June 24. 6 h. 45 m. G.M.T.								
Greatest height.	5625	...	...	...	...	...	Haze. Ci ₁ . (moving very slowly). Balloon lost in distance.	2500	...	...	...	...	...	Very clear and cloudless. Balloon lost in distance.	
	5500	119	6.1	- 5.3	+ 2.9	2.4	Pressure Distribution (7 h.). No definite gradient over British Isles, but influenced by High over Azores.	...	...	...	...	...	...	Pressure Distribution (7 h.). High over Azores, influencing W. Europe. Low to N.W. of Iceland.	
	5000	111	5.0	- 4.6	+ 1.8			...	...	...	...	...	...
	4500	130	3.0	- 2.3	+ 1.9			...	...	...	...	...	...
	4000	121	2.6	- 2.2	+ 1.3			...	...	...	...	...	...
	3500	135	1.7	- 1.2	+ 1.2			...	...	...	...	...	...
	3000	138	3.9	- 2.6	+ 2.9			...	...	...	...	...	...
	2500	145	4.0	- 2.3	+ 3.3			...	...	...	...	...	...
	2000	131	2.8	- 2.1	+ 1.8			...	...	...	...	...	...
	1750	61	1.0	- 0.9	- 0.5			...	...	...	...	...	...
	1500	17	1.7	- 0.5	- 1.6			...	...	...	...	...	...
	1250	24	2.2	- 0.9	- 2.0	...	...	...	...	...	...
	1000	53	2.2	- 1.7	- 1.3	...	...	...	...	...	...
	750	107	1.7	- 1.6	+ 0.5	...	...	...	...	...	...
	500	160	1.5	- 0.5	+ 1.4	...	...	...	...	...	...
100 m. above ground. Anemometer.	170	138	1.4	- 0.9	+ 1.0			...	...	...	...	...
	105	125	0.5	- 0.4	+ 0.3			...	...	...	...	...
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 7 h.)	307	7.0	+ 5.6	- 4.2	...	...	

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 80. June 26. 6 h. 45 m. G.M.T.								SOUTH FARNBOROUGH. P. 81. June 27. 6 h. 45 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	3210	...	...	...	...	...	2785	...	...	...	...	...	Clear and cloudless.	
	3000	272	2'9	+ 2'9	- 0'1	2'4	2715	294	7'6	+ 6'9	- 3'1	2'4	Balloon lost in distance.		
	2500	263	3'2	+ 3'2	+ 0'4		2500	303	7'9	+ 6'6	- 4'3				
	2000	315	1'0	+ 0'7	- 0'7		2000	300	5'9	+ 5'1	- 3'0				
	1750	51	2'0	- 1'5	- 1'2		1750	313	2'5	+ 1'8	- 1'7				
	1500	80	1'1	- 1'1	- 0'2		1500	345	1'6	+ 0'4	- 1'5				
	1250	141	2'7	- 1'7	+ 2'1		1250	345	1'2	+ 0'3	- 1'1				
	1000	135	7'1	- 5'0	+ 5'0		1000	360	1'1	0'0	- 1'1				
	750	131	8'5	- 6'4	+ 5'5		750	345	1'2	+ 0'3	- 1'1				
	500	121	6'6	- 5'6	+ 3'4		500	313	2'1	+ 1'5	- 1'4				
100 m. above ground. Anemometer.	170	53	2'5	- 2'0	- 1'5		170	Low centred 1700 km. to N.N.W.
	105	...	0	0	0	105	...	0	0	0	...	...	
Computed for M.S.L.	(at 7 h.)	75	8'7	- 8'4	- 2'2	...	(at 7 h.)	...	...	...	...	...	...

SOUTH FARNBOROUGH. P. 82. June 29. 6 h. 35 m. G.M.T.								SOUTH FARNBOROUGH. P. 83. June 30. 10 h. 40 m. G.M.T.							
Greatest height.	4485	...	...	...	...	...	4345	...	...	...	...	...	Very clear; cloudless. Balloon lost in distance.	
	4415	334	6'4	+ 2'8	- 5'8	2'4	4275	221	10'6	+ 6'9	+ 8'0	2'4	Balloon lost in distance.		
	4000	292	8'7	+ 8'0	- 3'3		4000	211	10'9	+ 5'7	+ 9'3				
	3500	308	8'7	+ 6'8	- 5'4		3500	197	6'2	+ 1'8	+ 5'9				
	3000	294	6'4	+ 5'8	- 2'6		3000	205	7'5	+ 3'2	+ 6'8				
	2500	296	6'9	+ 6'2	- 3'0		2500	217	6'8	+ 4'1	+ 5'4				
	2000	307	6'4	+ 5'1	- 3'8		2000	213	4'8	+ 2'6	+ 4'0				
	1750	312	6'9	+ 5'1	- 4'6		1750	203	6'6	+ 2'6	+ 6'1				
	1500	304	4'9	+ 4'0	- 2'7		1500	196	5'5	+ 1'5	+ 5'3				
	1250	302	3'4	+ 2'9	- 1'8		1250	182	4'6	+ 0'1	+ 4'6				
	500	10	2'8	- 0'5	- 2'7		1000	170	6'2	- 1'1	+ 6'1				
100 m. above ground. Anemometer.	170	8	2'9	- 0'4	- 2'9	170	214	5'0	+ 2'8	+ 4'2			Station in centre of high pressure. High over France and Germany, and also Azores. Low to W. Iceland.		
	105	315	1'0	+ 0'7	- 0'7	105	180	2'0	0	+ 2'0					
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 7 h.)	...	...	...	...	...	...

FALMOUTH. P. 65. June 16. 11 h. 20 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.				
				W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.			
	2220	...	...	...	...	2'0	Cloudless. Warm and bright; continuous sunshine; light sea breeze (S.S.E.) middle of day.
	2000	49	8'0	- 6'0	- 5'3			
	1750	46	6'5	- 4'7	- 4'5			
	1500	58	6'2	- 5'2	- 3'3			
	1250	39	7'7	- 4'8	- 6'0			
	1000	35	5'5	- 3'2	- 4'5			
	750	31	4'3	- 2'2	- 3'7			
	500	127	0'5	- 0'4	+ 0'3			
100 m. above ground. Anemometer.	151	153	4'2	- 1'9	+ 3'8			High-pressure wedge over N.W. Europe.
	63	159	2'0	- 0'7	+ 1'8			
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	Wt. of balloon 6'8 gms. Free lift 21'4 gms.

Note.—In addition to the ascents tabulated above, a number of pilot balloons, which were lost sight of before reaching a height of 2 kilometres, were sent up from various stations, as follows:—Aberdeen, 7; Eskdalemuir, 2; South Farnborough, 3; and Falmouth 3.

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914.	June 3.	7 h. 2 m. G.M.T.	SOUNDING No., 283.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
						Reading.	Fall per Km.	
			PLACE, BENSON.	km.	mb.	°A.	°C.	
			Latitude, 51° 37' N.	18·0	77	219		Light E. wind.
			Longitude, 1° 7' W.	17·0	96	218 219	-1 0	Inversion at 2·0 km., 1° on one trace, 2° on the other.
GREATEST HEIGHT,	} 18·0 km.	77 mb.	Height above M.S.L., } 57 m.	16·36	100	218 219	-1 0	H _c . at 11·9 km. at 210° on one, at 12·0 km. at 213° on the other.
LOWEST TEMPERATURE,				} 11·9 km.	195 mb.	211° A.	16·0	106	217 219	-1 0	Both traces quite distinct, crossing each other in the lower part.
BASE OF STRATOSPHERE,	} 11·9 km.	195 mb.	211° A.				15·0	123	216 219	-3 -1	Note.—The two sets of temperatures and two traces referred to give the ascending and descending readings from one and the same instrument.
Type				No. 1.			14·0	144
			PLACE OF FALL, Chiddingfold, Surrey.	13·0	169	216	-6 -3	
			Distance, and Orientation, 63 km. 150° from N.	12·0	198	210 213		
				11·95	200	212 214	5 4	
				11·0	233	215 217	7 7	
				10·0	272	222 224	9 9	<i>Pressure Distribution (7 h.).</i>
				9·35	300	228 230		
				9·0	317	231 233	9 9	Station in small tongue of high pressure over Central England.
				8·0	366	240 242		Well-defined High to W. of Ireland. Low 1600 km. to S.W.
				7·35	400	246	8 6	
				7·0	420	248	8	
				6·0	482	256		
				5·71	500	258	7	
				5·0	549	263		
				4·32	600	268	7	
				4·0	625	270		
				3·13	700	274	4	
				3·0	708	274		
				2·03	800	276	2	
				2·0	803	276		
				1·07	900	279	3	
				1·0	908	279		
				·20	1000	285	7	
				Ground	1018	286	...	
				M.S.L.	1025	...	...

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914.	June 3.	7 h. 26 m. G.M.T.	SOUNDING No., 288.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
						Reading.	Fall per-Km.	
			PLACE, ESKDALEMUIR.	km.	mb.	°A.	°C.	
			Latitude, 55° 19' N.	6·0	477	251		Inversion 274° to 276° at 1·7 km.
			Longitude, 3° 12' W.	5·63	500	253	5	Isothermal at 276° from 1·7 to 2·2 km.
GREATEST HEIGHT,	} 6·5 km.	445 mb.	Height above M.S.L., } 242 m.	5·0	545	256		Too hazy for theodolite observations.
LOWEST TEMPERATURE,				} ? km.	? mb.	? A.	4·26	600	262	8	Note.—The balloon used in this ascent is the same as that employed for P. 51 given on p. 53.
BASE OF STRATOSPHERE,	} ? km.	? mb.	? A.				4·0	622	264
Type				No. ?			3·07	700	272	8
			PLACE OF FALL, Canonbie, Dumfriesshire.	3·0	708	272	4	
			Distance, and Orientation, 30 km. 140° from N.	2·0	800	276		<i>Pressure Distribution (7 h.).</i>
				1·05	900	278	2	High to W. of Ireland. Low 2000 km. to N.E.
				1·0	906	278		
				·20	1000	...	3	
				Ground	...	281	...	
				M.S.L.	1025	...	...

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. June 5.	7 h. 2 m. G.M.T.			SOUNDING No., 289. PLACE, ESKDALEMUIR. Latitude, 55° 19' N. Longitude, 3° 12' W. Height above M.S.L., } 242 m. PLACE OF FALL, Penrith, Cumberland. Distance, 75 km. and Orientation, 158° from N.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
	Height above M.S.L.	Pressure.	Temp.				Reading.	Fall per Km.	
GREATEST HEIGHT, } LOWEST TEMPERATURE, } BASE OF STRATOSPHERE, } Type ?	6.5 km. ? km. ? km. ?	439 mb. ? mb. ? mb.	250° A. ? A. ? A.	km. 6.0 5.53 5.0 4.17 4.0 3.0 2.99 2.0 1.94 1.0 .99 .14	mb. 471 500 539 600 615 698 700 793 800 899 900 1000	°A. 253 255 258 261 262 267 267 273 273 274 274 ...	°C. 5 4 5 6 1 8 ...	Isenthal 274° from 0.9 to 1.5 km. Inversion 260° to 261° at 4.3 km. Isenthal 258° from 4.7 to 5.0 km. Balloon lost in stratus clouds to S.E. after a few minutes. <i>Pressure Distribution (7 h.).</i> High to W. of Ireland. Well-defined Low 1800 km. N.E.	
From observations at Station.				at 7 h.	at 18 h. G. M. T.				
PRESSURE (M.S.L.),				1018 mb.	1017 mb.				
TEMPERATURE,				282° A.	285° A.				
VAPOUR PRESSURE,				...	...		
GRADIENT WIND:—Direction,				336°	344°				
Velocity,				10.1 m/s.	9.3 m/s.				
Correction for Curvature,				0 m/s.	0 m/s.				
Final Components, { W. to E. S. to N.				+ 4.1 m/s. - 9.2 m/s.	+ 2.6 m/s. - 9.0 m/s.				
						Ground M.S.L.	989 1018	282...	......

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.-E.		S.-N.
1	A.-Cu.	303	m/s. 5.7	m/s. + 4.8	m/s. - 3.1	A.-Cu. rapidly becoming St.-Cu. and degrading.
2	Cu.	345	7.4	+ 1.9	- 7.2	
3	St.-Cu.	296	6.3	+ 5.7	- 2.8	Thin, diffuse, flat St.-Cu.
4	Nb.-Cuf.	318	21.0	+ 14.1	- 15.5	Loose low type Nb.-Cuf. Height 500 m.
5	Cu.	330	15.0	+ 7.5	- 13.0	Degraded Cu. or Nb.-Cuf.
6	Ci.	248	4.5	+ 4.2	+ 1.7	Ci. to Ci.-St.
„	Fr.-Cu.	315	21.0	+ 14.8	- 14.8	
11	Ci.-Cu.	107	1.4	- 1.3	+ 0.4	
12	St.-Cu.	98	2.5	- 2.5	+ 0.3	Thin high St.-Cu.
22	Ci.-Cu.	167	4.1	- 0.9	+ 4.0	False Ci. which became Ci.-Cu. Height 4.7 km. <i>Observation at 8 h.</i>
23	Cu.-Nb.	320	3.1	+ 2.0	- 2.4	
24	Ci.	320	4.2	+ 2.7	- 3.2	<i>Observation at 8 h.</i>
„	A.-Cu.	316	4.0	+ 2.8	2.8	Closed sheet of A.-Cu.
25	Cu.	278	6.3	+ 6.1	- 0.9	
26	Ci.	272	2.2	+ 2.2	- 0.1	Became Ci.-Cu.-lenticularis at 13 h. <i>Observation at 8 h.</i>
27	St.-Cu.	260	6.0	+ 5.9	+ 1.0	
29	Ci.	282	2.5	+ 2.5	- 0.5	<i>Observation at 8 h.</i> Ci. true type.
„	Cu.	270	8.0	+ 8.0	0.0	
30	Cu.	245	10.0	+ 9.1	+ 4.0	

11. Solar Radiation at South Kensington.

Day.	APRIL.					MAY.					JUNE.					REMARKS.
	Max. Rate, Milliwatts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		Max. Rate, Milliwatts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		Max. Rate, Milliwatts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		
		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.	
1	63	1243	59	5.5	43	68	1132	40	4.7	32	88	1876	55	7.6	47	
2	60	563	27	2.3	18	79	1758	61	8.2	55	85	1532	46	5.0	31	
3	57	1174	55	3.9	30	75	1192	41	1.6	11	76	2383	70	14.3	88	
4	60	608	28	1.4	11	78	1223	42	4.3	29	77	1950	66	11.9	73	
5	62	660	30	1.6	12	80	1232	42	5.3	35	63	666	20	0.3	2	
6	70	1602	73	9.9	75	56	744	25	1.2	8	<i>n</i> 36	<i>n</i> 466	14	0.0	0	
7	68	969	43	4.7	35	83	909	30	2.8	19	80	1245	37	3.1	19	
8	76	1496	66	9.0	68	85	1970	65	11.6	77	87	1611	47	5.8	35	
9	50	746	32	1.9	14	<i>n</i> 27	<i>n</i> 420	14	0.0	0	51	825	24	1.7	10	
10	<i>x</i> 80	1625	70	8.5	63	36	861	28	1.0	7	90	2071	60	12.8	78	
11	74	770	33	3.2	24	80	1118	37	1.7	11	81	2106	62	9.4	57	
12	71	1865	79	11.3	83	89	1435	47	5.5	36	73	1385	40	7.0	42	
13	67	1191	50	3.3	24	44	667	22	0.0	0	80	1524	44	9.0	54	
14	76	1788	73	11.0	80	80	1536	49	6.8	44	75	1188	34	7.0	42	
15	70	1422	58	10.4	75	66	1738	55	9.5	61	83	2330	67	<i>x</i> 15.0	<i>x</i> 91	
16	65	1694	68	11.6	84	79	2120	67	11.4	73	90	1077	31	4.6	28	
17	68	1819	72	10.6	76	74	<i>x</i> 2304	76	<i>x</i> 13.9	<i>x</i> 89	76	1690	49	9.8	59	
18	66	1852	73	11.9	85	75	2299	72	13.4	85	72	1936	56	10.9	66	
19	68	1894	73	12.3	<i>x</i> 88	56	1634	51	10.6	68	68	1829	53	10.5	63	
20	62	1666	63	12.4	<i>x</i> 88	58	1263	39	5.1	32	79	1546	45	6.9	42	
21	54	1465	56	11.2	79	77	2227	69	13.8	87	83	1393	40	5.8	35	
22	54	748	28	0.6	4	72	2174	67	12.9	82	<i>x</i> 93	2147	62	9.8	59	
23	65	970	36	4.8	34	72	667	21	0.6	4	81	1218	35	6.0	36	
24	69	1021	38	3.2	22	82	1024	32	2.5	16	87	2022	58	11.0	66	
25	72	1220	45	5.7	40	84	1514	46	5.6	35	81	1813	52	9.0	54	
26	56	1671	61	12.3	85	<i>x</i> 91	1555	47	6.5	41	72	2053	59	12.5	75	
27	54	1314	47	7.6	52	<i>x</i> 91	2012	61	12.3	76	80	2211	64	11.3	68	
28	69	<i>x</i> 1954	70	<i>x</i> 12.5	86	80	940	28	2.0	12	79	<i>x</i> 2475	71	12.3	74	
29	63	1298	46	6.6	45	65	1337	40	2.8	17	84	2172	63	12.6	76	
30	<i>n</i> 16	<i>n</i> 278	10	0.0	0	61	1141	34	2.5	15	77	2447	70	<i>x</i> 15.0	<i>x</i> 91	
31						80	1654	49	7.5	46						
Total	...	38586	52	211	51	...	43800	45	188	39	...	51187	50	258	53	
Mean	64	R=1286		H=7.03		72	R=1413		H=6.06		78	R=1706		H=8.60		
Ratio of Mean Daily Amount to Mean Duration.				$\frac{R}{H} = 183$					$\frac{R}{H} = 233$					$\frac{R}{H} = 198$		

Note.—1 watt per cm² = 14.35 gramme-calories per cm² per minute. 1 gramme-calorie per minute = 0.7 watt nearly. 1 Joule = 0.239 gramme-calories.

If the heat were distributed throughout the atmosphere, 1000 gramme-calories per cm² would be sufficient to raise the temperature 4°.1 C. It would take 245 gramme-calories per cm² to raise the temperature of the whole atmosphere 1° C.

N.B.—The values of Solar Radiation at South Kensington are obtained from the records of a Callendar Instrument which depends upon the difference of temperature between a black and a bright wire exposed horizontally to radiation from the whole of the sky. The values may be taken as representing the total radiation and the maximum rate of radiation per cm² received by a horizontal surface. If it is desired to compare the values published for Kew and Eskdalemuir in Tables 3 and 4 with the simultaneous value recorded by the Callendar Instrument, the former must be multiplied by the cosine of the zenith distance of the sun at the time of observation. The duration of sunshine in this table is obtained from a Campbell-Stokes Recorder.

For values January to March see p. 24.

* The "Ideal" intensity of radiation at any instant is taken to be a function of the Sun's altitude only. It is approximately the highest intensity recorded at South Kensington for the corresponding elevation of the Sun. The "Ideal" amount for the day is found by integrating the "Ideal" intensity from sun-rise to sun-set: it is the amount which could be recorded on a day when the atmosphere was in its most transparent state from sun-rise to sun-set. A memoir dealing with the subject is in preparation.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H=5.5 m. Barometer, H_b=10.4 m.

Heights above Ground:—Thermometers, h_t=3.0 m. Rain-gauge, h_r=0.53 m. Sunshine Recorder, h_s=13.3 m. Cups of Anemometer, h_a=20 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground. Includes means and normals for 25, 30, and 40 years.

4. ESKDALEMUIR OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H=242.0 m. Barometer, H_b=237.3 m.

Heights above Ground:—Thermometers, h_t=0.9 m. Rain-gauge, h_r=0.38 m. Sunshine Recorder, h_s=1.5 m. Vane of Anemometer, h_a=15 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction, Cloud Amount, Rain, Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground. Includes remarks on weather conditions and monthly/normal totals.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.), unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type. * 15 days.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust., Time of Gust., and Date, 3 h., 9 h., 15 h., 21 h., Vel. in Max. Hourly Run., Time of Max. for HOLYHEAD and DEERNESS.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust., Time of Gust., and Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust. (Gorleston), Time of Gust. for SCILLY and GREAT YARMOUTH.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. * No record. † Robinson Cup Anemometer; Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.8. ‡ Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.
Soundings by Kites (K.) and Pilot Balloons (P.).

BRIGHTON. K. 25. July 19. 9 h. 45 m. to 11 h. 45 m. G.M.T.										
Soundings with Kites.	Height above M.S.L.	Pressure.	Temperature.		Humidity.	Density of Atmosphere.	Wind.		Cloud Observations and Remarks.	
			Reading.	Fall per km.			Direction.	Velocity.		
Greatest height.	metres.	mb.	°A.	°C.	%.	mb.	mgm/cc.	Degrees from N.	m/s.	Little A.-Cu. and scud at 500 m. Wind rate estimated from pull of Kite.
	1440	849.9	279	2.3	75	7.1	1.058	180	12	
	1000	896.6	280	12.0	75	7.5	1.111	180	11	
	500	952.1	286	5.3	90	13.4	1.153	140	6.5	
Ground level.	215	984.7	287.5		90	14.8	1.186	140	11	
	115	996.3	292.5		76	17.1	1.179	120	8	
Computed for M.S.L. (at 13 h.)										Station in col region.

ESKDALEMUIR. P. 58. July 2. 18 h. 30 m. G.M.T.							ESKDALEMUIR. P. 59. July 4. 11 h. 8 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Balloon lost to view at a final elevation of 16°, owing to passage of Fr.-Cu. Cirrus from S.W. Fr.-Cu. from S.E. Sky $\frac{1}{2}$ covered. Barometer falling.	
	3770	...	...	...	...	...	3340	...	...	...	...	Pressure Distribution (7 h.). Col region over British Isles. Well-defined Low to W. of Ireland.		
	3500	190	15.6	+2.7	+15.3	2.1	...	...	...	...	...
	3000	182	10.3	+0.4	+10.3	...	3000	197	12.8	+3.8	+12.2			...
	2500	195	9.3	+2.4	+9.0	...	2500	193	11.0	+2.4	+10.7			...
	2000	196	6.9	+1.9	+6.6	...	2000	182	10.5	+0.3	+10.5			...
	1750	207	7.1	+3.2	+6.3	...	1750	182	9.4	+0.4	+9.4			...
	1500	218	9.8	+6.1	+7.7	...	1500	159	7.7	-2.7	+7.2			...
	1250	222	9.6	+6.4	+7.1	...	1250	135	9.6	-6.8	+6.7			...
	1000	250	6.3	+5.9	+2.1	...	1000	135	5.9	-4.2	+4.2			...
750	255	5.0	+4.8	+1.3	...	750	133	5.2	-3.8	+3.5	...			
100 m. above ground. Anemometer.	500	229	4.8	+3.6	+3.1	...	500	150	5.4	-2.7	+4.7	...		
	340	222	4.7	+3.2	+3.5	...	340	156	5.3	-2.2	+4.9	...		
250	210	3.9	+2.0	+3.4	...	250	158	4.6	-1.7	+4.2	...			
Computed for M.S.L. (at 18 h.)	292	3.5	+3.3	-1.3	...	Wt. of balloon 19.2 gms. Free lift 36.0 gms.	(at 7 h.)	...	...	...	...	Wt. of balloon 18.5 gms. Free lift 56.0 gms.		

ESKDALEMUIR. P. 60. July 8. 11 h. 5 m. G.M.T.							ESKDALEMUIR. P. 61. July 15. 14 h. 22 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	4350	5515	Ci.-St. and Ci.-Nebula ₆ moving from S. Final elevation of balloon 19°7. Pressure Distribution (18 h.). Irregular over Europe generally, with slight gradient. High over Azores.	
	...	...	...	...	...	...	5000	180	11.2	0	+11.2	2.6
	4000	180	4.4	0	+4.4	...	4500	179	8.3	-0.2	+8.3	...		
	3500	188	3.8	+0.5	+3.7	...	4000	187	9.4	+1.1	+9.3	...		
	3000	190	6.4	+1.1	+6.3	...	3500	182	5.8	+0.2	+5.8	...		
	2500	231	4.8	+3.7	+3.0	...	3000	122	7.6	-6.5	+4.0	...		
	2000	147	6.9	-3.8	+5.8	...	2500	160	7.0	-2.4	+6.6	...		
	1750	143	8.5	-5.2	+6.8	...	2000	187	6.8	+0.8	+6.8	...		
	1500	137	7.1	-4.8	+5.1	...	1750	197	8.0	+2.4	+7.6	...		
	1250	146	8.5	-4.7	+7.0	...	1500	207	6.7	+3.0	+6.0	...		
100 m. above ground. Anemometer.	1000	152	5.7	-2.7	+5.0	...	1250	207	3.7	+1.7	+3.3	...		
	750	163	5.4	-1.6	+5.1	...	1000	219	5.6	+3.5	+4.3	...		
500	171	5.8	-0.9	+5.7	...	750	218	6.7	+4.1	+5.3	...			
340	?	?	?	?	...	500	218	7.2	+4.4	+5.7	...			
250	160	4.5	-1.5	+4.2	...	340	213	5.5	+3.0	+4.6	...			
250	160	4.5	-1.5	+4.2	...	250	215	5.0	+3.5	+3.5	...			
Computed for M.S.L. (at 7 h.)	166	7.9	-1.9	+7.7	...	Wt. of balloon 20.5 gms. Free lift 65 gms.	(at 18 h.)	...	...	...	...	Wt. of balloon 19.0 gms. Free lift 77 gms.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.
Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 62. July 21. 10 h. 51 m. G.M.T.							ESKDALEMUIR. P. 64. July 31. 10 h. 23 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direc- tion.	Velo- city.	Components.					Direc- tion.	Velo- city.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
Greatest height.	4530	...	...	...	...	Final elevation 33° 5. Ci.-Cu. moving from S. nearly all day, but at 21 h. both Ci. and Ci.-Cu. were moving from S.W. Pressure Distribution (7 h.). Shallow Low 1200 km. S., with slight or indefinite gradient over Europe. Well-defined High 2200 km. W.S.W.	2875	...	...	...	...	Balloon lost in mist at final elevation 15° 4. Pressure Distribution (7 h.). High centred 900 km. S.E., but well-defined Low 1400 km. W., which became dominant about 13 h.
	4000	253	6.1	+ 5.8	+ 1.8		
	3500	259	6.8	+ 6.7	+ 1.3		
	3000	261	4.6	+ 4.5	+ 0.7		
	2500	273	4.0	+ 4.0	- 0.2		...	2500	181	15.0	+ 0.3		+ 15.0	...
	2000	270	1.6	+ 1.6	0		...	2000	192	11.7	+ 2.4		+ 11.5	...
	1500	209	3.1	+ 1.5	+ 2.7		...	1750	190	9.3	+ 1.6		+ 9.2	...
	1250	203	2.6	+ 1.0	+ 2.4		2.4	1500	186	8.1	+ 0.8		+ 8.1	...
	1000	227	2.5	+ 1.8	+ 1.7		...	1250	183	6.8	+ 0.3		+ 6.8	...
	750	263	0.8	+ 0.8	+ 0.1		...	1000	174	6.3	- 0.5		+ 6.3	...
100 m. above ground. Anemometer.	500	195	2.0	+ 0.5	+ 1.9	...	750	209	5.4	+ 2.6	+ 4.7	...		
	340	180	2.2	0	+ 2.2	...	340	160	3.0	- 1.0	+ 2.8	...		
	250	180	1.5	0	+ 1.5	...	250	150	3.0	- 1.5	+ 2.6	...		
Computed for M.S.L.	(at 7 h.)	...	...	...	...	...	(at 7 h.)	175	5.8	- 0.5	+ 5.8	...
						Wt. of balloon 18.5 gms. Free lift 55 gms.	(at 13 h.)	187	9.1	+ 1.1	+ 9.0	...		
SOUTH FARNBOROUGH. P. 84. July 1. 15 h. 10 m. G.M.T.							SOUTH FARNBOROUGH. P. 85. July 4. 6 h. 50 m. G.M.T.							
Greatest height.	2500	...	...	...	...	Hazy. Cu., Ci.-St., and Cu. moving very slowly. Balloon lost in distance. During the first 2 min. the balloon was in a downward current. Pressure distribution (18 h.). Shallow depression over Ireland. Pressure irregular over Europe generally, but High centred 1700 km. E.N.E.	8745	...	...	...	...	Very clear. Cloudless at first, but Ci.-Cu. developing. Balloon lost in distance. Pressure Distribution (7 h.). Station in deformed col region. Low centred 1000 km. W.N.W.
		8675	326	14.3	+ 8.0	- 11.8		...	
		8500	333	13.5	+ 6.2	- 12.0		...	
		8000	338	12.5	+ 4.7	- 11.5		...	
		7500	354	9.5	+ 1.0	- 9.5		...	
		7000	2	7.3	- 0.2	- 7.3		...	
		6500	349	3.6	+ 0.7	- 3.5		...	
		6000	4	3.1	- 0.2	- 3.1		...	
		5500	28	3.7	- 1.7	- 3.2		...	
		5000	34	2.3	- 1.3	- 1.9		...	
	...	...	...	...	...	4500	331	2.3	+ 1.1	- 2.0	...	
	...	...	...	...	...	4000	346	3.2	+ 0.8	- 3.1	...	
	...	...	...	...	...	3500	308	3.6	+ 2.2	- 2.8	...	
	...	...	...	...	...	3000	330	2.4	+ 1.2	- 2.1	...	
	2430	198	6.6	+ 2.0	+ 6.3	2.4	2500	310	1.6	+ 1.2	- 1.0	...		
	2000	175	7.8	- 0.7	+ 7.7	...	2000	238	1.6	+ 1.3	+ 0.8	...		
	1750	169	6.5	- 1.2	+ 6.4	...	1750	312	2.4	+ 1.8	- 1.6	...		
	1500	169	10.8	- 2.0	+ 10.6	...	1500	284	3.6	+ 3.5	- 0.9	...		
	1250	172	9.3	- 1.3	+ 9.2	...	1250	275	4.3	+ 4.3	- 0.4	...		
	1000	176	7.5	- 0.5	+ 7.5	...	1000	274	4.2	+ 4.2	- 0.3	...		
	750	170	13.1	- 2.3	+ 12.9	...	750	289	4.6	+ 4.3	- 1.5	...		
	500	166	11.7	- 2.8	+ 11.4	...	500	311	6.4	+ 4.8	- 4.2	...		
100 m. above ground. Anemometer.	170	166	13.1	- 3.1	+ 12.7	...	170	293	1.5	+ 1.4	- 0.6	...		
	105	158	2.0	- 0.4	+ 2.0	...	105	315	1.0	+ 0.7	- 0.7	...		
Computed for M.S.L.	(at 13 h.)	163	9.8	- 2.9	+ 9.4	...	(at 7 h.)	...	...	...	...	...
	(at 18 h.)	177	4.4	- 0.2	+ 4.4	...								
SOUTH FARNBOROUGH. P. 88. July 10. 7 h. 15 m. G.M.T.							SOUTH FARNBOROUGH. P. 89. July 11. 9 h. 25 m. G.M.T.							
Greatest height.	11445	...	...	...	...	Clear. Cloudless, but little Cu. forming after ascent. Sun on balloon revealed it as bright point. Lost in distance. Pressure Distribution (7 h.). High over North Sea. Low 1500 km. W.S.W.	5125	...	...	...	...	Hazy. Ci. and Ci.-St. moving from S.S.W. Balloon appeared very hazy for a time, then becoming more distinct. Pressure Distribution (7 h.). High centred 1400 km. N. Low centred 1400 km. W.
	11375	175	3.3	- 0.3	+ 3.3		
	11000	181	3.8	+ 0.1	+ 3.8		
	10500	199	7.0	+ 2.3	+ 6.6		
	10000	193	8.4	+ 1.9	+ 8.2		
	9500	190	8.9	+ 1.5	+ 8.7		
	9000	190	7.7	+ 1.3	+ 7.6		
	8500	190	6.3	+ 1.1	+ 6.2		
	8000	176	6.6	- 0.5	+ 6.6		
	7500	167	5.0	- 1.1	+ 4.9		
	7000	190	4.7	+ 0.8	+ 4.6	...	...	...	...	...	...
	6500	182	2.6	+ 0.1	+ 2.6	...	...	...	...	...	...
	6000	197	3.4	+ 1.0	+ 3.2	...	...	...	...	...	...
	5500	188	3.0	+ 0.4	+ 2.9	...	...	...	...	...	...
	5000	178	3.5	- 0.1	+ 3.5	...	5000	162	8.4	- 2.6	+ 8.0	...		
	4500	180	3.2	- 0.0	+ 3.2	2.4	4500	174	7.0	- 0.7	+ 6.9	...		
	4000	156	1.9	- 0.8	+ 1.8	...	4000	180	5.9	0	+ 5.9	...		
	3500	60	2.4	- 2.1	- 1.2	...	3500	205	2.4	+ 1.0	+ 2.1	...		
	3000	56	3.9	- 3.2	- 2.2	...	3000	171	3.3	- 0.5	+ 3.2	...		
	2500	63	2.7	- 2.4	- 1.2	...	2500	181	5.3	+ 0.1	+ 5.3	...		
	2000	77	4.8	- 4.7	- 1.1	...	2000	168	5.3	- 1.1	+ 5.2	...		
	1750	69	5.0	- 4.6	- 1.8	...	1750	169	3.2	- 0.6	+ 3.1	...		
	1500	77	4.8	- 4.7	- 1.1	...	1500	151	3.3	- 1.6	+ 2.9	...		
	1250	101	4.9	- 4.8	+ 0.9	...	1250	130	3.7	- 2.8	+ 2.3	...		
	1000	105	6.6	- 6.4	+ 1.7	...	1000	126	4.8	- 3.9	+ 2.8	...		
	750	112	6.4	- 5.9	+ 2.4	...	750	122	7.1	- 6.0	+ 3.8	...		
	500	136	7.2	- 5.0	+ 5.1	...	500	119	6.8	- 5.9	+ 3.3	...		
100 m. above ground. Anemometer.	170	135	3.0	- 1.9	+ 1.9	...	170	70	3.0	- 2.8	- 1.0	...		
	105	135	1.0	- 0.7	+ 0.7	...	105	68	1.0	- 0.9	- 0.4	...		
Computed for M.S.L.	(at 7 h.)	128	6.8	- 5.4	+ 4.2	...	(at 7 h.)	122	4.6	- 3.9	+ 2.4	...		

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.

Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 90. July 14. 7 h. 0 m. G.M.T.								SOUTH FARNBOROUGH. P. 91. July 16. 6 h. 55 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	3495	...	...	...	...	...	2075	...	...	...	...	...	Clear.
	3425	216	14'0	+8'2	+11'3	...	...	...	...	...	...	...	Al.-St. ₉ , with some detached pieces of lower cloud into which the balloon disappeared.
	3000	203	11'7	+4'6	+10'7	...	...	...	...	...	...	...
	2500	194	10'2	+2'4	+9'9	...	...	...	...	...	...	...
	2000	195	8'5	+2'2	+8'2	...	2000	306	7'0	+5'7	-4'1	...	Pressure Distribution (7 h.).		
	1750	199	12'8	+4'2	+12'1	...	1750	302	7'1	+6'0	-3'7	...			
	1500	197	15'0	+4'5	+14'3	...	1500	298	8'0	+7'0	-3'8	...	Shallow Low over North Sea. High to S.W. extending over Azores.		
	1250	195	13'1	+3'4	+12'7	2'4	1250	293	7'9	+7'2	-3'1	2'4			
	1000	196	11'1	+3'0	+10'7	...	1000	299	7'2	+6'3	-3'5	...			
	750	198	11'2	+3'4	+10'7	...	750	303	7'6	+6'4	-4'1	...			
	500	190	11'2	+1'9	+11'1	...	500	304	8'8	+7'3	-4'9	...			
100 m. above ground. Anemometer.	170	160	7'5	-2'5	+7'0	...	170	280	5'2	+5'1	-0'9	...			
	105	146	5'0	-2'8	+4'1	...	105	237	3'0	+2'5	+1'6	...			
Computed for M.S.L.	(at 7 h.)	203	7'6	+3'0	+7'0	...	(at 7 h.)	302	8'1	+6'7	-4'3	...	...
SOUTH FARNBOROUGH. P. 93. July 20. 18 h. 55 m. G.M.T.								SOUTH FARNBOROUGH. P. 94. July 21. 9 h. 50 m. G.M.T.							
Greatest height.	3000	...	...	...	...	...	2075	...	...	...	...	...	Fairly clear.
	2925	127	12'8	-10'2	+7'7	...	...	...	...	...	...	...	Al.-St. ₁₀ in which balloon was lost. Some Ci.-Cu. before ascent observed moving from E.N.E.
	2500	131	11'3	-8'6	+7'4	...	...	...	...	...	...	...
	2000	134	10'3	-7'4	+7'1	...	2000	83	7'0	-6'9	-0'9	...	Pressure Distribution (7 h.).		
	1750	135	10'7	-7'5	+7'6	...	1750	100	6'3	-6'2	+1'1	...			
	1500	141	9'2	-5'8	+7'1	...	1500	103	3'6	-3'5	+0'8	...	Shallow Low 800 km. S. Well-defined High centred 2400 km. W.S.W., but only slight gradients over Europe.		
	1250	167	5'1	-1'2	+5'0	2'4	1250	353	0'8	+0'1	-0'8	2'4			
	1000	175	3'6	-0'3	+3'6	...	1000	12	2'4	-0'5	-2'3	...			
	750	168	3'3	-0'7	+3'2	...	750	5	3'5	-0'3	-3'5	...			
	500	155	4'0	-1'7	+3'6	...	500	17	2'4	-0'7	-2'3	...			
100 m. above ground. Anemometer.	170	153	3'1	-1'4	+2'8	...	170	345	1'9	+0'5	-1'8	...			
	105	...	0	0	0	...	105	...	?	?	...	...	
Computed for M.S.L.	(at 18 h.)	154	6'7	-2'9	+6'0	...	(at 7 h.)	...	...	...	...	...	...
SOUTH FARNBOROUGH. P. 95. July 22. 7 h. 0 m. G.M.T.								SOUTH FARNBOROUGH. P. 97. July 25. 6 h. 50 m. G.M.T.							
Greatest height.	2500	...	...	...	...	...	3210	...	...	...	...	...	Clear.
	...	...	...	...	...	...	3000	286	20'0	+19'2	-5'5	...	Ci.-St. ₅ and Cu. low down in N.W. at first, then rapidly becoming overcast with St.-Cu. Balloon very distinct against Ci.-St. background, and lost in lower cloud.
	2430	193	2'3	+0'5	+2'2	...	2500	290	13'8	+13'0	-4'6	...			
	2000	261	3'3	+3'2	+0'5	...	2000	287	14'3	+13'7	-4'1	...			
	1750	277	2'4	+2'4	-0'3	...	1750	290	14'3	+13'5	-4'8	...			
	1500	259	1'0	+1'0	+0'2	...	1500	288	13'8	+13'1	-4'1	...			
	1250	157	0'8	-0'3	+0'7	2'4	1250	288	14'9	+14'1	-4'7	2'4	Pressure Distribution (7 h.).		
	1000	258	2'4	+2'3	+0'5	...	1000	292	14'3	+13'2	-5'4	...	Well-defined but deformed Low centred 1300 km. N.N.E. influencing Europe. High to W. of Ireland.		
	750	280	5'3	+5'2	-0'9	...	750	294	13'9	+12'6	-5'7	...			
	500	275	8'8	+8'8	-0'7	...	500	289	12'2	+11'5	-3'9	...			
100 m. above ground. Anemometer.	170	281	3'2	+3'1	-0'6	...	170	265	5'0	+5'0	+0'4	...			
	105	?	?	?	?	...	105	259	8'0	+7'8	+1'5	...			
Computed for M.S.L.	(at 7 h.)	337	3'7	+1'4	-3'4	...	(at 7 h.)	297	11'3	+10'1	-5'1	...	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 98. July 31. 9 h. 30 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.			
				W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	Hazy. Thin uniform sheet of high cloud through which sun was visible. Balloon very distinct until lost in distant haze. <i>Pressure Distribution (7 h.).</i> High centred 500 km. S.E. Well-defined Low 1700 km. W.N.W.	
	6335	...	...	...	...
	6265	207	8.2	+ 3.7	+ 7.3		
	6000	206	8.4	+ 3.7	+ 7.5		
	5500	206	6.3	+ 2.7	+ 5.6		
	5000	210	7.3	+ 3.6	+ 6.3		
	4500	204	6.9	+ 2.8	+ 6.3		
	4000	197	8.0	+ 2.3	+ 7.6		
	3500	203	7.4	+ 2.9	+ 6.8		
	3000	205	6.9	+ 2.9	+ 6.2		
	2500	171	5.7	- 0.9	+ 5.6		
	2000	195	4.7	+ 1.2	+ 4.5		
	1750	181	5.8	+ 0.1	+ 5.8		
	1500	177	6.7	- 0.4	+ 6.7		
	1250	168	7.6	- 1.6	+ 7.4		
	1000	167	8.3	- 1.9	+ 8.0		
	750	173	7.7	- 0.9	+ 7.6		
	500	181	5.8	+ 0.1	+ 5.8		
100 m. above ground. Anemometer.	170	164	9.5	- 2.6	+ 9.1		
	105	158	3.0	- 1.1	+ 2.8		
Computed for M.S.L.	(at 7 h.)	204	9.9	+ 4.0	+ 9.0	...	

Note.—In addition to the ascents tabulated above, pilot balloons which were lost sight of before reaching a height of 2 km. were sent up from Eskdalemuir on one occasion and from South Farnborough on three occasions during the month.

9. The Upper Air: Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. July 2. 7 h. 6 m. G.M.T.				SOUNDING No., 291.		Height above M.S.L.	Pressure.	Temperature.		REMARKS.
GREATEST HEIGHT,	Height above M.S.L.	Pressure.	Temp.	PLACE, BENSON.				km.	mb.		Reading.	Fall per Km.
				LOWEST TEMPERATURE,	11.3 km.	224 mb.	218° A.			Latitude, 51° 37'	Longitude, 1° 7' W.	14.0	150	230	-5 -2	Low clouds formed rapidly during the ascent. H_{c} at 11.3 km. at 218° A. on one trace, 11.1 km. at 223° A. on the other. Note.—The two sets of temperatures and two traces referred to give the ascending and descending readings from one and the same instrument.
BASE OF STRATOSPHERE,	11.2 km.	229 mb.	221° A.	Height above M.S.L., } 57 m.	PLACE OF FALL, Belgrave, (Leicester).	13.0	173	225 228	-3 -4	
Type	No. 1.			Distance, 115 km.	Orientation, 0° from N.	12.03	200	222 224	-3 -1	
						12.0	202	...		
						11.0	235	219 223	7 5	
						10.0	273	226 228		
						9.35	300	232 234	9 9	
						9.0	318	235 237	8 8	
						8.0	364	243 245		
						7.31	400	248 250	8 7	
From observations at Station			at 7 h.	at 18 h. G.M.T.		6.0	478	259		
PRESSURE (M.S.L.),			1004 mb.	1004 mb.		5.66	500	260	4	
TEMPERATURE,			295° A.	293.5° A.		5.0	546	263	8	
VAPOUR PRESSURE,			...	...		4.24	600	270	
GRADIENT WIND:—Direction,			236°	270°		4.0	619	271	7	
Velocity,			5.7 m/s.	3.4 m/s.		3.02	700	278		
Correction for Curvature,			-0.7 m/s.	-0.7 m/s.		3.0	701	...		
Final Components, { W. to E.			+4.7 m/s.	+3.4 m/s.		2.0	792	284	6	
{ S. to N.			+3.2 m/s.	0 m/s.		1.92	800	284	6	
						1.0	892	290		
						.93	900	290	5	
						.03	1000	295		
						Ground M.S.L.	997	295	...	
							1004	...	...

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.-E.		S.-N.
1	St.-Cu.	225	m/s.	m/s.	m/s.	Fused sheet of St.-Cu.
2	Cu.-Nb.	177	5.0	+ 3.5	+ 3.5	Fracto Cu.-Nb. Thunder and thunder showers had [just occurred.
4	St.-Cuf.	90	9.3	- 0.5	+ 9.3	
9	Ci.-Cu.	231	12.5	-12.5	0	Heavy Cu.-Nb. mass in N.W.
15	Ci.	166	2.8	+ 2.2	+ 1.8	Coarse Ci. to Ci.-St. Observation at 12 h.
18	Ci.-Cu. to A.-Cu.	210	3.6	- 0.9	+ 3.5	Thin flat A.-Cu. to Ci.-Cu.
21	A.-Cu.	255	2.5	+ 1.2	+ 2.2	
22	Cu.	291	2.9	+ 2.8	+ 0.8	
23	Cu.-Nb.	264	5.0	+ 4.7	- 1.8	Low loose type of Cu.-Nb.
24	Cu.	288	8.9	+ 8.9	+ 0.6	Degraded sheet of Cu.
28	Cu.	358	12.0	+11.4	- 3.7	Degraded sheet of Cu.
29	Cu.	350	16.0	+ 0.5	-16.0	Low sheet of Cu.
30	St.-Cu.	264	10.0	+ 1.7	- 9.8	This sheet of St.-Cu. had been backing in direction [all morning.
31	Ci.	212	6.0	+ 5.9	+ 0.6	Diffused Ci. to Ci.-St., with ⊕.
			1.7	+ 0.9	+ 1.4	

For Notes (1) Tables of Upper Air Results, and (2) Cloud Observations at Aberdeen, see page 6.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H = 5.5 m. Barometer, H_b = 10.4 m. Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Sunshine Recorder, h_s = 13.3 m. Cups of Anemometer, h_a = 20 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Milliwatts per cm.², Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground. Includes daily data from 1 to 31 and means.

4. ESKDALEMUIR OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H = 242.0 m. Barometer, H_b = 237.3 m. Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Sunshine Recorder, h_s = 1.5 m. Vane of Anemometer, h_a = 15 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground. Includes daily data from 1 to 31, means, and normals. Includes a REMARKS column with detailed weather observations.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.), unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table for HOLYHEAD and DEERNESS. Includes columns for Date, 3h, 9h, 15h, 21h, Max. in a Gust, and Time of Gust. Sub-headers include S, N, W, E for wind direction and V, Hrs, Min for velocity and time.

Table for SCILLY and GREAT YARMOUTH. Includes columns for Date, 3h, 9h, 15h, 21h, Max. in a Gust, and Time of Gust. Sub-headers include S, N, W, E for wind direction and V, Hrs, Min for velocity and time.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time.
+ Robinson Cup Anemometer; Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.8.
§ Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube.
The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.
Soundings by Kites (K.) and Pilot Balloons (P.).

BRIGHTON. K. 26. August 6. 10 h. 0 m. to 12 h. 10 m. G.M.T.

Soundings with Kites.	Height above M.S.L.	Pressure.	Temperature.		Humidity.	Density of Atmosphere.	Wind.		Cloud Observations and Remarks.	
			Reading.	Fall per km.			Direction.	Velocity.		
Greatest height.	metres. 1000	mb. 898.5	°A. 282	°C. 6.0	% 80	mb. 6.8	mgm/cc. 1.105	Degrees from N. 250	m/s. 12	Half overcast. Cu. and Fr.-Cu. Scud about 300 m. above ground.
	500	954.0	285	8.8	90	9.4	1.161	250	12	
	215	986.8	287.5		80	9.8	1.190	250	18	
Ground level.	115	998.5	290		74	10.7	1.193	250	12	
Computed for M.S.L.	(at 13 h.)	1010.9	...	...	...	...	...	258	15.3	...

ESKDALEMUIR. P. 65. August 12. 15 h. 31 m. G.M.T.

ESKDALEMUIR. P. 66. August 13. 10 h. 34 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.				
				W.-E.	S.-N.			
Greatest height.	metres. 4025	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Cirrus moving from S.W. Final elevation 17° 5'. Balloon lost in distance. Pressure Distribution (18 h.). High-pressure system over North Sea between depressions over N.W. Russia and East Atlantic respectively.	
	3500	249	13.9	+13.0	+5.0	2.3		
	3000	236	13.5	+11.2	+7.6			
	2500	234	8.7	+7.0	+5.1			
	2000	222	6.4	+4.3	+4.7			
	1750	213	5.6	+3.0	+4.7			
	1500	188	3.5	+0.5	+3.4			
	1250	180	3.4	0	+3.4			
	1000	187	4.0	+0.5	+3.9			
	750	225	2.4	+1.7	+1.7			
	500	225	2.3	+1.6	+1.6			
100 m. above ground. Anemometer.	340	225	1.7	+1.2	+1.2			
	250	198	1.0	+0.3	+0.9			
Computed for M.S.L.	(at 13 h.) (at 18 h.)	165 147	8.9 6.3	-2.3 -3.4	+8.6 +5.3	...	Wt. of balloon 19.5 gms. Free lift 45 gms.	

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.				
				W.-E.	S.-N.			
Greatest height.	metres. 3000	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Ci. moving from W. Balloon burst at a final elevation of 34° 1'. Pressure Distribution (7 h.). Extensive irregular high-pressure system with its axis running N.W.-S.E. across the North Sea. Shallow depressions in N.W. Russia and East Atlantic respectively.	
	2500	227	5.4	+3.9	+3.7	2.3		
	2000	175	3.1	-0.3	+3.1			
	1750	192	3.7	+0.8	+3.6			
	1500	163	4.0	-1.2	+3.8			
	1250	138	6.6	-4.4	+4.9			
	1000	121	4.8	-4.1	+2.5			
	750	132	4.8	-3.6	+3.2			
	500	134	4.7	-3.4	+3.3			
	340	138	5.1	-3.4	+3.7			
	250	130	3.5	-2.7	+2.2			
Computed for M.S.L.	(at 7 h.) (at 13 h.)	162 170	10.5 13.3	-3.3 -2.3	+10.0 +13.1	...	Wt. of balloon 19.4 gms. Free lift 45 gms.	

ESKDALEMUIR. P. 67. August 14. 10 h. 17 m. G.M.T.

ESKDALEMUIR. P. 69. August 20. 10 h. 23 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.				
				W.-E.	S.-N.			
Greatest height.	metres. 4150	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Ci. moving from W.N.W. Final elevation 30° 8'. Balloon disappeared from view. Pressure Distribution (7 h.). High-pressure system with axis running N.N.W.-S.S.E. across the North Sea, between depressions centred over Petrograd and the East Atlantic respectively.	
	4000	203	2.5	+1.0	+2.3	2.0		
	3500	218	4.2	+2.6	+3.3			
	3000	205	5.1	+2.1	+4.6			
	2500	196	4.4	+1.2	+4.2			
	2000	202	4.5	+1.7	+4.1			
	1750	198	6.9	+2.1	+6.5			
	1500	131	3.2	-2.4	+2.1			
	1250	123	4.2	-3.5	+2.3			
	1000	125	5.5	-4.5	+3.1			
	750	131	3.5	-2.6	+2.3			
	500	142	3.6	-2.2	+2.8			
100 m. above ground. Anemometer.	340	158	2.7	-1.0	+2.5			
	250	157	1.0	-0.4	+0.9			
Computed for M.S.L.	(at 7 h.) (at 13 h.)	153 170	13.9 9.8	-6.3 -1.7	+12.3 +9.7	...	Wt. of balloon 18.6 gms. Free lift 30 gms.	

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.				
				W.-E.	S.-N.			
Greatest height.	metres. 2700	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Very misty. Balloon disappeared in mist. Pressure Distribution (7 h.). Irregular high-pressure system over Western Europe and East Atlantic.	
	2500	198	4.1	+1.3	+3.9	2.6		
	2000	233	2.7	+2.1	+1.6			
	1750	238	3.2	+2.7	+1.7			
	1500	222	3.3	+2.2	+2.4			
	1250	220	3.1	+2.0	+2.4			
	1000	180	2.4	0	+2.4			
	750	220	3.3	+2.1	+2.5			
	500	225	1.7	+1.2	+1.2			
	340	153	0.7	-0.3	+0.6			
	250	102	1.0	-1.0	+0.2			
Computed for M.S.L.	(at 7 h.) (at 13 h.)	...	Indefinite.	Wt. of balloon 19.4 gms. Free lift 73 gms.	

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*
 Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 70. August 27. 7 h. 24 m. G.M.T.							ESKDALEMUIR. P. 71. August 29. 12 h. 48 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	5900	2800	Ci., Cu. ₃ Clear atmosphere. Balloon lost at elevation of 13° 7' owing to passage of Cu.	
	5500	68	8.2	- 7.6	- 3.1	} 2.0 Pressure Distribution (7 h.). Station is North of centre of irregular high-pressure system with low gradients Depression centred N.W. of Iceland.	
	5000	47	8.2	- 6.0	- 5.6	...	...	...	...	...	...	...
	4500	53	7.8	- 6.2	- 4.7	...	...	...	...	...	...	...
	4000	63	5.3	- 4.7	- 2.4	...	...	...	...	...	...	...
	3500	78	3.7	- 3.6	- 0.8	...	...	...	...	...	...	...
	3000	90	1.1	- 1.1	0	...	...	...	...	...	...	...
	2500	4	1.5	- 0.1	- 1.5	...	2500	210	15.8	+ 7.9	+ 13.6	...		
	2000	9	0.6	- 0.1	- 0.6	...	2000	210	13.1	+ 6.5	+ 11.3	...		
	1750	50	1.6	- 1.2	- 1.0	2.4	1750	219	8.3	+ 5.2	+ 6.5	...		
	1500	18	1.0	- 0.3	- 0.9	...	1500	214	4.1	+ 2.3	+ 3.4	...		
	1250	355	1.2	+ 0.1	- 1.2	...	1250	224	4.2	+ 2.9	+ 3.0	...		
	1000	45	0.3	- 0.2	- 0.2	...	1000	213	3.5	+ 1.9	+ 2.9	...		
	750	135	0.3	- 0.2	+ 0.2	...	750	212	2.5	+ 1.3	+ 2.1	...		
	500	149	0.6	- 0.3	+ 0.5	...	500	227	2.2	+ 1.6	+ 1.5	...		
100 m. above ground. Anemometer.	340	153	0.4	- 0.2	+ 0.4	...	340	239	2.1	+ 1.8	+ 1.1	...		
	250	...	0.0	0.0	0.0	...	250	247	2.1	+ 1.9	+ 0.8	...		
Computed for M.S.L.	(at 7 h.)	160	6.2	- 2.2	+ 5.8	...	(at 13 h.)	No definite measurable gradient.				...	Wt. of balloon 8.6 gms. Free lift 20.9 gms.	
SOUTH FARNBOROUGH. P. 99. August 7. 9 h. 5 m. G.M.T.							SOUTH FARNBOROUGH. P. 100. August 10. 18 h. 0 m. G.M.T.							
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	3495	4915	Clear. Ci.; Ci.-Cu., Cu. ₆ Ci. moving from S. Balloon lost in low Cu.	
	3425	243	14.1	+ 12.6	+ 6.3	...	4845	238	19.0	+ 16.2	+ 10.0	...	} 2.4 Pressure Distribution (18 h.). Station in irregular high-pressure system. Depression between Faroes and Iceland.	
	3000	250	14.6	+ 13.7	+ 5.0	...	4500	242	18.9	+ 16.6	+ 8.9	...		
	2500	248	12.6	+ 11.8	+ 4.7	...	4000	236	20.5	+ 17.1	+ 11.3	...		
	2000	277	8.7	+ 8.6	- 1.1	...	3500	237	21.4	+ 17.7	+ 12.0	...		
	1750	282	8.7	+ 8.5	- 1.8	...	3000	241	17.3	+ 15.3	+ 8.1	...		
	1500	275	6.3	+ 6.3	- 0.6	2.4	2500	240	16.7	+ 14.5	+ 8.3	...		
	1250	281	4.7	+ 4.6	- 0.9	...	2000	239	15.7	+ 13.5	+ 8.1	...		
	1000	286	4.5	+ 4.3	- 1.2	...	1750	241	11.9	+ 10.4	+ 5.7	...		
	750	284	5.7	+ 5.5	- 1.4	...	1500	250	10.7	+ 10.0	+ 3.7	...		
	500	276	6.0	+ 6.0	- 0.6	...	1250	267	5.9	+ 5.9	+ 0.3	...		
100 m. above ground. Anemometer.	170	279	3.6	+ 3.6	- 0.6	...	1000	301	3.9	+ 3.3	- 2.0	...		
	105	270	2.0	+ 2.0	0.0	...	750	299	3.9	+ 3.4	- 1.9	...		
Computed for M.S.L.	(at 7 h.)	257	6.4	+ 6.2	+ 1.4	...	(at 18 h.)	295	4.8	+ 4.3	- 2.0
	(at 13 h.)	280	6.6	+ 6.5	- 1.1
SOUTH FARNBOROUGH. P. 101. August 11. 7 h. 30 m. G.M.T.							SOUTH FARNBOROUGH. P. 102. August 12. 7 h. 5 m. G.M.T.							
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	2785	3775	Hazy but cloudless. Balloon passed out of azimuth range of theodolite.	
	2715	259	9.0	+ 8.8	+ 1.7	...	3705	250	8.4	+ 7.9	+ 2.9	...	} 2.4 Pressure Distribution (7 h.). Station near centre of extensive high-pressure system. Shallow depression in East Atlantic.	
	2500	266	7.6	+ 7.6	+ 0.5	...	3500	262	7.2	+ 7.1	+ 1.0	...		
	2000	267	7.1	+ 7.1	+ 0.4	...	3000	253	7.0	+ 6.6	+ 2.1	...		
	1750	283	7.0	+ 6.8	- 1.6	...	2500	237	5.3	+ 4.4	+ 2.9	...		
	1500	284	6.4	+ 6.2	- 1.6	...	2000	217	3.7	+ 2.2	+ 2.9	...		
	1250	307	4.7	+ 3.7	- 2.8	2.4	1750	184	1.3	+ 0.1	+ 1.3	...		
	1000	340	2.7	+ 0.9	- 2.5	...	1500	137	2.0	- 1.3	+ 1.4	...		
	750	20	2.3	- 0.8	- 2.2	...	1250	109	3.4	- 3.2	+ 1.1	...		
	500	17	2.0	- 0.6	- 1.9	...	1000	101	7.0	- 6.9	+ 1.3	...		
100 m. above ground. Anemometer.	170	330	0.8	+ 0.4	- 0.7	...	750	102	11.3	- 11.0	+ 2.3	...		
	105	...	0.0	0.0	0.0	...	500	104	10.1	- 9.8	+ 2.4	...		
Computed for M.S.L.	(at 7 h.)	No measurable gradient.				...	(at 7 h.)	110	12.2	+ 11.5	+ 4.2

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.

Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 103. August 13. 9 h. 45 m. G.M.T.							SOUTH FARNBOROUGH. P. 104. August 14. 14 h. 35 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	6830	...	...	...	...	...	6615	...	...	...	...	...	Clear.
	6760	201	4.8	+ 1.7	+ 4.4		...	...	...	...	...	...	Small bank of cloud seen to W.S.W. remaining stationary, thus probably high cloud, although appearing of Cu. type.
	6500	233	3.9	+ 3.1	+ 2.3		6500	259	5.0	+ 4.9	+ 1.0		The under parts were quite in shadow.	
	6000	191	2.7	+ 0.5	+ 2.6		6000	243	5.6	+ 5.0	+ 2.5		Balloon lost by azimuth screw coming out of engagement.	
	5500	203	1.3	+ 0.5	+ 1.2		5500	242	4.1	+ 3.6	+ 1.9			
	5000	360	2.8	0.0	- 2.8		5000	215	3.0	+ 1.7	+ 2.4			
	4500	357	1.8	+ 0.1	- 1.8		4500	129	3.3	- 2.6	+ 2.1			
	4000	275	2.3	+ 2.3	- 0.2		4000	122	4.4	- 3.7	+ 2.3			
	3500	286	1.8	+ 1.7	- 0.5		3500	121	5.3	- 4.5	+ 2.7			
	3000	300	3.6	+ 3.1	- 1.8		3000	113	5.8	- 5.3	+ 2.3			
	2500	360	4.0	0.0	- 4.0	2.4	2500	120	4.8	- 4.1	+ 2.4	2.4	Pressure Distribution (18 h.).	
	2000	55	1.7	- 1.4	- 1.0		2000	125	3.0	- 2.4	+ 1.7			
	1750	...	0	0.0	0.0		1750	139	2.0	- 1.3	+ 1.5		High-pressure system with axis running N.N.W.-S.S.E. across the North Sea, between depressions centred over Petrograd and the East Atlantic respectively.	
	1500	185	1.2	+ 0.1	+ 1.2		1500	150	5.5	- 2.8	+ 4.8			
	1250	162	2.2	- 0.7	+ 2.1		1250	142	4.4	- 2.7	+ 3.4			
	1000	114	4.2	- 3.8	+ 1.7		1000	116	5.9	- 5.3	+ 2.6			
	750	114	6.2	- 5.6	+ 2.5		750	112	7.2	- 6.6	+ 2.7			
	500	111	4.3	- 4.0	+ 1.5		500	104	7.6	- 7.4	+ 1.8			
100 m. above ground.	170	66	2.4	- 2.2	- 1.0		170	87	3.6	- 3.6	- 0.2			
Anemometer.	105	95	2.0	- 2.0	+ 0.2		105	90	4.0	- 4.0	0.0			
Computed for M.S.L.	(at 7 h.)	121	13.7	- 11.9	+ 7.0	...	(at 13 h.)	138	9.9	- 6.6	+ 7.3	...	...
	(at 13 h.)	121	19.2	- 16.5	+ 9.9	...	(at 18 h.)	139	5.7	- 3.7	+ 4.3	...	...
SOUTH FARNBOROUGH. P. 105. August 18. 6 h. 55 m. G.M.T.							SOUTH FARNBOROUGH. P. 106. August 20. 7 h. 0 m. G.M.T.							
Greatest height.	4630	...	...	...	...		3350	...	...	...	...		Mist, in which balloon was lost. Little Ci.-Cu. moving slowly from W.
	4500	52	6.4	- 5.0	- 3.9		...	...	...	...	...
	4000	53	3.7	- 2.9	- 2.2		...	...	...	...	...
	3500	57	3.9	- 3.2	- 2.1		...	...	...	...	...
	3000	30	5.4	- 2.7	- 4.6		...	...	...	...	...
	2500	29	4.4	- 2.1	- 3.8		3280	267	2.2	+ 2.2	+ 0.1			
	2000	25	1.9	- 0.8	- 1.7		3000	317	2.1	+ 1.4	- 1.5		Pressure Distribution (7 h.).	
	1750	24	4.7	- 1.9	- 4.2		2500	330	7.8	+ 3.9	- 6.7	2.4		
	1500	27	6.4	- 2.9	- 5.7	2.4	2000	312	6.8	+ 5.0	- 4.5		Irregular high-pressure system over Western Europe and East Atlantic.	
	1250	23	8.3	- 3.2	- 7.7		1250	354	1.8	+ 0.2	- 1.8			
	1000	19	6.6	- 2.2	- 6.2		1000	330	0.8	+ 0.4	- 0.7			
	750	15	5.6	- 1.5	- 5.4		750	270	0.6	+ 0.6	0.0			
	500	42	5.3	- 3.5	- 3.9		500	150	1.4	- 0.7	+ 1.2			
100 m. above ground.	170	51	2.8	- 2.2	- 1.8		170	...	...	?	?	
Anemometer.	105	...	0.0	0.0	0.0		105	...	0.0	0.0	0.0			
Computed for M.S.L.	(at 7 h.)	Gradient indeterminate.					...	(at 7 h.)	No measurable gradient.					...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 107. August 21. 6 h. 55 m. G.M.T.								SOUTH FARNBOROUGH. P. 108. August 21. 11 h. 20 m. G.M.T.									
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.			
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.						
				W.-E.	S.-N.						W.-E.	S.-N.					
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Slight mist. A.-Cu. ₈ in which balloon disappeared.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Clear. Cu. ₅ at first, clearing slightly. Ascent made during solar eclipse. The clearing of the Cu. may have been due to loss of solar radiation. Balloon disappeared in Cu.			
	2995	...	...	...	...	...	<i>Pressure Distribution.</i> Irregular high-pressure system with low gradients over Western Europe. Approaching depression in East Atlantic.	2640	...	...	...	...	* See 6 h. 55 m. ascent.	
	2925	268	5'0	+ 5'0	+ 0'2	2500		248	4'5	+ 4'1	+ 1'7	2000		258	3'4	+ 3'3	+ 0'7
	2500	260	5'8	+ 5'7	+ 1'0	1750		257	3'6	+ 3'5	+ 0'8	1500		263	4'7	+ 4'6	+ 0'6
	2000	264	4'9	+ 4'9	+ 0'5	1250		261	5'3	+ 5'2	+ 0'8	1000		267	5'1	+ 5'1	+ 0'3
	1750	260	4'6	+ 4'5	+ 0'8	750		262	4'2	+ 4'2	+ 0'6	500		262	3'8	+ 3'7	+ 0'5
	1500	256	5'1	+ 5'0	+ 1'2	170		257	2'2	+ 2'1	+ 0'5	105		260	2'0	+ 2'0	+ 0'3
	1250	247	5'1	+ 4'7	+ 2'0
	1000	253	5'2	+ 5'0	+ 1'5
	750	256	4'5	+ 4'3	+ 1'1
100 m. above ground. Anemometer.	500	259	3'8	+ 3'7	+ 0'8
	170	272	3'7	+ 3'7	- 0'1		
	105	...	0'0	0'0	0'0		
Computed for M.S.L.	(at 7 h.)	270±	3'5	+ 3'5	0	...	...	(at 13 h.)	<i>Gradient indeterminate.</i>				...		
SOUTH FARNBOROUGH. P. 110. August 21. 17 h. 35 m. G.M.T.								SOUTH FARNBOROUGH. P. 112. August 27. 7 h. 5 m. G.M.T.									
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Clear. Cu. banks in different directions near horizon, and Ci. over head moving from W.N.W. Balloon lost in distance.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Clear. A.-Cu. ₄ . Low Fr.-Cu. formed later, and sky became overcast at 7 h. 45 m. Balloon disappeared in Fr.-Cu.			
	6050	...	...	...	...	...	<i>Pressure Distribution.</i> See 6 h. 55 m. ascent.	3495	...	...	...	...	* Station in col between high-pressure systems lying over Northern Scandinavia and the Azores respectively. Deep depression centred S.W. of Iceland.	
	5980	289	11'3	+ 10'7	- 3'6	...		...	...	...	...	...		...
	5500	287	11'0	+ 10'5	- 3'3	...		...	...	...	...	...		...
	5000	297	9'0	+ 8'0	- 4'1	...		...	...	...	...	...		...
	4500	286	9'5	+ 9'1	- 2'7	...		...	...	...	...	...		...
	4000	276	7'8	+ 7'8	- 0'8	...		...	...	...	...	...		...
	3500	282	5'6	+ 5'5	- 1'2	...		...	...	...	...	...		...
	3000	254	5'5	+ 5'3	+ 1'5	...		...	...	...	...	...		...
	2500	281	4'6	+ 4'5	- 0'9	...		...	...	...	...	...		...
	2000	282	7'9	+ 7'7	- 1'7	...		...	...	...	...	...		...
	1750	283	6'7	+ 6'5	- 1'5	...	...	...	...	...	...	...
	1500	282	6'4	+ 6'2	- 1'3	...	...	...	...	...	...	...
	1250	275	7'4	+ 7'4	- 0'6	...	...	...	...	...	...	...
	1000	271	7'0	+ 7'0	- 0'1	...	...	...	...	...	...	...
	750	266	7'4	+ 7'4	+ 0'5	...	...	...	...	...	...	...
	500	262	7'2	+ 7'1	+ 1'0	...	...	...	...	...	...	...
100 m. above ground. Anemometer.	170	245	5'4	+ 4'9	+ 2'3	...	...	...	...	...	...	...	...
	105	255	0'5	+ 0'5	+ 0'1	...	...	...	...	...	...	...	...
Computed for M.S.L.	...	<i>No definite measurable gradient.</i>				...	...	(at 7 h.)	334	10'8	+ 4'8	- 9'7	...	...	

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*

Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 113. August 28. 10 h. 15 m. G.M.T.								SOUTH FARNBOROUGH. P. 114. August 29. 6 h. 55 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.						Direction.	Velocity.	Components.				
				W.-E.	S.-N.	m/s.						W.-E.	S.-N.	m/s.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Hazy, but cloudless. Balloon in angular proximity to sun, but passed out of azimuth range of theodolite.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Mist clearing, but still hazy. Little Cl. moving from N.W. at 8 h. Balloon lost in distance and absence of colour contrast.		
	2500	...	...	...	...	...	<i>Pressure Distribution (7 h.).</i> High-pressure system extends from Cornwall to Azores: greatest intensity over Brittany. A second high-pressure area exists over the Baltic, with a col between the two systems. A deep depression is centred S.W. of Iceland.	8320	...	...	...	...	<i>Pressure Distribution (7 h.).</i> Station near centre of extensive irregular high-pressure system. Depression N.W. of Iceland.	
	...	...	...	...	...	2.4		8250	289	7.3	+6.9	-2.4		2.4
	...	...	...	...	...	...		8000	291	7.6	+7.1	-2.8		...
	...	...	...	...	...	...		7500	275	4.4	+4.4	-0.4		...
	...	...	...	...	...	...		7000	270	5.6	+5.6	0.0		...
	...	...	...	...	...	...		6500	313	6.5	+4.7	-4.4		...
	...	...	...	...	...	...		6000	313	5.9	+4.3	-4.0		...
	...	...	...	...	...	...		5500	217	1.5	+0.9	+1.2		...
	...	...	...	...	...	...		5000	227	2.8	+2.0	+1.9		...
	...	...	...	...	...	...		4500	299	2.5	+2.2	-1.2		...
	...	...	...	...	...	...		4000	315	1.9	+1.3	-1.3		...
	...	...	...	...	...	...		3500	324	2.9	+1.7	-2.3		...
	...	...	...	...	...	...		3000	324	3.1	+1.8	-2.5		...
	2430	47	2.8	-2.0	-1.9	...		2500	307	2.0	+1.6	-1.2		...		
	2000	30	3.8	-1.9	-3.3	...		2000	308	2.9	+2.3	-1.8		...		
	1750	25	4.3	-1.8	-3.9	...	1750	297	1.8	+1.6	-0.8	...				
	1500	22	2.7	-1.0	-2.5	...	1500	245	1.7	+1.5	+0.7	...				
	1250	339	2.0	+0.7	-1.9	...	1250	240	3.4	+2.9	+1.7	...				
	1000	342	3.9	+1.2	-3.7	...	1000	236	5.6	+4.6	+3.1	...				
	750	302	4.9	+2.6	-4.1	...	750	221	4.2	+2.8	+3.2	...				
	500	344	2.8	+0.8	-2.7	...	500	212	1.7	+0.9	+1.4	...				
100 m. above ground. Anemometer.	170	323	2.1	+1.3	-1.7	...	170	299	1.2	+1.1	-0.6	...				
	105	...	0.0	0.0	0.0	...	105	...	0.0	0.0	0.0	...				
Computed for M.S.L.	(at 7 h.)	20	9.7	-3.3	-9.1	...	(at 7 h.)	<i>Gradient too indefinite to be measured.</i>					...			
	(at 13 h.)	<i>Indefinite.</i>					...						...
FALMOUTH. P. 69. August 29. 11 h. 15 m. G.M.T.								FALMOUTH. P. 70. August 31. 11 h. 15 m. G.M.T.								
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Cu ₂ . Bright and warm; light sea breeze about noon.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Cloudless. Bright and very warm; light sea breeze about noon.		
	2530	...	...	...	...	...	<i>Pressure Distribution (7 h.).</i> Station at centre of irregular high-pressure system.	2060	...	...	...	...	<i>Pressure Distribution (7 h.).</i> Station in extensive anticyclonic region centred over Scottish border.	
	2500	306	0.4	+0.3	-0.2	1.6		...	...	...	...	...		1.7
	2000	52	1.7	-1.3	-1.0	...		2000	308	1.7	+1.3	-1.0		...		
	1750	73	2.1	-2.0	-0.6	...		1750	351	1.8	+0.3	-1.8		...		
	1500	32	1.9	-1.0	-1.6	...		1500	55	1.2	-1.0	-0.7		...		
	1250	82	0.7	-0.7	-0.1	...		1250	90	1.4	-1.4	0.0		...		
	1000	310	3.0	+2.3	-1.9	...		1000	151	1.3	-0.6	+1.1		...		
	750	351	4.0	+0.6	-3.9	...		750	42	1.2	-0.8	-0.9		...		
	500	241	2.7	+2.3	+1.3	...		500	51	2.0	-1.5	-1.2		...		
100 m. above ground. Anemometer.	151	156	6.0	-2.4	+5.5	...		151	149	3.1	-1.6	+2.7		...		
	63	160	2.9	-1.0	+2.7	...	63	135	2.0	-1.4	+1.4	...				
Computed for M.S.L.	(at 7 h.)	<i>No measurable gradient.</i>					Wt. of balloon 5.5 gms.	(at 7 h.)	<i>No measurable gradient.</i>					Wt. of balloon 5.5 gms.		
	(at 13 h.)	" " "					Free lift 6.5 gms.	(at 13 h.)	" " "					Free lift 9.1 gms.		

Note.—Two pilot balloon ascents of less than two kilometres were recorded at Eskdalemuir and two at South Farnborough during the month.

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. August 21. 11 h. 30 m. G.M.T.	SOUNDING No., 293.			Height above M.S.L.	Pressure.	Temperature.		REMARKS.
	Height above M.S.L.	Pressure.	Temp.			Reading.	Fall per km.	
GREATEST HEIGHT, } 6.6 km.	437 mb.	247° A.	PLACE, BENSON.	km.	mb.	°A.	°C.	
			Latitude, 51° 37' W.	6.00	477	250		
LOWEST TEMPERATURE, } 6.6 km.	437 mb.	247° A.	Longitude, 1° 7' W.	5.64	500	253	7	
			Height above M.S.L., } 57 m.	5.00	544	257		
BASE OF STRATOSPHERE, } ...	...	...	PLACE OF FALL, Bledlow, Bucks.	4.25	600	261	6	
			Distance, 18 km.	4.00	619	263		
Type ?	?	?	Orientation, 64° from N.	3.05	700	269	6	
				3.00	705	269		
From observations at Station.				2.50		272		
PRESSURE (M.S.L.),		at 7 h. 1020 mb.	at 18 h. G.M.T. 1018 mb.	1.98	800	276	7	
TEMPERATURE,		287° A.	291° A.	2.00		276		
VAPOUR PRESSURE, . . . . .		...	...	1.56		851	8	
GRADIENT WIND :—Direction,		270±°	Indefinite.	1.04	900	284		
Velocity,		3.5 m/s.	...	1.00		904	284	
Correction for Curvature,		0 m/s.	...	.50	1000	288	9	
Final Components, { W. to E.		+ 3.5 m/s.	...	Ground M.S.L.	1012	293	...	
		S. to N. . . . .	...		1018.5	...	...

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. August 21. 11 h. 55 m. G.M.T.	SOUNDING No., 294.			Height above M.S.L.	Pressure.	Temperature.		REMARKS.
	Height above M.S.L.	Pressure.	Temp.			Reading.	Fall per km.	
GREATEST HEIGHT, } 17.4 km.	93 mb.	? A.	PLACE, ESKDALEMUIR.	km.	mb.	°A.	°C.	Partial eclipse of the sun. Hc 10.2 km. at 229° on one trace, and 10.6 km. at 226° on the other.
			Latitude, 55° 19' W.	17.00	97	?		
LOWEST TEMPERATURE, } 10.2 km.	263 mb.	224° A.	Longitude, 3° 12' W.	16.88	100	?		Temperatures above 15 km. vitiated by solar radiation.
			Height above M.S.L., } 242 m.	16.00	112	?		
BASE OF STRATOSPHERE, } 10.4 km.	...	225° A.	PLACE OF FALL, Longformacus, Berwick.	15.00	128	236		Very different humidities are shown on the up and down traces.
			Distance, 74 km.	14.00	159	235		
Type No. 1.	No. 1.	No. 1.	Orientation, 45° from N.	13.00	173	234	-1	The balloon went up through stratus over Eskdalemuir.
				12.05	200	231	-1	
From observations at Station				12.00	203	231	-3	Note.—The two sets of temperatures and two traces referred to give the ascending and descending readings from one and the same instrument.
PRESSURE (M.S.L.),		at 7 h. 1018.2 mb.	at 18 h. G.M.T. 1017.0 mb.	11.00	233	227, 225	-4	
TEMPERATURE,		284° A.	287° A.	10.00	270	229, 229	2 4	
VAPOUR PRESSURE, . . . . .		...	...	9.34	300	232, 228	5 2	
GRADIENT WIND :—Direction,		180±°	Indefinite.	9.00		234, 231	6 7	
Velocity,		1.7 m/s.	...	8.00	400	240, 238	6 7	
Correction for Curvature,		0 m/s.	...	7.33		245	7 9	
Final Components, { W. to E.		0 m/s.	...	7.00	419	247	7 9	
		S. to N. . . . .	...	6.00	481	254	7	
				5.70	500	257	8	
				5.00	548	262		
				4.29	600	267	6	
				4.00	623	268	6	
				3.08	700	274	6	
				3.00	717	274		
				2.00	799	281	7	
				1.99	800	281		
				1.50	849	284	6	
				1.03	900	287		
				1.00	903	287		
				.50	958	288		
				Ground M.S.L.	...	289	...	
					1017	...	...

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.—E.		S.—N.
3	St.-Cu.	215	m/s. 4.5	m/s. + 2.6	+ 3.7	Slight patch of Ci.-Cu. : much Cu.-Nb. present.
5	Ci.-Cu.	190	2.9	+ 0.5	+ 2.9	
6	St.-Cu.	212	5.0	+ 2.6	+ 4.2	Apical part of cloud measured.
7	Cu.-Nb.	275	4.3	+ 4.3	- 0.4	
10	Cu.-Nb.	225	7.1	+ 5.0	+ 5.0	Some St.-Cu. above.
11	Nb.	260	4.6	+ 4.5	+ 0.8	
12	St.-Cu.	250	4.0	+ 3.8	+ 1.4	Velocity of Ci. inappreciable.
13	Ci.	?	?	?	< + 1	
"	A.-Cu.	285 approx.	?	?	< + 1	A.-Cu. very slow; velocity unobtainable on account of [indefinite form of cloud.]
14	A.-Cu.	270	0.7	+ 0.7	0	
17	St.-Cu.	280	4.6	+ 4.5	- 0.8	Fog sheets below from E.S.E. Cu. degrading to Nb.
19	Fr.-St.	228	5.4	+ 4.0	+ 3.6	
22	Ci.	295	2.5	+ 2.3	- 1.1	
24	Nb.	220	11.0	+ 7.1	+ 8.5	
29	A.-Cu.	236	3.1	+ 2.6	+ 1.7	

SEPTEMBER 1914.—DAILY VALUES REFERRED TO GREENWICH MEAN TIME, AND UNITS BASED ON THE C.G.S. SYSTEM.

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1. SEISMOLOGICAL JOURNAL :—ESKDALEMUIR OBSERVATORY.—Lat. 55° 19' N. Long. 3° 12' W.

Table with columns for Date, Microseisms of N. Component (o h., 6 h., 12 h., 18 h.), and Remarks. Includes detailed seismic data and descriptive notes for each day from Sept 1 to 30.

2. VALENCIA OBSERVATORY (CAHIRCIVEEN), KERRY.—Lat. 51° 56' N. Long. 10° 15' W.

Heights above Mean Sea Level :—Station, H = 12.6 m. Barometer Cistern, Hb = 13.7 m.

Heights above Ground :—Thermometers, ht = 1.2 m. Rain-gauge, hr = 0.56 m. Sunshine Recorder, hs = 12.8 m. Cups of Anemometer, ha = 14 m.

Large table with columns for Day, Pressure at Station Level, Air Temperature, Humidity, Wind Direction, Cloud Amount, Rain, Sunshine, Magnetism, and Remarks. Contains daily weather data for September 1-30, 1914.

α denotes the maximum and η the minimum value in the column.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H = 5.5 m. Barometer, H_b = 10.4 m.

Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Sunshine Recorder, h_s = 13.3 m. Cups of Anemometer, h_a = 20 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation (Milliwatts per cm²), Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALEMUIR OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H = 242.0 m. Barometer, H_b = 237.3 m.

Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Sunshine Recorder, h_s = 1.5 m. Vane of Anemometer, h_a = 15 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation (Milliwatts per cm²), Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground (Daily Mean, Extremes). Includes a REMARKS column with detailed weather notes.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.), unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

HOLYHEAD. †‡

Height of Head above—Roof 8.3 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.

Table for Holyhead with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, and Time of Gust. Includes summary rows for S+N & W+E and S-N & W-E.

DEERNESS. †

Height of Cups above—Roof 1.5 m., Ground 4.9 m., M.S.L. 57.3 m.

Table for Deerness with columns for Date, 3 h., 9 h., 15 h., 21 h., Vel. in Max. Hourly Run, and Time of Max. Includes summary rows for S+N & W+E and S-N & W-E.

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.

Table for Scilly with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, and Time of Gust. Includes summary rows for S+N & W+E and S-N & W-E.

GREAT YARMOUTH. †‡

Height of Head above—Roof 10.7 m., Ground 12.8 m., M.S.L. 15.9 m. Height of Cups above—Roof 3.7 m., Ground 18.3 m., M.S.L. 22.3 m.

Table for Great Yarmouth with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust (Gorleston), and Time of Gust. Includes summary rows for S+N & W+E and S-N & W-E.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time.

† Robinson Cup Anemometer; Arms 0.305 m.; Diameter of Cups 0.127 m.; Factor 2.8.

‡ Robinson Cup Anemometer; Arms 0.61 m.; Diameter of Cups 0.229 m.; Factor 2.2.

§ Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube.

The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S. W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.
Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 135. September 2. 8 h. 5 m. G.M.T.								ABERDEEN. P. 139. September 7. 7 h. 55 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.		Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.						Direction.	Velocity.	Components.				
				W.-E.	S.-N.							W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	2886	...	...	...	...	...	Atmosphere hazy. Clouds St.-Cu., normal type. Balloon lost in St.-Cu. cloud. Final elevation 29° 45'.	4566	...	...	...	...	...	Atmosphere hazy. Clouds Ci.-Cu. Nephoscope observation immediately after ascent, direction 241°, velocity 1.5 m/s. (at 1000 m.). Assuming 5 km. as height of clouds, components would be—	
	2800	292	11.6	+ 10.7	- 4.3	...	Pressure Distribution (7 h.). Extensive irregular high-pressure system over whole of Europe. Station near point of maximum intensity. Depression S. of Greenland.	4500	225	7.5	+ 5.3	+ 5.3	...	W.-E. + 6.5 m/s. S.-N. + 3.5 m/s. Balloon lost in high haze. Final elevation 27° 0'.		
	2500	271	9.7	+ 9.7	- 0.1	...		4000	225	5.2	+ 3.7	+ 3.7	...			
	2000	264	8.3	+ 8.3	+ 0.9	...		3500	255	6.7	+ 6.5	+ 1.7	...			
	1750	252	8.8	+ 8.3	+ 2.8	...		3000	257	5.7	+ 5.5	+ 1.3	...			
	1500	241	9.1	+ 7.9	+ 4.4	...		2500	243	6.5	+ 5.8	+ 3.0	...			
	1250	231	7.0	+ 5.4	+ 4.3	...		2000	243	4.2	+ 3.7	+ 1.9	...			
	1000	202	4.5	+ 1.7	+ 4.1	...		1750	231	5.1	+ 3.9	+ 3.2	...			
	750	142	6.4	- 3.9	+ 5.0	...		1500	232	4.9	+ 3.9	+ 3.0	...			
	500	136	5.9	- 4.1	+ 4.2	...		1250	222	4.9	+ 3.3	+ 3.6	...			
100 m. above ground. Anemometer.	114	143	3.2	- 1.9	+ 2.5	...		1000	225	6.8	+ 4.8	+ 4.8	...			
	46	135	1.0	- 0.7	+ 0.7	...	750	219	6.9	+ 4.3	+ 5.4	...				
Computed for M.S.L.	(at 7 h.) (at 13 h.)	223	6.4	+ 4.4	+ 4.7	...	500	237	6.5	+ 5.4	+ 3.5	...				
			Indefinite.			...	Free lift 50 gms.	(at 7 h.)	Station in wedge of high-pressure. Indefinite gradient and direction.				Free lift 47 gms.			
ABERDEEN. P. 141. September 16. 8 h. 0 m. G.M.T.								ABERDEEN. P. 142. September 17. 7 h. 46 m. G.M.T.								
Greatest height.	3222	...	...	...	...	...	Atmosphere clear. Clouds o. Balloon lost in distance. Final elevation 17° 45'. Later some false Ci. appeared in W., too low to measure by nephoscope.	2298	...	...	...	...	...	Atmosphere hazy. Clouds: traces of St.-Cu., with St. underneath. Balloon lost in distance and high haze. Final elevation 16° 20'. The St.-Cu. showed as false Ci. at first, and increased very rapidly in quantity, becoming St.-Cu. at same time.	
	3000	275	11.3	+ 11.3	- 1.0	...	Pressure Distribution (7 h.). Belt of low-pressure with axis N.E. and S.W. from North Atlantic to Scandinavia. South-westerly type.	2217	226	9.9	+ 7.1	+ 6.9	...	Pressure Distribution (7 h.). Low-pressure system with axis N.E.-S.W. extending over British Isles and Scandinavia.		
	2500	261	11.4	+ 11.3	+ 1.7	...		2000	235	10.7	+ 8.7	+ 6.2	...			
	2000	277	8.7	+ 8.7	- 1.0	...		1750	237	10.2	+ 8.5	+ 5.5	...			
	1750	274	7.7	+ 7.7	- 0.5	...		1500	228	6.8	+ 5.0	+ 4.5	...			
	1500	290	6.3	+ 5.9	- 2.1	...		1250	209	7.3	+ 3.6	+ 6.4	...			
	1250	302	6.8	+ 5.7	- 3.6	...		1000	215	8.5	+ 4.9	+ 6.9	...			
	1000	278	7.7	+ 7.6	- 1.0	...		750	213	12.2	+ 6.7	+ 10.2	...			
	750	263	7.8	+ 7.7	+ 0.9	...		500	213	11.5	+ 6.2	+ 9.7	...			
	500	254	9.4	+ 9.0	+ 2.5	...		114	211	6.6	+ 3.3	+ 5.6	...			
100 m. above ground. Anemometer.	46	225	2.0	+ 1.4	+ 1.4	...		46	190	3.0	+ 0.5	+ 3.0	...			
Computed for M.S.L.	(at 7 h.) (at 13 h.)	248 224	11.3 10.7	+ 10.5 + 7.4	+ 4.2 + 7.7	...	Free lift 48 gms.	(at 7 h.)	207	12.3	+ 5.5	+ 11.0	...	Free lift 46 gms.		
ABERDEEN. P. 145. September 22. 7 h. 56 m. G.M.T.								ABERDEEN. P. 149. September 26. 8 h. 1 m. G.M.T.								
Greatest height.	4080	...	...	...	...	...	Atmosphere hazy. Clouds: traces of Ci. Nephoscope observation: Ci. to Ci.-Cu. at 13 h.; component velocities (at 1000 m.):— W.-E. + 0.9 m/s. S.-N. - 0.9 m/s. Balloon lost in distance. Final elevation 28° 45'. Large quantities of Ci. during day, of flux variety, showing alternately as fibrous Ci. and then as Ci.-Cu. of a fused type. Nephoscope observations show still further veering of upper currents above height reached by balloon.	3954	...	...	...	...	...	Atmosphere normal. Clouds: Upper—A.-St.; Lower—Detached masses of Cu. Balloon lost; eclipsed by passing Cu. cloud. Final elevation 10° 15'. Upper cloud sheet uniform A.-St.; some degraded Cu. below. Later on the A.-St. thinned out and showed Ci.-St. with solar halo at 12 h.	
	4000	300	2.4	+ 2.1	- 1.2	...	Pressure Distribution (7 h.). Station near centre of extensive high-pressure system.	3000	266	30.2	+ 30.2	+ 2.2	...	Pressure Distribution (7 h.). Westerly type. Extended high-pressure system with axis E.-W. over Europe and East Atlantic. Depression to N. of Iceland and Norway.		
	3500	277	4.9	+ 4.9	- 0.6	...		2500	268	16.4	+ 16.4	+ 0.5	...			
	3000	286	4.4	+ 4.2	- 1.2	...		2000	279	19.7	+ 19.4	- 3.2	...			
	2500	270	4.2	+ 4.2	0.0	...		1750	272	16.1	+ 16.1	- 0.5	...			
	2000	262	6.9	+ 6.8	+ 0.9	...		1500	266	10.2	+ 10.2	+ 0.7	...			
	1750	255	6.2	+ 6.0	+ 1.6	...		1250	271	11.6	+ 11.6	- 0.3	...			
	1500	226	5.6	+ 4.0	+ 3.9	...		1000	276	8.7	+ 8.7	- 0.9	...			
	1250	201	7.2	+ 2.6	+ 6.7	...		750	283	8.2	+ 8.0	- 1.9	...			
	1000	206	8.4	+ 3.6	+ 7.6	...		500	285	11.5	+ 11.1	- 3.0	...			
	750	211	8.5	+ 4.3	+ 7.2	...		114	276	10.5	+ 10.4	- 1.1	...			
100 m. above ground. Anemometer.	46	240	2.0	+ 1.7	+ 1.0	...	46	274	5.0	+ 5.0	- 0.3	...				
Computed for M.S.L.	(at 7 h.)	252	15.5	+ 14.7	+ 4.7	...	Free lift 47 gms.	(at 7 h.)	270	12.2	+ 12.2	0.0	...	Free lift 53 gms.		

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 74. September 6. 7 h. 23 m. G.M.T.							ESKDALEMUIR. P. 75. September 7. 7 h. 16 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.		
		Direction.	Velocity.	Components.				Direction.	Velocity.	Components.				
				W.-E.						S.-N.			W.-E.	S.-N.
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	2500	4000	351	3.9	+0.6	-3.9	Sky 7 parts clouded with Cirrus, which moved from the S. W. Final elevation 21°. Pressure Distribution (7 h.). In wedge of high pressure extending from Central Europe across the North Sea. Depression over Northern Scandinavia.		
	...	...	...	...	...	...	3500	142	5.7	-3.5	+4.5
	...	...	...	...	...	...	3000	142	3.5	-2.1	+2.7
	...	...	...	...	...	...	2500	123	4.2	-3.5	+2.3
	2000	107	3.2	-3.0	+0.9	2.4	2000	136	4.5	-3.1	+3.2			
	1750	103	2.8	-2.7	+0.6		1750	146	4.3	-2.4	+3.5			
	1500	270	0.2	+0.2	0.0		1500	172	3.5	-0.5	+3.4			
	1250	0	0.3	0.0	-0.3		1250	191	6.2	+1.2	+6.1			
	1000	64	2.5	-2.2	-1.1		1000	189	5.4	+0.8	+5.3			
	750	47	3.4	-2.5	-2.3		750	121	4.8	-4.1	+2.5			
	500	31	2.6	-1.3	-2.2		500	104	2.1	-2.0	+0.5			
	340	14	2.1	-0.5	-2.0		340	41	1.1	-0.7	-0.8			
	250	0	2.0	0.0	-2.0		250	0	0.0	0.0	0.0			
100 m. above ground. Anemometer.														
Computed for M.S.L.	(at 7 h.)	Gradient indefinite.					(at 7 h.)	157	8.8	-3.4	+8.1	...	Wt. of balloon 19.8 gms. Free lift 33 gms.	
ESKDALEMUIR. P. 79. September 29. 7 h. 25 m. G.M.T.							ESKDALEMUIR. P. 80. September 29. 12 h. 43 m. G.M.T.							
Greatest height.		
	2500	342	19.7	+6.2	-18.7	2.4	3000	330	18.3	+9.0	-15.9	2.2	Clear sky and atmosphere. Balloon blown away by strong wind. Final elevation 14°.8. Pressure Distribution (13 h.). Anticyclone over Ireland. Deep depression E. of Riga.	
	2000	341	16.2	+5.4	-15.3		2000	334	13.6	+5.4	-12.5			
	1750	331	13.1	+6.4	-11.4		1750	345	10.7	+2.8	-10.3			
	1500	343	11.0	+3.3	-10.5		1500	257	1.4	+1.3	+0.3			
	1250	341	11.8	+3.9	-11.1		1250	300	0.8	+0.7	-0.4			
	1000	356	6.4	+0.4	-6.4		1000	260	2.2	+2.2	+0.4			
	750	33	7.4	-4.0	-6.2		750	244	2.6	+2.3	+1.1			
	500	1	7.6	-0.1	-7.6		500	211	1.8	+0.9	+1.5			
	340	354	5.0	+0.5	-5.0		340	174	1.0	-0.1	+1.0			
	250	337	2.5	+1.0	-2.3		250	225	1.0	+0.7	+0.7			
100 m. above ground. Anemometer.														
Computed for M.S.L.	(at 7 h.)	0	10.9	0.0	-10.9	...	(at 13 h.)	5	7.9	-0.7	-7.9	...	Wt. of balloon 20.0 gms. Free lift 40 gms.	
ESKDALEMUIR. P. 81. September 30. 7 h. 20 m. G.M.T.							SOUTH FARNBOROUGH. P. 115. September 2. 9 h. 30 m. G.M.T.							
Greatest height.	3635		
	3500	266	5.2	+5.2	+0.4	2.4	Hazy, but cloudless. Balloon passed out of azimuth range. Pressure Distribution (7 h.). Centre of anticyclone. Depression S. E. of Greenland.	
	...	...	...	...	...	...	3000	256	3.8	+3.7	+0.9
	...	...	...	...	...	...	2500	229	2.3	+1.7	+1.5
	2000	318	8.2	+5.5	-6.1	2000	130	0.7	-0.5	+0.4				
	1750	327	8.0	+4.3	-6.7	1750	130	1.6	-1.2	+1.0				
	1500	325	9.0	+5.2	-7.3	1500	149	2.6	-1.3	+2.2				
	1250	307	8.3	+6.6	-4.9	1250	139	3.2	-2.1	+2.4				
	1000	283	11.7	+11.4	-2.7	1000	99	3.7	-3.7	+0.6				
	750	250	8.6	+8.1	+2.9	750	82	4.4	-4.4	-0.6				
	500	239	4.2	+3.6	+2.2	500	103	4.3	-4.2	+1.0				
	340	205	1.7	+0.7	+1.5	170	108	3.0	-2.8	+0.9				
	250	132	1.5	-1.1	+1.0	105	...	0.0	0.0	0.0				
100 m. above ground. Anemometer.														
Computed for M.S.L.	(at 7 h.)	267	10.1	+10.1	+0.1	...	(at 7 h.)	140	8.7	-5.6	+6.7	
							(at 13 h.)	No definite measurable gradient.				...		

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 116. September 3. 9 h. 30 m. G.M.T.							SOUTH FARNBOROUGH. P. 117. September 3. 17 h. 40 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	2355	...	...	...	...	...	9315	...	...	...	...	...	Clear at first, becoming misty. Balloon lost in distance and darkness.
	...	...	...	...	...	...	9245	302	14.5	+12.3	-7.7	...	
	...	...	...	...	...	...	9000	296	11.7	+10.5	-5.2	...	
	...	...	...	...	...	...	8500	296	10.2	+9.2	-4.4	...	<i>Pressure Distribution (18 h.).</i>
	...	...	...	...	...	...	8000	291	7.7	+7.2	-2.7	...	Deformed col region over British Isles. High over Europe generally.
	...	...	...	...	...	...	7500	280	5.1	+5.0	-0.9	...	
	...	...	...	...	...	...	7000	270	5.0	+5.0	0.0	...	
	...	...	...	...	...	...	6500	281	5.5	+5.4	-1.1	...	
	...	...	...	...	...	...	6000	304	5.4	+4.5	-3.0	...	
	...	...	...	...	...	...	5500	323	4.8	+2.9	-3.8	...	
	...	...	...	...	...	...	5000	312	3.8	+2.8	-2.5	...	
	...	...	...	...	...	...	4500	318	4.8	+3.2	-3.6	...	
	...	...	...	...	...	...	4000	299	3.6	+3.1	-1.7	...	
	...	...	...	...	...	...	3500	285	4.7	+4.5	-1.2	...	
	...	...	...	...	...	...	3000	279	3.8	+3.8	-0.6	...	
	2285	261	3.9	+3.9	+0.6	...	2500	285	3.0	+2.9	-0.8	...		
	2000	245	1.7	+1.5	+0.7	...	2000	333	1.8	+0.8	-1.6	...		
	1750	198	0.6	+0.2	+0.6	...	1750	5	3.2	-0.3	-3.2	...		
	1500	360	0.7	0.0	-0.7	...	1500	36	2.3	-1.4	-1.9	...		
	1250	354	3.8	+0.4	-3.8	...	1250	120	3.1	-2.6	+1.5	...		
	1000	21	3.4	-1.2	-3.2	...	1000	103	1.4	-1.3	+0.3	...		
	750	50	2.2	-1.7	-1.4	...	750	21	2.2	-0.8	-2.1	...		
	500	85	1.1	-1.1	-0.1	...	500	15	3.0	-0.8	-2.9	...		
100 m. above ground. Anemometer.	170	?	?	?	?	2.4	170	357	3.9	+0.2	-3.9	2.4		
	105	...	0.0	0.0	0.0	...	105	...	0.0	0.0	0.0	...		
Computed for M.S.L. (at 7 h.)	...	120	4.8	-4.2	+2.4	...	(at 18 h.)	...	<i>No definite measurable gradient.</i>				...	
Computed for M.S.L. (at 13 h.)	...	<i>No definite measurable gradient.</i>					...	...	<i>No definite measurable gradient.</i>				...

SOUTH FARNBOROUGH. P. 118. September 4. 15 h. 45 m. G.M.T.							SOUTH FARNBOROUGH. P. 119. September 8. 17 h. 15 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	5765	...	...	...	...	...	4630	...	...	...	...	...	Clear. Ci. ₆ moving from S. and changing during ascent to Ci.-Cu., and after ascent to ugly Cu.-Ni. Balloon lost in Ci.-Cu.
	5695	201	4.8	+1.7	+4.4	...	...	...	...	...	...	...
	5500	189	5.1	+0.8	+5.0	...	...	...	...	...	...	...
	5000	186	4.4	+0.5	+4.4	...	...	...	...	...	...	...
	4500	195	3.4	+0.9	+3.3	...	4500	163	9.8	-2.8	+9.4	...	<i>Pressure Distribution (18 h.).</i>	
	4000	216	4.0	+2.3	+3.2	...	4000	164	10.7	-3.0	+10.3	...	Influence of high-pressure system centred 1200 km. N. Depression over Central Russia.	
	3500	221	1.9	+1.2	+1.4	...	3500	160	10.9	-3.8	+10.2	...	Depression centred 600 km. W.S.W. High over Azores.	
	3000	174	3.0	-0.3	+3.0	...	3000	144	7.8	-4.6	+6.3	...		
	2500	190	2.3	+0.4	+2.3	...	2500	173	7.8	-0.9	+7.7	...		
	2000	127	2.0	-1.6	+1.2	...	2000	197	5.2	+1.5	+4.9	...		
	1750	115	5.5	-5.0	+2.3	2.4	1750	211	2.7	+1.4	+2.3	...		
	1500	90	5.8	-5.8	0.0	...	1500	228	3.3	+2.4	+2.2	...		
	1250	85	8.6	-8.6	-0.8	...	1250	243	0.9	+0.8	+0.4	...		
	1000	76	9.1	-8.8	-2.2	...	1000	36	0.4	-0.2	-0.3	...		
	750	64	9.5	-8.6	-4.1	...	750	192	0.5	+0.1	+0.5	...		
	500	79	7.5	-7.4	-1.4	...	500	244	1.2	+1.0	+0.5	...		
100 m. above ground. Anemometer.	170	91	5.2	-5.2	+0.1	...	170	211	3.3	+1.7	+2.8	...		
	105	95	5.0	-5.0	+0.4	...	105	...	0.0	0.0	0.0	...		
Computed for M.S.L. (at 13 h.)	...	117	11.2	-10.0	+5.1	...	(at 18 h.)	147	5.3	-2.9	+4.5	...	...
Computed for M.S.L. (at 18 h.)	...	104	16.8	-16.3	+4.1	...	...	...	<i>No definite measurable gradient.</i>				...

S. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued.*
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 121. September 18. 7 h. 5 m. G.M.T.							SOUTH FARNBOROUGH. P. 122. September 19. 7 h. 20 m. G.M.T.									
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.		Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.			
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.					
				W.-E.							S.-N.				W.-E.	S.-N.
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.				
	2925	...	...	...	...	...	3210	...	...	...	...	...	Clear.	
	2855	296	27.6	+24.8	-12.0	...	3000	343	25.2	+7.5	-24.0	...	Detached Fr.-Cu. forming and then drifting away.			
	2500	296	26.7	+24.0	-11.5	...	2500	347	21.0	+4.6	-20.5	...	Balloon lost in distance.			
	2000	290	20.8	+19.5	-7.1	...	2000	352	16.4	+2.3	-16.2	...				
	1750	296	16.4	+14.7	-7.3	...	1750	350	18.5	+3.3	-18.2	...				
	1500	307	16.0	+12.7	-9.7	...	1500	345	21.0	+5.5	-20.2	...				
	1250	312	18.3	+13.6	-12.2	...	1250	339	21.4	+7.8	-19.9	...				
	1000	316	18.9	+13.2	-13.5	2.4	1000	338	17.1	+6.3	-15.9	2.4	Deep depression centred over Southern Baltic. High from S.W. of Great Britain to Azores.			
	750	306	16.6	+13.5	-9.7	...	750	343	15.5	+4.5	-14.8	...				
	500	291	14.7	+13.7	-5.3	...	500	335	14.7	+6.2	-13.3	...				
100 m. above ground.	185	267	6.6	+6.6	+0.3	...	170	313	8.2	+6.0	-5.6	...				
Anemometer.	85	270	6.5	+6.5	0.0	...	105	315	6.5	+4.6	-4.6	...				
Computed for M.S.L.	(at 7 h.)	311	15.7	+11.9	-10.3	...	(at 7 h.)	346	14.1	+3.4	-13.7	...				
SOUTH FARNBOROUGH. P. 123. September 21. 9 h. 55 m. G.M.T.							SOUTH FARNBOROUGH. P. 124. September 22. 7 h. 0 m. G.M.T.									
Greatest height.	4485	...	...	...	...	...	3635	...	...	...	...	...	Hazy, with low fog on common. Ci.-Cu. ₃ , which dissolved during ascent.	
	4415	356	13.0	+0.9	-13.0	...	...	...	...	...	...	...	Balloon lost in making time mark when very faint.	
	4000	354	11.4	+1.1	-11.3	...	3500	9	14.3	-2.2	-14.1	...				
	3500	359	12.8	+0.1	-12.8	...	3000	3	11.0	-0.5	-11.0	...				
	3000	357	13.5	+0.7	-13.5	...	2500	4	8.9	-0.7	-8.9	...				
	2500	341	9.0	+3.0	-8.5	...	2000	1	7.8	-0.1	-7.8	...				
	2000	343	11.5	+3.4	-11.0	...	1750	10	5.7	-1.0	-5.6	...				
	1750	346	9.4	+2.2	-9.1	...	1500	352	4.9	+0.7	-4.8	...				
	1500	358	9.5	+0.3	-9.5	2.4	1250	347	5.3	+1.2	-5.2	2.4	Station at centre of high-pressure system.			
	1250	357	11.0	+0.5	-11.0	...	1000	350	4.7	+0.8	-4.6	...				
	1000	355	9.5	+0.9	-9.5	...	750	17	3.8	-1.1	-3.6	...				
	750	353	12.4	+1.6	-12.3	...	500	42	4.2	-2.8	-3.1	...				
	500	349	9.7	+1.8	-9.5	...	...	...	...	...	...	...
100 m. above ground.	170	335	8.1	+3.4	-7.3	...	170	326	2.1	+1.2	-1.8	...				
Anemometer.	105	340	5.0	+1.7	-4.7	...	105	...	0.0	0.0	0.0	...				
Computed for M.S.L.	(at 7 h.)	355	7.7	+0.7	-7.4	...	(at 7 h.)	No measurable gradient.					...			
	(at 13 h.)	347	9.4	+2.2	-9.1	...										
SOUTH FARNBOROUGH. P. 125. September 24. 10 h. 50 m. G.M.T.							SOUTH FARNBOROUGH. P. 126. September 25. 11 h. 20 m. G.M.T.									
Greatest height.	2215	...	...	...	...	...	2785	...	...	...	...	...	Clear.	
	...	...	...	...	...	...	2715	199	5.9	+1.9	+5.6	...	Ci.-St. on horizon to E.	
	2145	146	5.8	-3.2	+4.8	...	2500	203	6.7	+2.6	+6.2	...	Balloon lost when faint through vibration of instrument.			
	2000	158	5.4	-2.0	+5.0	...	2000	208	5.8	+2.7	+5.1	...				
	1750	144	5.7	-3.3	+4.6	...	1750	187	5.9	+0.7	+5.8	...				
	1500	146	7.1	-4.0	+5.9	...	1500	184	5.7	+0.4	+5.7	...				
	1250	137	9.3	-6.3	+6.8	...	1250	160	7.4	-2.5	+6.9	...				
	1000	138	8.1	-5.4	+5.9	2.4	1000	153	6.7	-3.0	+6.0	2.4	Extensive high-pressure system with axis extending eastwards from North Germany.			
	750	145	6.6	-3.8	+5.4	...	750	145	7.6	-4.3	+6.2	...	Low north of Iceland.			
	500	138	5.5	-3.7	+4.1	...	500	146	7.2	-4.1	+6.0	...				
100 m. above ground.	170	137	2.2	-1.5	+1.6	...	170	139	4.4	-3.3	+2.9	...				
Anemometer.	105	...	0.0	0.0	0.0	...	105	135	3.5	-2.5	+2.5	...				
Computed for M.S.L.	(at 7 h.)	166	9.4	-2.3	+9.1	...	(at 7 h.)	138	6.6	-4.4	+4.9	...				
	(at 13 h.)	160	11.1	-3.8	+10.3	...	(at 13 h.)	163	5.3	-1.6	+5.1	...				

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 127. September 26. 7 h. 30 m. G.M.T.								SOUTH FARNBOROUGH. P. 128. September 28. 7 h. 15 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.		
		Direc-tion.	Velo-city.	Components.					Direc-tion.	Velo-city.	Components.					
				W.-E.	S.-N.						W.-E.	S.-N.				
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.				
100 m. above ground. Anemo-meter.	2925	...	...	...	...	2.4	2500	...	...	...	...	2.4	Fairly clear. Ci. and Ci.-St. moving from W. Balloon lost owing to angular proximity to sun.	
	2855	264	8.8	+8.8	+0.9		<i>Pressure Distribution (7 h.).</i>	
	2500	264	8.3	+8.3	+0.9		...	2430	298	17.8	+15.7		-8.3	...		Deep depression centred over S.W. Sweden. Irregular high-pressure system S.W. of British Isles, axis N.W.-S.E.
	2000	247	8.0	+7.3	+3.1		...	2000	297	17.6	+15.7		-8.0	...		
	1750	256	7.1	+6.9	+1.7		...	1750	304	14.9	+12.3		-8.3	...		
	1500	268	5.8	+5.8	+0.2		...	1500	304	12.6	+10.5		-7.0	...		
	1250	267	6.2	+6.2	+0.3		...	1250	296	14.0	+12.5		-6.1	...		
	1000	276	5.3	+5.3	-0.6		...	1000	307	16.4	+13.0		-9.9	...		
	750	275	4.3	+4.3	-0.4		...	750	309	16.9	+13.1		-10.6	...		
	500	279	4.4	+4.3	-0.7		...	500	296	16.3	+14.6		-7.2	...		
100 m. above ground. Anemo-meter.	170	290	1.1	+1.1	-0.2	...	170	286	7.3	+7.0	-2.0	...				
105	...	...	0.0	0.0	0.0	...	105	270	1.0	+1.0	0.0	...		
Computed for M.S.L.	(at 7 h.)	No measurable gradient.				...	(at 7 h.)	301	11.7	+10.0	-6.0	...	...	

Note.—In addition to the ascents tabulated above, pilot balloons which were lost sight of before reaching a height of 2 km. were sent up during the month from the various stations as follows:—Aberdeen 11; Eskdalemuir 4; South Farnborough 3.

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.-E.		S.-N.
1	Cu.	228	m/s. 6.8	m/s. +5.0	m/s. +4.6	
2	Ci.	279	2.8	+2.8	-0.4	Ci. changing to Ci.-Cu. Faint ⊕ visible.
3	Cu.	305	2.7	+2.2	-1.5	Degraded Cu. Closed sheet of St.-Cu. above.
5	Cu.	197	3.3	+1.0	+3.2	
8	Fr.-St.	130	34.0	-26.0	+21.8	
9	St.-Cu.	175	3.1	-0.3	+3.1	
10	St.-Cuf.	210	16.0	+8.0	+13.8	
11	St.-Cu.	210	2.5	+1.3	+2.2	Slight squall 12 h. Cu.-Nb. below from N.W.
12	Cu.-Nb.	271	4.5	+4.5	-0.1	
15	Fr.-Cu.	266	10.0	+10.0	+0.7	
16	Cu. to St.-Cu.	256	6.0	+5.8	+1.4	Cu. changing to St.-Cu.—transition type.
17	Fr.-Nb.	190	5.0	+0.9	+4.9	Broken Nb. Cu.-Nb. in W. Direction changing rapidly.
19	Cu.-Nb.	300	5.7	+4.9	-2.9	Apical part of cloud measured.
22	Ci.	315	1.3	+0.9	-0.9	False Ci. changing to Ci.-Cu.
24	St.-Cu.	237	3.1	+2.6	+1.7	St.-Cu. inclined to lenticular form.
28	Cu.-Nb.	318	19.0	+12.7	-14.1	
29	Cu.	320	10.0	+6.4	-7.7	Cu. changing to Cu.-Nb.
30	Ci.	282	2.8	+2.7	-0.6	Observation at 13.30 h. Traces of Ci. cloud.
"	Fr.-Cu.	293	13.0	+12.0	-5.1	

11. Solar Radiation at South Kensington.

Day.	JULY.					AUGUST.					SEPTEMBER.					REMARKS.
	Max. Rate, Milli-watts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		Max. Rate, Milli-watts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		Max. Rate, Milli-watts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		
		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.	
1	80	1933	56	10.3	62	83	1248	41	2.8	18	60	x 1517	63	9.3	69	
2	77	1383	40	1.9	12	79	1241	41	4.9	32	57	1509	63	x 10.5	78	
3	58	n 416	12	0.1	1	x 86	1761	58	7.5	49	49	943	40	4.9	36	
4	n 42	979	29	12.8	78	83	1237	41	3.4	22	49	1322	57	9.5	71	
5	n 42	979	29	1.4	9	83	743	25	1.1	7	61	836	36	4.2	32	
6	70	911	27	3.5	21	80	976	33	1.6	7	63	1390	61	9.8	74	
7	x 94	1587	47	7.6	46	77	1444	49	4.7	31	47	1058	47	6.0	45	
8	71	1051	31	4.0	24	n 19	518	18	0.0	0	61	1069	48	6.0	46	
9	86	x 2246	66	10.5	64	45	613	21	0.1	0	65	1236	56	6.1	47	
10	84	2104	63	x 13.0	x 80	55	847	29	2.5	17	56	900	41	5.4	42	
11	70	1713	51	7.2	44	71	2039	70	x 13.0	x 88	51	537	25	1.9	15	
12	61	1049	31	3.7	23	72	x 2091	73	x 13.0	x 88	44	662	31	3.0	23	
13	84	1820	54	7.3	45	67	1903	67	10.8	74	58	1080	52	7.1	56	
14	84	1914	57	8.6	53	72	1921	68	10.7	73	x 71	831	40	3.8	30	
15	68	1211	37	1.5	9	28	495	18	0.0	0	61	1276	63	8.8	69	
16	87	1564	47	4.8	30	80	1780	64	11.1	76	60	1127	56	5.6	44	
17	83	1750	53	7.0	43	80	1600	58	6.3	43	60	757	38	4.5	36	
18	85	1440	44	5.7	36	72	? 1500	55	10.1	70	63	866	44	4.3	34	
19	89	1201	37	1.8	11	56	947	35	2.2	15	62	1060	55	6.3	51	
20	66	1081	33	2.0	13	48	933	35	2.2	15	60	635	33	4.2	34	
21	75	933	29	1.0	6	62	? 1480	55	7.9	55	65	1289	68	8.0	66	
22	54	831	26	4.1	26	70	1639	62	7.7	54	45	972	52	6.2	51	
23	78	1184	37	3.1	20	63	870	33	2.1	15	55	975	53	5.4	45	
24	79	1002	31	1.8	11	72	1322	51	3.8	27	50	925	51	5.3	44	
25	89	1627	51	8.2	52	63	1351	53	8.8	63	51	1230	69	8.5	71	
26	80	1296	41	3.4	22	30	n 488	9	0.0	0	54	1086	62	6.4	54	
27	85	1203	38	3.8	24	76	951	38	2.9	21	48	1180	68	9.2	77	
28	79	1254	40	1.7	11	59	1232	50	6.2	44	41	n 468	27	0.3	2	
29	44	753	24	1.4	9	62	1564	63	11.8	86	48	1153	68	9.7	x 83	
30	72	1694	54	8.5	55	56	1280	52	6.7	49	n 23	543	33	0.8	6	
31	52	1420	46	3.3	21	45	644	27	0.5	4	.	.	.	.	.
Total	...	41529	41	155	32	...	38658	45	166	37	...	30432	50	181	48	
Mean	73	R=1339		H=5.00		64	R=1247		H=5.35		55	R=1014		H=6.03		
Ratio of Mean Daily Amount to Mean Duration.				$\frac{R}{H} = 268$					$\frac{R}{H} = 233$					$\frac{R}{H} = 168$		

Note.—1 watt per cm² = 14.35 gramme-calories per cm² per minute. 1 gramme-calorie per minute = 0.7 watt nearly. 1 Joule = 0.239 gramme-calories.

If the heat were distributed throughout the atmosphere, 1000 gramme-calories per cm² would be sufficient to raise the temperature 4° C. It would take 245 gramme-calories per cm² to raise the temperature of the whole atmosphere 1° C.

N.B.—The values of Solar Radiation at South Kensington are obtained from the records of a Callendar Instrument which depends upon the difference of temperature between a black and a bright wire exposed horizontally to radiation from the whole of the sky. The values may be taken as representing the total radiation and the maximum rate of radiation per cm² received by a horizontal surface. If it is desired to compare the values published for Kew and Eskdalemuir in Tables 3 and 4 with the simultaneous value recorded by the Callendar Instrument, the former must be multiplied by the cosine of the zenith distance of the sun at the time of observation. The duration of sunshine in this table is obtained from a Campbell-Stokes Recorder.

For values January to March see p. 24.

For values April to June see p. 58.

* The "Ideal" intensity of radiation at any instant is taken to be a function of the Sun's altitude only. It is approximately the highest intensity recorded at South Kensington for the corresponding elevation of the Sun. The "Ideal" amount for the day is found by integrating the "Ideal" intensity from sun-rise to sun-set: it is the amount which could be recorded on a day when the atmosphere was in its most transparent state from sun-rise to sun-set. A memoir dealing with the subject is in preparation.

OCTOBER 1914.—DAILY VALUES REFERRED TO GREENWICH MEAN TIME, AND UNITS BASED ON THE C.G.S. SYSTEM.

[Price 1s.

Fourth Year.—No. 10. Meteorology, Solar Radiation, Seismology, Atmospheric Electricity, and Terrestrial Magnetism.

1. SEISMOLOGICAL JOURNAL:—ESKDALEMUIR OBSERVATORY.—Lat. 55° 19' N. Long. 3° 12' W.

Table with columns for Date, Microseisms of N. Component (6h, 12h, 18h), and Remarks. Contains 31 rows of data and detailed seismic observations.

2. VALENCIA OBSERVATORY (CAHIRCIVEEN), KERRY.—Lat. 51° 56' N. Long. 10° 15' W.

Heights above Mean Sea Level:—Station, H=12.6 m. Barometer Cistern, Hb=13.7 m.

Heights above Ground:—Thermometers, ht=1.2 m. Rain-gauge, hr=0.56 m. Sunshine Recorder, hs=12.8 m. Cups of Anemometer, ha=14 m.

Large table with columns for Day, Pressure, Air Temperature, Humidity, Wind, Cloud, Rain, Sunshine, Remarks, and Magnetism. Includes daily data from Oct 1 to 31 and monthly means.

x denotes the maximum and n the minimum value in the column.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level :—Station, H = 5.5 m. Barometer, H_b = 10.4 m.

Heights above Ground :—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Sunshine Recorder, h_s = 13.3 m. Cups of Anemometer, h_a = 20 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALEMUR OBSERVATORY, DUMFRIESHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level :—Station, H = 242.0 m. Barometer, H_b = 237.3 m.

Heights above Ground :—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Sunshine Recorder, h_s = 1.5 m. Vane of Anemometer, h_a = 15 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground. Includes a 'REMARKS' column and 'Normal 1911-13' row.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table for HOLYHEAD and DEERNESS. Includes columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, and Time of Gust. Sub-headers for S, N, W, E directions. Includes summary statistics for S+N+E, S-N, and W-E.

Table for SCILLY and GREAT YARMOUTH. Includes columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, and Time of Gust. Sub-headers for S, N, W, E directions. Includes summary statistics for S+N+E, S-N, and W-E.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time.
+ Robinson Cup Anemometer; Arms 0.61 m.; Diameter of Cups 0.229 m.; Factor 2.2.
§ Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.
Soundings by Kites (K.) and Pilot Balloons (P.).

BRIGHTON. K. 27. October 18. 10 h. 0 m. to 12 h. 30 m. G.M.T.

Soundings with Kites.	Height above M.S.L.	Pressure.	Temperature.		Humidity.	Density of Atmosphere.	Wind.		Cloud Observations and Remarks.	
			Reading.	Fall per km.			Direction.	Velocity.		
Greatest height.	metres. 1000	mb. 904.8	°A. 274.5	°C. 9.0	% 70	mb. 3.6	mgm/cc. 1.146	Degrees from N. 45	m/s. 11	Overcast St.-Cu. No clouds reached.
	500	962.2	279	10.9	65	4.5	1.198	45	13	
Ground level.	215 115	996.1 1008.1	282 284.7		70 75	6.0 7.7	1.226 1.229	45 45	11 9	
Computed for M.S.L.	(at 7 h.)	1022.1	49	6.8	...

BRIGHTON. K. 28. October 25. 11 h. 0 m. to 12 h. 40 m. G.M.T.

Greatest height.	1000	899.2	283	3.8	90	8.2	1.102	210	11	Overcast. St. Kite entered cloud 230 m. above ground. Wind direction by wire.
	215	987.6	286		90	10.0	1.197	220	5	
Ground level.	115	999.3	287.2		90	10.8	1.206	200	6	
Computed for M.S.L.	(at 13 h.)	1012.9	...	...	...	...	...	225	10.6	...

ABERDEEN. P. 154. October 28. 11 h. 34 m. G.M.T.

ESKDALEMUIR. P. 83. October 2. 12 h. 21 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.						Direction.	Velocity.	Components.				
				W.-E.	S.-N.							W.-E.	S.-N.			
Greatest height.	metres. 2260	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Balloon observed with two theodolites to 1060 m., when it was hidden from home station by passing patch of stratus cloud (lifted fog). Rate of ascent above 1060 m. is assumed. Distance between theodolites 830 m. Pressure Distribution (7 h.). Shallow irregular depression centred North of Scotland.	metres. 3170	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Balloon lost in Cirrus haze. Final elevation 12° 8. Pressure Distribution (7 h.). Station near centre of irregular high-pressure system. Deep depression centred North of Scandinavia.		
	...	...	...	...	...	3000		339	14.5	+ 5.2	- 13.5	...	2.0
	...	...	...	...	...	2500		326	9.9	+ 5.5	- 8.2	...	
	...	...	...	...	...	2000		313	15.4	+ 11.2	- 10.5	...	2.0
	...	...	...	...	...	1750		314	14.8	+ 10.7	- 10.2	...	
	...	...	...	...	...	1500		317	13.3	+ 9.1	- 9.6	...	2.0
	2000	263	3.9	+ 3.9	+ 0.5	2.5		1250	297	8.9	+ 8.0	- 4.0			...	
	1500	218	1.8	+ 1.1	+ 1.4	2.5		1000	233	3.6	+ 2.8	+ 2.1	...			
	1000	204	3.2	+ 1.3	+ 2.9	2.5		750	233	4.2	+ 3.3	+ 2.5	...			
	500	180	2.1	0.0	+ 2.1	2.4		500	232	3.6	+ 2.8	+ 2.2	...			
100 m. above ground. Anemometer.	114	103	2.3	- 2.2	+ 0.5	2.6	340	227	2.7	+ 1.9	+ 1.8	...				
	46	...	0.0	0.0	0.0	...	250	225	2.0	+ 1.4	+ 1.4	...				
Computed for M.S.L.	(at 7 h.) (at 13 h.)	245 197	5.9 6.7	+ 5.3 + 2.0	+ 2.5 + 6.4	Wt. of balloon 18.7 gms. Free lift 32.2 gms.		

ESKDALEMUIR. P. 84. October 15. 12 h. 39 m. G.M.T.

ESKDALEMUIR. P. 88. October 27. 7 h. 29 m. G.M.T.

Greatest height.	2400	Cloud A.-Cu. somewhat degraded. Balloon lost, cloud intervened. Final elevation 25° 8. Pressure Distribution (7 h.). Station in ridge of high-pressure lying N.E. and S.W. from Norway to the Atlantic. Depression over Iceland.	6160	Cloud Ci. at end. Amount 3/4 clouded. Direction from S.S.W. Balloon lost in distance. Final elevation 17° 3. Wind direction at ground uncertain: almost calm. Pressure Distribution (7 h.). In shallow irregular V shaped extension of depression centred S. of Iceland.
	...	...	...	...	...	...		6000	226	14.9	+ 10.7	+ 10.4	...
	...	...	...	...	...	...		5500	221	11.2	+ 7.3	+ 8.4	...
	...	...	...	...	...	...		5000	219	8.1	+ 5.1	+ 6.3	...
	...	...	...	...	...	...		4500	256	12.0	+ 11.6	+ 3.0	...
	...	...	...	...	...	...		4000	255	8.0	+ 7.7	+ 2.0	...
	...	...	...	...	...	...		3500	273	8.2	+ 8.2	- 0.4	...
	...	...	...	...	...	...		3000	273	6.9	+ 6.9	- 0.4	...
	2000	146	6.7	- 3.7	+ 5.5	2.2		2500	279	7.3	+ 7.2	- 1.1	...	
	1750	151	5.0	- 2.4	+ 4.4	...		2000	282	8.0	+ 7.8	- 1.6	...	
	1500	126	4.0	- 3.2	+ 2.3	...	1750	280	7.1	+ 7.0	- 1.3	...		
	1250	138	3.3	- 2.2	+ 2.4	...	1500	285	7.7	+ 7.4	- 2.0	...		
	1000	116	5.2	- 4.7	+ 2.3	...	1250	284	9.7	+ 9.4	- 2.4	...		
	750	100	4.1	- 4.0	+ 0.7	...	1000	284	10.0	+ 9.7	- 2.4	...		
	500	73	5.1	- 4.8	- 1.5	...	750	290	9.6	+ 9.0	- 3.3	...		
100 m. above ground. Anemometer.	340	70	7.0	- 6.6	- 2.4	...	500	294	5.9	+ 5.4	- 2.4	...		
	250	67	6.0	- 5.5	- 2.3	...	340	297	2.2	+ 2.0	- 1.0	...		
	250	67	6.0	- 5.5	- 2.3	...	250	?	0.3	?	?	...		
Computed for M.S.L.	...	No measurable gradient.					...	(at 7 h.)	280	8.2	+ 8.1	- 1.4	...	Wt. of balloon 19.4 gms. Free lift 63 gms.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 131. October 1. 11 h. 20 m. G.M.T.								SOUTH FARNBOROUGH. P. 132. October 5. 9 h. 50 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.		Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.						Direction.	Velocity.	Components.				
				W.-E.	S.-N.							W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	3495	...	...	...	...	...	Hazy. Ci. ₅ moving from N.W. Balloon lost when faint.	4200	...	...	...	...	...	Fairly clear. Overcast with Ci.-St., also Cu. forming. Balloon probably burst.	
	3425	292	8.4	+ 7.8	- 3.1	2.4	Station near region of maximum intensity of irregular high-pressure system extending over Southern Europe. Depression centred over White Sea.	4000	337	16.7	+ 6.6	- 15.3	2.4	Station near centre of anticyclone. Depression North of White Sea.		
	3000	308	8.7	+ 6.8	- 5.4			3500	356	12.1	+ 0.8	- 12.1				
	2500	327	4.3	+ 2.3	- 3.6			3000	333	11.9	+ 5.3	- 10.6				
	2000	301	4.9	+ 4.2	- 2.5			2500	342	9.0	+ 2.8	- 8.5				
	1750	298	5.1	+ 4.5	- 2.4			2000	319	8.9	+ 5.8	- 6.7				
	1500	293	7.0	+ 6.4	- 2.7			1750	322	8.6	+ 5.3	- 6.8				
	1250	301	7.4	+ 6.3	- 3.8			1500	323	7.5	+ 4.5	- 6.0				
	1000	280	5.8	+ 5.7	- 1.0			1250	321	6.8	+ 4.3	- 5.3				
	750	284	7.7	+ 7.4	- 1.9			1000	327	7.9	+ 4.3	- 6.6				
	500	269	4.4	+ 4.4	+ 0.1			750	293	6.5	+ 6.0	- 2.5				
100 m. above ground. Anemometer.	170	256	5.3	+ 5.2	+ 1.3		500	302	5.8	+ 4.9	- 3.1					
	105	250	2.0	+ 1.9	+ 0.7		170	300	2.4	+ 2.1	- 1.2					
Computed for M.S.L.	(at 7 h.)	No measurable gradient.						(at 7 h.)	Indefinite.							
	(at 13 h.)	310	11.1	+ 8.7	- 7.3			(at 13 h.)	325	8.0	+ 4.6	- 6.6				
SOUTH FARNBOROUGH. P. 134. October 7. 15 h. 20 m. G.M.T.								SOUTH FARNBOROUGH. P. 135. October 8. 7 h. 20 m. G.M.T.								
Greatest height.	4060	...	...	...	...	2.4	Fairly clear. Ci. ₅ moving from N.W. very light S.S.E. wind on surface. Balloon lost through Azimuth chain coming out.	3775	...	...	...	...	2.4	Shallow ground mist which gave place to haze. Ci. ₃ moving from W. Balloon lost in haze.	
	4000	347	4.8	+ 1.1	- 4.7			3705	270	4.1	+ 4.1	- 0				
	3500	331	3.3	+ 1.6	- 2.9			3500	272	6.4	+ 6.4	- 0.2				
	3000	311	4.4	+ 3.3	- 2.9			3000	312	5.8	+ 4.3	- 3.9				
	2500	225	1.4	+ 1.0	+ 1.0			2500	299	4.5	+ 3.9	- 2.2				
	2000	251	2.1	+ 2.0	+ 0.7			2000	293	2.3	+ 2.1	- 0.9				
	1750	156	1.0	- 0.4	+ 0.9			1750	280	3.5	+ 3.4	- 0.6				
	1500	122	1.5	- 1.3	+ 0.8			1500	283	2.6	+ 2.5	- 0.6				
	1250	114	2.8	- 2.5	+ 1.1			1250	254	2.9	+ 2.8	+ 0.8				
	1000	123	2.4	- 2.0	+ 1.3			1000	240	4.3	+ 3.7	+ 2.1				
	750	132	2.6	- 1.9	+ 1.7	750	210	3.2	+ 1.6	+ 2.8						
	500	144	2.9	- 1.7	+ 2.3	500	185	5.2	+ 0.5	+ 5.2						
100 m. above ground. Anemometer.	170	...	...	?	?		170	139	2.1	- 1.4	+ 1.6				
	105	...	0.0	0.0	0.0		105	...	0.0	0.0	0.0					
Computed for M.S.L.	...	Indefinite.						...	Indefinite.							
SOUTH FARNBOROUGH. P. 136. October 9. 10 h. 40 m. G.M.T.								SOUTH FARNBOROUGH. P. 137. October 17. 10 h. 45 m. G.M.T.								
Greatest height.	2215	...	...	...	...	2.4	Slight haze. A.-Cu. ₅ moving from N.W. Balloon lost in angular proximity to Sun.	2785	...	...	...	...	2.4	Fairly clear. Ci. A.-Cu. ₅ moving from S.E. Balloon lost when faint through oscillation.	
	2145	339	7.7	+ 2.7	- 7.2			2715	37	12.5	- 7.5	- 10.0				
	2000	329	7.1	+ 3.6	- 6.1			2500	35	13.6	- 7.8	- 11.1				
	1750	323	8.3	+ 5.0	- 6.6			2000	56	14.1	- 11.7	- 7.8				
	1500	322	8.3	+ 5.1	- 6.5			1750	56	14.7	- 12.2	- 8.2				
	1250	327	7.6	+ 4.1	- 6.4			1500	59	14.2	- 12.2	- 7.2				
	1000	334	4.5	+ 1.2	- 4.3			1250	62	12.5	- 11.0	- 5.9				
	750	351	3.9	+ 0.6	- 3.9			1000	64	12.3	- 11.1	- 5.3				
	500	8	4.0	- 0.6	- 4.0			750	60	14.7	- 12.7	- 7.3				
	170	354	1.9	+ 0.2	- 1.9			500	50	9.3	- 7.1	- 6.0				
100 m. above ground. Anemometer.	105	...	0.0	0.0	0.0		170	37	3.9	- 2.3	- 3.1					
	105	...	0.0	0.0	0.0		105	40	5.5	- 3.5	- 4.2					
Computed for M.S.L.	...	Indefinite.						(at 7 h.)	64	12.2	- 11.0	- 5.3				
								(at 13 h.)	60	11.1	- 9.6	- 5.6				

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 138. October 19. 7 h. 20 m. G.M.T.								SOUTH FARNBOROUGH. P. 139. October 21. 15 h. 30 m. G.M.T.														
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.								
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.											
				W.-E.	S.-N.						W.-E.	S.-N.										
metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.					
Greatest height.	3350	...	...	...	...	2.4	2680	...	...	...	...	2.0	2680	...	...	...	...	
	3280	58	9.4	- 8.0	- 5.0			...	...	...	...			...	...	...	...	...	...	...	...
	3000	49	11.9	- 9.0	- 7.8			...	...	...	...			...	...	...	...	...	...	...	...
	2500	56	6.0	- 5.0	- 3.4			...	2500	198	2.5			+ 0.8	+ 2.4	...	2500	198	2.5	+ 0.8	+ 2.4	...
	2000	58	6.3	- 5.3	- 3.3			...	2000	200	2.0			+ 0.7	+ 1.9	...	2000	200	2.0	+ 0.7	+ 1.9	...
	1750	40	12.1	- 7.7	- 9.3			...	1750	81	3.7			- 3.7	- 0.6	...	1750	81	3.7	- 3.7	- 0.6	...
	1500	44	13.1	- 9.1	- 9.4			...	1500	105	3.8			- 3.7	+ 1.0	...	1500	105	3.8	- 3.7	+ 1.0	...
	1250	46	11.7	- 8.5	- 8.1			...	1250	124	4.0			- 3.3	+ 2.2	...	1250	124	4.0	- 3.3	+ 2.2	...
	1000	42	11.5	- 7.7	- 8.5			...	1000	115	3.1			- 2.8	+ 1.3	...	1000	115	3.1	- 2.8	+ 1.3	...
	750	43	12.3	- 8.4	- 9.0			...	750	98	3.5			- 3.5	+ 0.5	...	750	98	3.5	- 3.5	+ 0.5	...
100 m. above ground. Anemometer.	500	42	13.3	- 8.9	- 9.9	...	500	85	2.3	- 2.3	- 0.2	...	500	85	2.3	- 2.3	- 0.2	...				
	170	17	2.8	- 0.8	- 2.7	...	170	...	...	?	?	...	170	...	...	?	?	...		
105	...	0.0	0.0	0.0	...	105	...	0.0	0.0	0.0	...	105	...	0.0	0.0	0.0	...					
Computed for M.S.L.	(at 7 h.)	53	16.3	- 13.0	- 9.8	...	...	...	<i>Shallow local depression, no measurable gradient.</i>				...	...	Wt. of balloon 4.4 gms. Free lift 16.0 gms.							
SOUTH FARNBOROUGH. P. 141. October 27. 10 h. 0 m. G.M.T.								SOUTH FARNBOROUGH. P. 142. October 28. 10 h. 55 m. G.M.T.														
Greatest height.	3350	...	...	...	...	2.4	5055	...	...	...	...	2.4	5055	...	...	...	...	
	...	...	...	...	...			...	4985	254	8.2			+ 7.8	+ 2.3	...	4985	254	8.2	+ 7.8	+ 2.3	...
	...	...	...	...	...			...	4500	249	6.6			+ 6.1	+ 2.4	...	4500	249	6.6	+ 6.1	+ 2.4	...
	...	...	...	...	...			...	4000	241	9.0			+ 7.8	+ 4.3	...	4000	241	9.0	+ 7.8	+ 4.3	...
	3280	260	21.0	+ 20.7	+ 3.8			...	3500	242	8.8			+ 7.7	+ 4.1	...	3500	242	8.8	+ 7.7	+ 4.1	...
	3000	259	20.2	+ 19.8	+ 3.9			...	3000	227	7.6			+ 5.6	+ 5.2	...	3000	227	7.6	+ 5.6	+ 5.2	...
	2500	264	17.1	+ 17.0	+ 1.7			...	2500	227	7.5			+ 5.4	+ 5.1	...	2500	227	7.5	+ 5.4	+ 5.1	...
	2000	276	16.3	+ 16.2	- 1.8			...	2000	239	7.7			+ 6.6	+ 4.0	...	2000	239	7.7	+ 6.6	+ 4.0	...
	1750	278	13.0	+ 12.9	- 1.8			...	1750	249	7.6			+ 7.1	+ 2.7	...	1750	249	7.6	+ 7.1	+ 2.7	...
	1500	278	11.8	+ 11.7	- 1.6			...	1500	262	6.5			+ 6.4	+ 0.9	...	1500	262	6.5	+ 6.4	+ 0.9	...
100 m. above ground. Anemometer.	1250	284	14.6	+ 14.2	- 3.6	...	1250	265	6.2	+ 6.2	+ 0.5	...	1250	265	6.2	+ 6.2	+ 0.5	...				
	1000	283	15.1	+ 14.7	- 3.3	...	1000	260	6.2	+ 6.1	+ 1.1	...	1000	260	6.2	+ 6.1	+ 1.1	...				
	750	289	13.5	+ 12.7	- 4.5	...	750	250	6.3	+ 5.9	+ 2.1	...	750	250	6.3	+ 5.9	+ 2.1	...				
	500	285	11.6	+ 11.2	- 3.0	...	500	251	3.1	+ 2.9	+ 1.0	...	500	251	3.1	+ 2.9	+ 1.0	...				
	170	273	6.8	+ 6.8	- 0.3	...	170	255	2.8	+ 2.7	+ 0.7	...	170	255	2.8	+ 2.7	+ 0.7	...				
	105	250	5.0	+ 4.7	+ 1.7	...	105	250	2.0	+ 1.9	+ 0.7	...	105	250	2.0	+ 1.9	+ 0.7	...				
	Computed for M.S.L.	(at 7 h.)	278	8.3	+ 8.2	- 1.2	...	(at 7 h.)	280	6.8	+ 6.7	- 1.2	...	(at 7 h.)	280	6.8	+ 6.7	- 1.2	...			
		(at 13 h.)	282	9.2	+ 9.0	- 1.9	...	(at 13 h.)	238	6.6	+ 6.0	+ 2.8	...	(at 13 h.)	238	6.6	+ 6.0	+ 2.8	...			

Note.—In addition to the ascents tabulated above, balloons which were lost sight of before reaching two kilometres were sent up from the various Stations as follows: Aberdeen, 2; Eskdalemuir, 4; South Farnborough, 3.

9. The Upper Air: Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. October 1. 7 h. 0 m. G.M.T.			SOUNDING No., 297.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.				Reading.	Fall per km.	
PLACE, BENSON.			Latitude, 51° 37'. Longitude, 1° 7'. Height above M.S.L., } 57 m.	km.	mb.	°A.	°C.	Calm and clear but hazy.
GREATEST HEIGHT, } 17.8 km.	81 mb.	220° A.		17.00	92	220		
LOWEST TEMPERATURE, } 14.0 km.	147 mb.	218° A.	16.45	100	220	-1		
BASE OF STRATOSPHERE, } 10.8 km.	243 mb.	220° A.	16.00	108	219	0		
			15.00	126	219	0		
PLACE OF FALL, Borough Green.			14.00	147	218	-1		
Type No. 2.			13.00	192	219	+1		
			12.02	200	219	0		
Distance, 104 km.			12.00	201	219	0		
Orientation, 112° from N.			11.00	235	220	1		
			10.00	273	225	5		
			9.37	300	230	8		
			9.00	317	233	8		
			8.00	367	241	8		
			7.37	400	246	7		
			7.00	422	248	8		
			6.00	484	256	8		
			5.73	500	258	8		
			5.00	552	264	8		
			4.33	600	270	8		
			4.00	627	272	8		
			3.11	700	276	4		
			3.00	710	276	4		
			2.50	756	278	4		
			2.03	800	280	4		
			2.00	804	280	4		
			1.50	855	282	3		
			1.08	900	283	3		
			1.00	908	283	3		
			.50	977	284	-5		
			.21	1000	283	-5		
From observations at Station at 7 h. at 18 h. G.M.T.			Ground M.S.L.	1018	278	...	...
PRESSURE (M.S.L.), 1026 mb. 1023 mb.			M.S.L.	1026	...	...	...
TEMPERATURE, 278° A. 288° A.								
VAPOUR PRESSURE,								
GRADIENT WIND:—Direction, Indefinite, 320°.								
Velocity,								
Correction for Curvature,								
Final Components, { W. to E. +3.8 m/s. S. to N. -4.5 m/s.								

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.-E.		S.-N.
1	Nb.-Cuf.	320	m/s. 12.0	m/s. + 8.0	m/s. - 9.0	
2	Ci.	320	5.4	+ 3.4	- 4.2	Ci. of false type in bands, radiant point N.W.
3	Cu. Cu.-Nb.	286	16.0	+15.0	- 5.0	Cu. changing to Cu.-Nb.
6	Cu. St.-Cu.	325	4.6	+ 2.6	- 3.8	Cu. changing to St.-Cu., transition type.
7	St.-Cu.	177	2.1	- 0.1	+ 2.1	Cloud varying in direction.
8	A.-Cu.	215	2.5	+ 1.5	+ 2.1	A.-Cu. incipient in places, changing to high St.-Cu.
9	St.-Cu.	298	4.5	+ 4.0	- 2.1	Observation at 12 h.
14	Cu.	0 (½)	5.4	0.0	- 5.4	Direction ½° E. of N.
19	Ci.-Cu.	275	3.0	+ 3.0	- 0.3	Ci.-Cu. to A.-Cu.
20	St.-Cu.	160	3.7	- 1.3	+ 3.5	
21	Cu.-Nb.	128	5.4	- 4.3	+ 3.3	Low type = Nb.-Cuf.
22	Cu.-Nb.	175	6.0	- 0.5	+ 6.0	Small low type of Cu.-Nb.
23	Cu.-Nb.	143	5.0	- 3.0	+ 4.0	Small low type: apical part measured.
26	St.-Cu.	216	2.2	+ 1.3	+ 1.8	Thin flat St.-Cu.
27	Ci.	167	3.1	- 0.7	+ 3.0	Ci. true type, becoming Ci.-St. in S, radiant point S.S.E. ⊕
28	Ci.	145	2.0	- 1.1	+ 1.6	Ci. 'false' type.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H=5.5 m. Barometer, H_b=10.4 m.

Heights above Ground:—Thermometers, h_t=3.0 m. Rain-gauge, h_r=0.53 m. Sunshine Recorder, h_s=13.3 m. Cups of Anemometer, h_a=20 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8=E, 16=S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Watts per cm.², Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALEMUR OBSERVATORY, DUMFRIESHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H=242.0 m. Barometer, H_b=237.3 m.

Heights above Ground:—Thermometers, h_t=0.9 m. Rain-gauge, h_r=0.38 m. Sunshine Recorder, h_s=1.5 m. Vane of Anemometer, h_a=15 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Watts per cm.², Min. Temp. on Grass, Earth Temperature at 10 h., Level of Water in the Ground, and REMARKS.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table for HOLYHEAD and DEERNESS. Includes columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, and Time of Gust. Sub-headers for wind directions (S, N, W, E) are provided for each time interval. Summary statistics for S+N, W+E, S-N, and W-E are at the bottom.

Table for SCILLY and GREAT YARMOUTH. Includes columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, and Time of Gust. Sub-headers for wind directions (S, N, W, E) are provided for each time interval. Summary statistics for S+N, W+E, S-N, and W-E are at the bottom.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. † Robinson Cup Anemometer; Arms 0.61 m.; Diameter of Cups 0.229 m.; Factor 2.2. ‡ Dines Pressure Tube Anemometer. At Great Yarmouth, Holyhead, and Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.
Soundings by Kites (K.) and Pilot Balloons (P.).

BRIGHTON. K. 29. November 1. 10 h. 0 m. to 12 h. 15 m. G.M.T.

Soundings with Kites.	Height above M.S.L.	Pressure.	Temperature.		Humidity.	Density of Atmosphere.	Wind.		Cloud Observations and Remarks.	
			Reading.	Fall per km.			Direction.	Velocity.		
Greatest height.	metres. 1000	mb. 881.6	°A. 275.5	°C. ...	% 70	mb. 5.1	mgm/cc. 1.112	Degrees from N. 180	m/s. 18	Overcast A.-Cu. Little scud about 100 m.
	500	937.3	278.8	6.6	90	8.4	1.167	155	13	
Ground level.	215 115	970.4 982.1	280.8 284.2	7.0 ...	90 80	9.5 10.6	1.199 1.199	155 140	14 11	
Computed for M.S.L.	(at 7 h.)	994.7	158	15.2	...

ABERDEEN. P. 155. November 11. 11 h. 20 m. G.M.T.

ABERDEEN. P. 156. November 13. 11 h. 20 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.				
				W.-E.	S.-N.			
Greatest height.	metres. 2836	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Balloon observed with two theodolites; base 830 m. For 2000 m. upwards vertical velocity assumed as 2.8 m/s. Wind very squally. Cloud: false Ci. Nephoscope observations immediately after ascent, assuming height 1000 m., component velocities:— W.-E. + 4.3 m/s. S.-N. + 0.2 m/s. so that a backing of the wind took place at a still higher level. Balloon lost in distance. Pressure Distribution (7 h.). Deep depressions north of Scotland and over Northern Scandinavia respectively. Belt of high pressure extends across Southern Europe into the Atlantic (westerly type of weather).	
	2750	284	21.2	+ 20.6	- 5.0	2.8		
	2500	283	21.2	+ 20.6	- 4.8			
	2000	286	22.5	+ 21.6	- 6.2			
	1500	275	27.4	+ 27.3	- 2.5	2.1		
	1000	269	25.3	+ 25.3	+ 0.3	3.2		
	500	263	20.0	+ 19.9	+ 2.4	2.5		
100 m. above ground. Anemometer.	114	251	11.6	+ 11.0	+ 3.7	2.9		
	46	245	10.0	+ 9.1	+ 4.2	...		
Computed for M.S.L.	(at 7 h.) (at 13 h.)	263 286	26.2 24.0	+ 26.0 + 23.1	+ 3.2 - 6.6		Free lift 53 gms.
Greatest height.	metres. 2780	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Balloon observed with two theodolites; base 830 m. Wind very squally. Cloud: false Ci. to Ci.-Cu. Nephoscope observations immediately afterwards, assuming height 6 km., gave component velocities:— W.-E. + 22.2 m/s. S.-N. + 3.6 m/s. so that a backing of the wind took place at the higher levels. Balloon lost in smoke to home station at 2500 m. Vertical velocity of 2.7 m/s. assumed for two highest positions. Pressure Distribution (7 h.). Low-pressure system extends from north of Scotland to White Sea. High pressure to south of England (westerly type of weather).	
	2700	294	36.5	+ 33.2	- 15.0	2.7		
	2500	294	33.1	+ 30.2	- 13.6			
	2000	292	30.5	+ 28.3	- 11.3			
	1500	295	25.5	+ 23.1	- 10.7	2.1		
	1000	293	26.4	+ 24.2	- 10.5	3.6		
	500	295	13.9	+ 12.5	- 5.9	2.1		
100 m. above ground. Anemometer.	114	...	...	...	...	...
	46	270	13.0	+ 13.0	0.0	...		
Computed for M.S.L.	(at 7 h.) (at 13 h.)	278 286	13.9 14.3	+ 13.8 + 13.7	- 1.9 - 3.9		Free lift 48 gms.

ABERDEEN. P. 157. November 18. 11 h. 20 m. G.M.T.

ABERDEEN. P. 159. November 27. 11 h. 20 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.				
				W.-E.	S.-N.			
Greatest height.	metres. 4840	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Balloon observed with two theodolites; base 830 m. Clouds: A.-St. Balloon lost in clouds. Pressure Distribution (7 h.). Station near centre of irregular high-pressure system covering Western Europe.	
	4750	304	10.5	+ 8.7	- 5.9	1.3		
	4500	318	9.4	+ 6.3	- 6.9	1.4		
	4000	299	17.9	+ 15.7	- 8.6	3.0		
	3500	292	13.5	+ 12.5	- 5.0	2.5		
	3000	288	12.7	+ 12.0	- 4.0	3.4		
	2500	288	8.0	+ 7.6	- 2.5	2.1		
	2000	278	5.4	+ 5.3	- 0.7	2.0		
	1500	276	3.0	+ 3.0	- 0.3	2.7		
	1000	266	3.9	+ 3.9	+ 0.3	2.0		
	500	253	8.0	+ 7.6	+ 2.4	2.5		
100 m. above ground. Anemometer.	114	234	6.8	+ 5.5	+ 4.0	2.7		
	46	225	3.0	+ 2.1	+ 2.1	...		
Computed for M.S.L.	...	Indefinite.	Free lift 47 gms.	
Greatest height.	metres. 2800	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	m/s. ...	Balloon observed with two theodolites; base 830 m. up to 2000 m., when balloon lost to home station. Vertical velocity of 2.7 m/s. assumed above this. Balloon lost in haze under sheet of Ci.-Cu. Nephoscope observations on Ci.-Cu. immediately after, assuming height 1000 m., component velocities:— W.-E. + 2.7 m/s. S.-N. + 2.1 m/s. or assuming height 6 km.— W.-E. + 16.2 m/s. S.-N. + 12.6 m/s. showing a backing of upper-air currents. Pressure Distribution (7 h.). Very deep depression to east of Iceland. High pressure over Southern Europe generally.	
	...	...	...	...	...	2.7
	2750	254	14.6	+ 14.0	+ 3.9			
	2500	250	12.4	+ 11.6	+ 4.3			
	2000	251	18.9	+ 17.9	+ 6.1	1.5		
	1800	251	16.9	+ 15.9	+ 5.6			
	1500	257	22.9	+ 22.3	+ 5.3			
	1000	260	16.8	+ 16.5	+ 3.0	3.1		
	500	239	15.3	+ 13.1	+ 7.8	3.1		
100 m. above ground. Anemometer.	114	219	11.8	+ 7.4	+ 9.2	2.1		
	46	240	7.0	+ 3.5	+ 6.0	...		
Computed for M.S.L.	(at 7 h.) (at 13 h.)	252 251	19.6 20.7	+ 18.6 + 19.6	+ 6.1 + 6.7	Free lift 56 gms.	

Note attached to P. 157:—At 7 h. a layer of St.-Cu. of normal type was moving from about W.S.W. At 9 h. the rear edge of this sheet was disappearing in the E., while western sky was becoming covered by long radiating bands of A.-Cu. with radiant point in N.W., whence they were moving fairly rapidly. The A.-Cu. gradually fused into a uniform A.-St. sheet, which balloon entered. Air currents shown by balloon at 5 km. level therefore agreed with observed cloud direction. At 15 h., however, A.-St. sheet opened up again and showed as A.-Cu. moving from about N.W. as previously. Above this again a still higher layer of Ci. to Ci.-Cu., radiating in long bands from N.E. moving moderately fast from N.N.E., was seen. There was thus shown an extreme case of veering in air currents, for while surface current was S.W., that at Ci.-Cu. level was in opposite direction.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.
Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 96. November 20. 12 h. 39 m. G.M.T.							BENSON. November 4. 13 h. 4 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.			
				W.-E.	S.-N.						W.-E.	S.-N.		
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
	?	...	...	...	...	...	...	...	...	...	...	...	Sky nearly clear. Balloon lost in clouds.
	3445	119	12.7	-11.1	+6.2	...	...	...	...	...	...	...
	3000	122	6.8	-5.8	+3.6	...	...	...	...	...	...	...
	2500	88	7.2	-7.2	-0.2	...	...	...	...	...	...	...
	2000	103	4.8	-4.7	+1.1	...	...	...	...	...	...	...
	1750	42	6.8	-4.5	-5.0	...	...	...	...	...	...	...
	1500	43	6.8	-4.6	-4.9	...	...	...	...	...	...	...
	1250	36	5.7	-3.3	-4.6	2.5	...	...	...	...	...	...
	1000	28	4.3	-2.0	-3.8	...	...	...	...	...	...	...
	750	16	3.4	-0.9	-3.2	...	...	...	...	...	...	...
	500	17	1.7	-0.5	-1.6	...	...	...	...	...	...	...
100 m. above ground. Anemometer.	340	22	0.5	-0.2	-0.5	...	...	...	...	...	...	...
	250	153	0.2	-0.1	+0.2	...	...	...	...	...	...	...
Computed for M.S.L.	...	Indefinite.				...	Wt. of balloon 19.0 gms. Free lift 65 gms.	(at 13 h.)	115	8.7	-7.9	+3.7
BENSON. November 25. 12 h. 55 m. G.M.T.							SOUTH FARNBOROUGH. P. 144. November 6. 9 h. 0 m. G.M.T.							
Greatest height.	2300	...	...	...	...	...	2925	...	...	...	...	...	Hazy, also considerable factory smoke.
	...	...	...	...	...	...	2855	195	11.2	+2.8	+10.8	...	Ci. ₆ changing to Ci.-Cu. Some Cu. on W. horizon moving from S.S.W. Balloon lost in haze.
	...	...	...	...	...	...	2500	201	12.0	+4.3	+11.2	...	
	...	...	...	...	...	...	2000	198	11.6	+3.6	+11.0	...	
	...	...	...	...	...	...	1750	203	10.8	+4.2	+9.9	...	
	...	...	...	...	...	...	1500	204	10.8	+4.4	+9.9	...	
	2000	308	11	+9	-7	?	1250	206	11.2	+4.9	+10.0	2.4	Station in col between high-pressure systems over Central Russia and to S.W. of the Azores, and shallow depression over Mediterranean and to N.W. of Great Britain respectively.	
	1500	293	8	+7	-3	...	1000	207	11.1	+5.8	+9.5	...		
	1000	297	7	+6	-3	...	750	214	10.6	+5.9	+8.8	...		
	500	270	5	+5	0	...	500	203	8.8	+3.4	+8.1	...		
100 m. above ground. Anemometer.	...	...	...	...	...	...	170	185	5.8	+0.5	+5.8	...	
	...	...	...	...	...	...	105	160	2.0	-0.7	+1.9	...	
Computed for M.S.L.	(at 7 h.) 302 (at 18 h.) 238	13.1 8.3	+11.1 +7.0	-6.9 +4.4	...	...	(at 7 h.) 180 (at 13 h.) Indefinite	6.1 Indefinite	0.0 ...	+6.1 ...	...	...	...
SOUTH FARNBOROUGH. P. 145. November 6. 15 h. 25 m. G.M.T.							SOUTH FARNBOROUGH. P. 146. November 7. 7 h. 20 m. G.M.T.							
Greatest height.	3035	...	...	...	...	...	4200	...	...	...	...	...	Hazy.
	...	...	...	...	...	...	4135	299	12.0	+10.5	-5.8	...	A shallow mist layer was on the common, the sky above being cloudless.
	...	...	...	...	...	...	4000	300	11.4	+9.8	-5.7	...	The balloon was lost through smoke.
	2965	222	14.3	+9.5	+10.7	...	3500	311	7.9	+6.0	-5.2	...		
	2500	224	8.6	+6.0	+6.2	...	3000	311	6.8	+5.1	-4.5	...		
	2000	239	11.2	+9.6	+5.8	...	2500	315	6.4	+4.5	-4.5	...		
	1750	237	11.3	+9.5	+6.1	...	2000	320	5.1	+3.3	-3.9	...		
	1500	234	8.8	+7.1	+5.2	2.0	1750	317	5.4	+3.7	-3.9	2.4	Station in irregular col region between shallow depressions in N.E. Atlantic and Mediterranean and high-pressure system over the Azores and Western Russia respectively.	
	1250	228	7.8	+5.8	+5.2	...	1500	315	4.4	+3.1	-3.1	...		
	1000	225	6.4	+4.5	+4.5	...	1250	314	4.3	+3.1	-3.0	...		
	750	226	7.1	+5.1	+4.9	...	1000	326	4.5	+2.5	-3.7	...		
	500	242	6.3	+5.5	+2.9	...	750	326	3.3	+1.8	-2.7	...		
100 m. above ground. Anemometer.	170	267	4.2	+4.2	+0.2	...	500	299	4.4	+3.8	-2.1	...		
	105	250	2.0	+1.9	+0.7	...	170	288	3.9	+3.7	-1.2	...		
	105	...	0.0	0.0	0.0	...	105	...	0.0	0.0	0.0	...		
Computed for M.S.L.	...	Indefinite.				...	...	Indefinite.				...	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 147. November 10. 7 h. 15 m. G.M.T.							SOUTH FARNBOROUGH. P. 148. November 12. 7 h. 20 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
100 m. above ground. Anemometer.	3495	...	...	...	...	2.4	2075	...	...	...	...	2.4	Clear, visibility. Ci ₃ moving from W.N.W. Balloon lost through distance and angular proximity to Sun. Pressure Distribution (7 h.). Anticyclone centred between Azores and Cornwall. Depression centred over Baltic (weather north-westerly type).		
	3425	281	20.6	+20.2	-3.8		...	...	...	...	...			...
	3000	274	19.7	+19.7	-1.4		...	...	...	...	...			...
	2500	272	15.4	+15.4	-0.4		...	...	...	...	...			...
	2000	288	12.4	+11.7	-3.9		...	2000	311	26.0	+19.7			-17.0	...
	1750	301	10.8	+9.3	-5.5		...	1750	308	23.9	+18.8			-14.7	...
	1500	306	11.3	+9.2	-6.6		...	1500	307	20.7	+16.5			-12.4	...
	1250	302	11.3	+9.6	-5.9		...	1250	307	22.9	+18.3			-13.7	...
	1000	285	15.3	+14.7	-4.0		...	1000	304	24.6	+20.2			-13.9	...
	750	279	16.1	+15.9	-2.4		...	750	297	21.5	+19.1			-9.8	...
500	267	14.0	+14.0	+0.8	...	500	287	19.9	+19.0	-5.8	...				
100 m. above ground. Anemometer.	170	246	7.4	+6.8	+3.0	...	170	265	9.7	+9.7	+0.8	...			
	105	225	5.5	+3.9	+3.9	...	105	260	10.5	+10.3	+1.8	...			
Computed for M.S.L.	(at 7 h.)	260	11.4	+11.2	+2.0	...	(at 7 h.)	308	21.9	+17.3	-13.5	...	...
	(at 13 h.)	280	7.1	+6.9	+1.2	...						...	...
SOUTH FARNBOROUGH. P. 150. November 16. 14 h. 10 m. G.M.T.							SOUTH FARNBOROUGH. P. 151. November 17. 9 h. 55 m. G.M.T.								
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
100 m. above ground. Anemometer.	2640	...	...	...	...	2.4	2215	...	...	...	...	2.4	Hazy, but cloudless. Balloon lost in haze. Pressure Distribution (7 h.). Anticyclone of considerable extension in an S.-N. direction lies over British Isles.		
	2500	20	20.2	-6.9	-19.0		...	2145	8	11.4	-1.5			-11.3	...
	2000	18	16.6	-5.0	-15.8		...	2000	13	11.4	-2.5			-11.1	...
	1750	19	19.8	-6.6	-18.7		...	1750	9	12.0	-1.9			-11.8	...
	1500	24	16.6	-6.8	-15.1		...	1500	20	13.2	-4.5			-12.4	...
	1250	24	17.8	-7.1	-16.3		...	1250	27	15.2	-6.9			-13.6	...
	1000	21	17.9	-6.5	-16.7		...	1000	25	13.4	-5.6			-12.2	...
	750	16	19.6	-5.5	-18.8		...	750	18	10.1	-3.1			-9.6	...
	500	6	16.6	-1.6	-16.5		...	500	21	11.2	-4.0			-10.5	...
	100 m. above ground. Anemometer.	170	354	8.4	+0.8		-8.4	...	170	337	3.7			+1.4	-3.4
	105	360	7.0	0.0	-7.0	...	105	...	0.0	0.0	0.0	...			
Computed for M.S.L.	(at 13 h.)	10	12.4	-2.2	-12.2	...	(at 7 h.)	68	12.8	-11.9	-4.4	...	...
	(at 18 h.)	37	16.6	-10.0	-13.3	...	(at 13 h.)	45	6.0	-4.2	-4.2	...	...
							
SOUTH FARNBOROUGH. P. 152. November 18. 9 h. 20 m. G.M.T.							SOUTH FARNBOROUGH. P. 155. November 20. 15 h. 15 m. G.M.T.								
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
100 m. above ground. Anemometer.	2215	...	...	...	...	2.4	3920	...	...	...	...	2.4	Hazy, but cloudless. Balloon lost in distant haze. Pressure Distribution (18 h.). Irregular high-pressure system, with maximum intensity over North Sea, lies over Western Europe.		
	...	...	...	...	...		...	3850	71	21.9	-20.7			-7.2	...
	...	...	...	...	...		...	3500	69	19.0	-17.7			-6.9	...
	...	...	...	...	...		...	3000	68	18.0	-16.7			-6.8	...
	2145	46	9.4	-6.7	-6.5		...	2500	70	16.5	-15.5			-5.5	...
	2000	56	7.8	-6.4	-4.3		...	2000	85	12.8	-12.7			-1.1	...
	1750	65	8.6	-7.8	-3.6		...	1750	95	10.5	-10.5			+1.0	...
	1500	74	7.8	-7.5	-2.1		...	1500	102	10.4	-10.2			+2.2	...
	1250	84	8.1	-8.1	-0.9		...	1250	90	12.7	-12.7			+0.1	...
	1000	91	7.3	-7.3	+0.1		...	1000	82	11.1	-11.0			-1.5	...
750	95	5.8	-5.8	+0.5	...	750	82	8.1	-8.0	-1.1	...				
500	104	6.1	-5.9	+1.5	...	500	87	6.7	-6.7	-0.3	...				
100 m. above ground. Anemometer.	170	69	4.9	-4.5	-1.7	...	170	84	5.6	-5.6	-0.6	...			
	105	...	0.0	0.0	0.0	...	105	70	3.5	-3.3	-1.2	...			
Computed for M.S.L.	(at 7 h.)	64	8.9	-8.0	-3.9	...	(at 13 h.)	118	10.7	-9.4	+5.0	...	...
	(at 13 h.)	Indefinite, station near centre of anticyclone.				...	(at 18 h.)	83	11.4	-11.3	-1.4	...	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 157. November 24. 9 h. 20 m. G.M.T.							SOUTH FARNBOROUGH. P. 158. November 25. 7 h. 5 m. G.M.T.							
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.			Vertical Velocity of Balloon.	Cloud Observations and Remarks.		
		Direc-tion.	Velo-city.	Com-pon-ents.				Direc-tion.	Velo-city.	Com-pon-ents.				
				W.-E.						S.-N.			W.-E.	S.-N.
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
100 m. above ground.	5340	2.4	5955	2.4		
	5270	356	10.2	+0.7	-10.2		4985	327	31.1	+17.0	-26.0			
	5000	360	7.9	0.0	-7.9		4500	324	22.4	+13.2	-18.1			
	4500	8	12.1	-1.6	-12.0		4000	320	17.3	+11.1	-13.4			
	4000	6	16.1	-1.6	-16.0		3500	316	19.1	+13.3	-13.7			
	3500	4	12.9	-1.0	-12.9		3000	307	14.4	+8.6	-11.5			
	3000	348	8.9	+1.9	-8.7		2500	323	16.7	+10.0	-13.3			
	2500	7	10.4	-1.2	-10.3		2000	328	13.8	+7.3	-11.7			
	2000	355	7.1	+0.6	-7.1		1750	327	15.4	+8.3	-12.9			
	1750	349	3.2	+0.6	-3.1		1500	328	14.5	+7.6	-12.3			
	1500	330	3.8	+1.9	-3.3		1250	325	13.0	+7.5	-10.6			
	1250	323	4.4	+2.6	-3.5		1000	332	13.6	+6.4	-12.0			
	1000	333	4.7	+2.1	-4.2		750	336	13.4	+5.5	-12.2			
	750	331	4.5	+2.1	-3.9		500	334	14.5	+6.4	-13.0			
500	329	3.3	+1.7	-2.8	170	313	7.4	+5.4	-5.0					
Anemo-meter.	105	...	0.0	0.0	0.0	105	290	1.5	+1.4	-0.5				
Computed for M.S.L.	(at 7 h.)	312	9.9	+7.3	-6.6	...	(at 7 h.)	302	13.1	+11.1	-6.9	...		
	(at 13 h.)	300	8.4	+7.2	-4.2	...		(at 18 h.)	238	8.3	+7.0	+4.4	...	
SOUTH FARNBOROUGH. P. 159. November 25. 14 h. 45 m. G.M.T.							SOUTH FARNBOROUGH. P. 160. November 27. 9 h. 15 m. G.M.T.							
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		
100 m. above ground.	3635	2.4	2925	2.4		
	3500	307	16.7	+13.3	-10.1		2855	255	22.2	+21.5	+5.6			
	3000	306	12.9	+10.4	-7.6		2500	250	16.0	+15.0	+5.6			
	2500	294	15.1	+13.8	-6.1		2000	257	14.2	+13.8	+3.1			
	2000	302	7.8	+6.6	-4.2		1750	254	16.3	+15.6	+4.5			
	1750	289	6.7	+6.3	-2.2		1500	253	19.2	+18.4	+5.5			
	1500	285	5.3	+5.1	-1.4		1250	251	22.2	+21.0	+7.2			
	1250	307	4.4	+3.5	-2.6		1000	250	21.6	+20.3	+7.4			
	1000	285	3.7	+3.6	-1.0		750	249	17.9	+16.7	+6.3			
	750	259	5.1	+5.0	+1.0		500	247	14.1	+12.9	+5.6			
	500	260	6.3	+6.2	+1.1		170	227	9.6	+7.0	+6.5			
	170	226	4.6	+3.3	+3.2		105	200	4.0	+1.4	+3.8			
	Anemo-meter.	105	220	0.5	+0.3		+0.4	105	200	4.0	+1.4		+3.8	
	Computed for M.S.L.	(at 7 h.)	(at 7 h.)	262	13.8		+13.7	+1.9
	(at 18 h.)	238	8.3	+7.0	+4.4	...		(at 13 h.)	258	14.1	+13.8	+2.8	...	

Note.—In addition to the ascents recorded above, pilot balloons which were lost sight of before reaching a height of 2 kilometers were sent up during the month at the various stations as follows: Aberdeen 1; Eskdalemuir 1; Benson 1.

9. The Upper Air : Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. November 6. 15 h. 37 m. G.M.T.				SOUNDING No., 299. PLACE, BENSON.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.	Reading.				Fall per Km.		
GREATEST HEIGHT, } 12.6 km.	167 mb.	219° A.	Latitude, 51° 37'	km.	mb.	°A.	°C.	Overcast. Isothermal at 270° from 2.2 to 2.5 km.	
LOWEST TEMPERATURE, } 12.6 km.	167 mb.	219° A.	Longitude, 1° 7' W.	12.00	186	220	1		
BASE OF STRATOSPHERE, } 8.3 km.	330 mb.	220° A.	Height above M.S.L., } 57 m.	11.43	200	220			
				11.00	214	221	- 1		
Type	No. 1.		PLACE OF FALL, Barkby (Leicestershire).	10.00	250	220	0		
				9.00	292	220	2		
			Distance, and Orientation, 2° from N.	8.81	300	221			
				8.00	341	222	9		
				7.00	397	231	9		
				6.91	400	231	9		
				6.00	459	240	9		
				5.39	500	246	9		
				5.00	537	249	9		
				4.02	600	258	2		
				4.00	603	258	2		
				3.00	687	260	11		
				2.86	700	267	6		
				2.50	732	270			
				2.00	780	271			
				1.81	800	272	6		
				1.50	832	273			
				1.00	887	277			
				.87	900	277			
				.50	943	282			
				.002	1000	284			
				Ground	995	285	...		
				M.S.L.	1002		

From Chart		at 7 h.	at 18 h. G.M.T.
PRESSURE (M.S.L.),		1009 mb.	...
TEMPERATURE,		283° A.	...
VAPOUR PRESSURE,		...	...
GRADIENT WIND:—Direction,		180°	<i>Indefinite</i>
Velocity,		6.1 m/s.	...
Correction for Curvature,		0.0 m/s.	...
Final Components, { W. to E.		0.0 m/s.	...
{ S. to N.		+ 6.1 m/s.	...

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity.	Components.		
				V.	W.-E.		S.-N.
2	St.-Cu.	155	m/s. 5.0	m/s. - 2.1	m/s. + 4.5	Some Fr.-Nb. below, also from SSE.
7	Ci.	271	1.4	+ 1.4	0.0	Ci. to Ci.-Cu., nuclear thread type.
„	St.-Cu.	263	1.9	+ 1.9	+ 0.2	
10	Ci.-Cu.	267	4.0	+ 4.0	+ 0.2	Ci.-Cu. developed from false Ci., became lenticular later.
11	Ci.	267	4.3	+ 4.3	+ 0.2	Ci. of false type. Cu.-Nb. on horizon.
12	Cu.-Nb.	315	31.0	+22.0	-22.0	
13	Ci.	261	3.7	+ 3.7	+ 0.6	False Ci. inclining to Ci.-Cu.
14	Cu.-Nb.	315	19.0	+13.5	-13.5	
17	St.-Cu.	45	3	- 2.3	- 2.3	Fine high type St.-Cu.
23	St.-Cu.	330	1.8	+ 0.9	- 1.6	Thin flat type of St.-Cu.
27	Ci.-Cu.	233	3.5	+ 2.8	+ 2.1	Thin indefinite Ci.-Cu.
30	St.-Cu.	215	15.0	+ 8.6	+12.3	Diffuse St.-Cu., low type, in well-defined rolls.

3. KEW OBSERVATORY, SURREY.—Lat. 51° 28' N. Long. 0° 19' W.

Heights above Mean Sea Level:—Station, H = 5.5 m. Barometer, H_b = 10.4 m.

Heights above Ground:—Thermometers, h_t = 3.0 m. Rain-gauge, h_r = 0.53 m. Sunshine Recorder, h_s = 13.3 m. Cups of Anemometer, h_a = 20 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity (Vapour Pressure, Percentage), Wind Direction in Points (8 = E, 16 = S) and Velocity (metres per second), Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Watts per cm.², Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground (Daily Mean, Extremes).

4. ESKDALEMUIR OBSERVATORY, DUMFRIESSHIRE.—Lat. 55° 19' N. Long. 3° 12' W.

Heights above Mean Sea Level:—Station, H = 242.0 m. Barometer, H_b = 237.3 m.

Heights above Ground:—Thermometers, h_t = 0.9 m. Rain-gauge, h_r = 0.38 m. Sunshine Recorder, h_s = 1.5 m. Vane of Anemometer, h_a = 15 m.

Table with columns for Day, Pressure at Station Level, Air Temperature in Degrees Absolute, Humidity, Wind Direction and Velocity, Cloud Amount and Weather, Rain 24 hours beginning 9 h., Sunshine, Solar Radiation, Watts per cm.², Min. Temp. on Grass, Earth Temperature at 10 h., and Level of Water in the Ground. Includes a 'REMARKS' column with detailed weather notes and a 'Normal 1911-13' row.

The solar radiation is the mean of the readings within the nominal hour of observation (11 h. 30 m.—12 h. 30 m.) unless some other hour is specified. Temperatures at or below the normal freezing point of water are printed in small type.

7. Tables of Wind Components in metres per second at fixed hours, together with the mean velocity (horizontal movement) in metres per second for the hour with the maximum hourly run for each day, or the greatest velocity attained in a gust and the time of its occurrence.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and Date, 3 h., 9 h., 15 h., 21 h., Vel. in Max. Hourly Run, Time of Max. for HOLYHEAD and DEERNESS.

Table with columns for Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust, Time of Gust, and Date, 3 h., 9 h., 15 h., 21 h., Max. in a Gust (Gorleston), Time of Gust for SCILLY and GREAT YARMOUTH.

The velocities at fixed hours are means for the interval from 30 minutes before to 30 minutes after the hour. The hours are numbered 1 h. to 24 h. Time is referred to Greenwich Mean Time. Scilly the readings at fixed hours are taken from the Robinson Anemometer; the maxima quoted are the greatest winds in a gust as recorded by the Dines Pressure Tube. The direction given is that from which the air is moving. Thus an entry of 10 under S. and 10 under W. indicates a wind of 14 m/s from S.W.

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level.
Soundings by Kites (K.) and Pilot Balloons (P.).

ABERDEEN. P. 160. December 9. 11 h. 20 m. G.M.T.								ABERDEEN. P. 161. December 16. 11 h. 20 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.						Direction.	Velocity.	Components.				
				W.-E.	S.-N.							W.-E.	S.-N.			
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.		metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.			
	2600	Two theodolites used; base 940 m. Balloon was lost to home station at 1600 m. and to out-station at 2600 m. behind Nb.-Cuf. clouds. Clouds were of loose cumuliform type, with detached fragments surrounding main masses. Later they fused into a uniform sheet, and rain fell. Their altitude was probably low, as their direction soon after 12 h. was from the north.	2620	Clouds St.-Cu. normal type; rather fine cloudlets. Nephoscope observations immediately after ascent gave, assuming height 1 km., components—	
	2500	272	10.1	+ 10.1	- 0.4	3.1	Assumed 3.1	2500	290	11.1	+ 10.4	- 3.8	2.7	W.-E. + 2.8 m/s. S.-N. + 1.1 m/s., or assuming height 3 km.—		
	2000	286	11.0	+ 10.5	- 3.1	3.1		2000	289	7.4	+ 7.0	- 2.4	W.-E. + 8.4 m/s. S.-N. + 3.3 m/s., indicating a continued backing of upper air currents. Balloon lost; burst.			
	1500	303	6.4	+ 5.4	- 3.5	3.1		1500	323	15.9	+ 9.6	- 12.7	Pressure Distribution (7 h.).			
	1000	316	5.4	+ 3.7	- 3.9	3.1		1000	316	19.0	+ 13.2	- 13.6	A shallow low-pressure system extends from Iceland to the Black Sea, and an anticyclone of weak intensity is centred near the Azores.			
	500	299	8.2	+ 7.2	- 4.0	3.4		500	313	19.1	+ 13.9	- 13.0				
100 m. above ground.	114	286	5.0	+ 4.8	- 1.4	2.1	Station in shallow elongated depression, extending from Mid Atlantic and the Bay of Biscay across Scandinavia to Arctic regions.	114	302	10.4	+ 8.8	- 5.6				
Anemometer.	46	315	2.0	+ 1.4	- 1.4	...		46	295	7.0	+ 6.3	- 2.9				
Computed for M.S.L.	(at 7 h.) (at 13 h.)		Indefinite.				Free lift 44 gms.	(at 7 h.) (at 13 h.)	341 302	11.9 12.3	+ 3.9 + 10.4	- 11.3 - 6.6	...	Free lift 41 gms. ...		
ABERDEEN. P. 162. December 18. 11 h. 20 m. G.M.T.								ESKDALEMUIR. P. 97. December 10. 12 h. 31 m. G.M.T.								
Greatest height.	2320	Two theodolites used; base 930 m. Balloon lost to out-station after 2000 m.; lost to home station in haze at 2320 m. Clouds: after 12 h. some Ci.-Cu. became visible. Measured by nephoscope, assuming 1 km. as height, components were—	6220	Clouds Ci.-Ci. nebula. Amount: 7. Motion from south. A brilliant solar halo with mock Sun had been visible all morning. Barometer rising moderately. Final elevation 29° 3. Balloon lost in distance.		
	2250	260	12.1	+ 11.9	+ 2.2	2.8	W.-E. + 2.5 m/s. S.-N. + 2.2 m/s., or assuming 6 km.—	6000	178	8.3	- 0.3	+ 8.3	2.2	A complex elongated low-pressure system extends from a deep depression in the Atlantic S.W. of Ireland across Southern England and Denmark to Arctic regions. The station is in a col determined by a local high-pressure centre north-east of the Shetland Islands.		
	2000	256	10.3	+ 10.0	+ 2.4	3.1	W.-E. + 15.0 m/s. S.-N. + 13.2 m/s. A further backing of the upper current is shown. Observations of St.-Cu. during day show, however, a veering. At 7 h. direction was between S.S.W. and S.W.; at 13 h. due W., and moving fast; at 15 h. still W.	5500	175	5.9	- 0.5	+ 5.9	2.2			
	1500	280	13.8	+ 13.6	- 2.3	2.4	Pressure Distribution (7 h.).	5000	193	6.8	+ 1.5	+ 6.7	2.2			
	1000	260	13.3	+ 13.1	+ 2.2	1.6	A rather steep north-westerly gradient exists from high pressures over South and Central Europe to a depression of moderate depth centred near Iceland.	4500	221	3.4	+ 2.3	+ 2.6	2.2			
	500	247	9.5	+ 8.8	+ 3.7	2.2		4000	209	4.4	+ 2.1	+ 3.8	2.2			
100 m. above ground.	114	225	5.4	+ 3.8	+ 3.8	2.8		3500	193	4.0	+ 0.9	+ 3.9	2.2			
Anemometer.	46	...	0.0	0.0	0.0	...		3000	177	4.5	- 0.2	+ 4.5	2.2			
Computed for M.S.L.	(at 7 h.) (at 13 h.)	220 233	13.9 12.9	+ 8.9 + 10.3	+ 10.6 + 7.8	...	Free lift 55 gms.	(at 13 h.)	Indefinite.			...	Free lift 39 gms.			
ESKDALEMUIR. P. 98. December 16. 12 h. 37 m. G.M.T.								ESKDALEMUIR. P. 99. December 22. 12 h. 42 m. G.M.T.								
Greatest height.	3600	Clouds Ci. and Ci.-Str. Amount: 7. Motion from N.W. A little lenticular Ci. was also visible. Balloon lost in distance. Final elevation 11° 4.	4100		Clouds St.-Cu. Amount: 1. Motion from N.E. Final elevation 20° 7. Balloon lost in distance.	
	3500	297	10.1	+ 9.0	- 4.6	2.3	Pressure Distribution (18 h.). The station is near the margin of transition from an anticyclone of great extent in an easterly and westerly direction, situated to the south, to a parallel shallow low-pressure system to the north.	4000	81	7.4	- 7.3	- 1.1	2.2	An elongated low-pressure system extends from Greenland almost to the Bay of Biscay. The station is in an irregular pressure distribution, marking the transition from the above to a well-defined anticyclone over Russia.		
	3000	272	7.3	+ 7.3	- 0.2	2.3		3500	69	7.2	- 6.7	- 2.6	2.2			
	2500	307	21.0	+ 16.7	- 12.7	2.3		3000	81	6.7	- 6.6	- 1.0	2.2			
	2000	306	13.0	+ 10.5	- 7.7	2.3		2500	67	6.5	- 6.0	- 2.6	2.2			
	1750	306	11.7	+ 9.5	- 6.9	2.3		2000	94	2.8	- 2.8	+ 0.2	2.2			
	1500	306	10.4	+ 8.5	- 6.1	2.3		1750	96	5.0	- 5.0	+ 0.5	2.2			
	1250	311	13.0	+ 9.8	- 8.6	2.3		1500	102	6.6	- 6.4	+ 1.3	2.2			
	1000	313	15.8	+ 11.6	- 10.7	2.3		1250	107	5.1	- 4.9	+ 1.5	2.2			
	750	317	10.0	+ 6.9	- 7.3	2.3		1000	91	5.2	- 5.2	+ 0.1	2.2			
	500	316	5.5	+ 3.8	- 4.0	2.3		750	78	6.5	- 6.3	- 1.3	2.2			
100 m. above ground.	340	308	3.6	+ 2.8	- 2.2	2.3	500	74	5.6	- 5.4	- 1.5	2.2				
Anemometer.	250	315	2.6	+ 1.8	- 1.8	2.3		340	67	3.2	- 3.0	- 1.3	2.2			
Computed for M.S.L.	(at 13 h.)	321	18.0	+ 11.3	- 14.0	...	Free lift 46 gms.	(at 13 h.)	Indefinite.			...	Free lift 37 gms.			

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

ESKDALEMUIR. P. 100. December 24. 12 h. 38 m. G.M.T.							SOUTH FARNBOROUGH. P. 162. December 1. 15 h. 0 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres. } 2440	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	1.8	Sky entirely clear. Final elevation 37°·5. Balloon lost by bursting.	metres. } 2500	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	2.4	Fairly clear. A.-Cu. ₆ moving from S.W. Balloon lost when faint.	
	... }	...	...	...	...				2430	241	17.1	+15.0		+8.2	
	2000	272	3.0	+3.0	-0.1				2000	240	19.6	+16.8		+9.9	
	1750	249	4.1	+3.8	+1.5				1750	242	19.0	+16.8		+8.8	
	1500	262	2.7	+2.7	+0.4			Pressure Distribution (18 h.).	1500	246	17.0	+15.5		+7.0	
	1250	315	1.1	+0.8	-0.8			The station is at a local maximum of pressure in a complex high-pressure system involving the South Atlantic and most of Europe.	1250	246	17.1	+15.6		+7.0	
	1000	248	1.3	+1.2	+0.5				1000	241	16.5	+14.4		+7.9	
	750	234	2.9	+2.3	+1.7				750	236	14.2	+11.8		+7.9	
	500	270	0.1	+0.1	0.0				500	229	13.1	+9.9		+8.5	
100 m. above ground. Anemometer.	340	315	1.0	+0.7	-0.7				170	209	7.0	+3.4		+6.1	
	250	...	0.0	0.0	0.0		105	200	6.5	+2.2	+6.1				
Computed for M.S.L.	(at 13 h.)	Indefinite.					Free lift 20 gms.	(at 13 h.)	236	20.1	+16.7	+11.2	...	...
								(at 18 h.)	233	17.2	+13.7	+10.3	...	...
SOUTH FARNBOROUGH. P. 164. December 3. 14 h. 35 m. G.M.T.							SOUTH FARNBOROUGH. P. 165. December 5. 9 h. 35 m. G.M.T.								
Greatest height.	2355	...	...	...	...	2.4	Fairly clear. Fr.-Cu. ₃ . Balloon lost when faint.	3920	...	...	...	...	2.4	Very clear. Some Cu., Ci., Ci.-St. ₂ increasing to Ci.-St. ₆ moving from 260°. Balloon lost in distance.	
	...	...	...	...	...				3850	260	30.9	+30.0		+5.3	
	...	...	...	...	...			Pressure Distribution (18 h.).	3500	260	30.3	+29.4		+5.3	
	2285	245	16.3	+14.8	+6.8			North-westerly gradient over England from high-pressure system over S. Europe to deep depression centred near Faroe.	3000	256	20.6	+20.0		+4.9	
	2000	248	17.0	+15.8	+6.3				2500	257	18.3	+17.8		+4.1	
	1750	251	18.1	+17.1	+5.8				2000	259	19.7	+19.3		+3.7	
	1500	247	22.0	+20.2	+8.8				1750	258	19.7	+19.3		+4.1	
	1250	247	24.8	+22.8	+9.8				1500	262	20.9	+20.7		+3.0	
	1000	245	19.7	+17.8	+8.4			1250	262	22.9	+22.6	+3.3			
	750	235	17.1	+14.0	+9.8			1000	262	22.7	+22.5	+3.0			
	500	235	11.1	+9.1	+6.4		750	263	19.8	+19.7	+2.4				
100 m. above ground. Anemometer.	170	227	8.1	+5.9	+5.5		500	248	20.9	+19.4	+7.8				
	105	215	12.0	+6.9	+9.8		170	236	10.7	+8.9	+5.9				
Computed for M.S.L.	(at 13 h.)	253	26.0	+24.9	+7.6	...	...	(at 7 h.)	255	17.3	+16.7	+4.5	...	...
	(at 18 h.)	238	25.6	+21.7	+13.6	...	...	(at 13 h.)	287	21.1	+20.2	-6.2	...	...
SOUTH FARNBOROUGH. P. 168. December 10. 15 h. 15 m. G.M.T.							SOUTH FARNBOROUGH. P. 169. December 14. 14 h. 20 m. G.M.T.								
Greatest height.	3920	...	...	...	...	2.4	Hazy. A.-Cu. ₄ . Balloon lost in haze.	3635	...	...	...	...	2.4	Clear. Sheet of high St.-Cu. spreading over from S. Balloon lost when faint, probably behind cloud.	
	3850	320	8.1	+5.2	-6.2				3500	223	14.1	+9.6		+10.3	
	3500	303	8.4	+7.0	-4.5			Pressure Distribution (18 h.).	3000	230	12.9	+9.8		+8.3	
	3000	326	9.2	+5.1	-7.6			A complex low-pressure system extends from a deep depression in the Atlantic S.W. of Ireland across Southern England and Denmark to Arctic regions. The station is in a col determined by a local high-pressure centre north-east of the Shetlands.	2500	218	12.0	+7.4		+9.4	
	2500	314	6.2	+4.4	-4.3				2000	222	12.6	+8.4		+9.4	
	2000	321	8.7	+5.5	-6.7				1750	227	14.0	+10.3		+9.5	
	1750	322	7.1	+4.3	-5.6				1500	234	13.3	+10.7		+7.8	
	1500	321	5.6	+3.5	-4.3				1250	236	10.3	+8.5		+5.8	
	1250	340	4.4	+1.5	-4.1			1000	238	9.0	+7.6	+4.8			
	1000	17	4.7	-1.4	-4.5			750	236	8.1	+6.7	+4.6			
	750	356	6.0	+0.4	-6.0		500	226	6.8	+4.9	+4.7				
	500	343	6.2	+1.9	-5.9		170	232	4.2	+3.3	+2.6				
100 m. above ground. Anemometer.	170	307	5.0	+4.0	-3.0		105	...	0.0	0.0	0.0				
	105	...	0.0	0.0	0.0										
Computed for M.S.L.	(at 13 h.)	Indefinite.					...	(at 13 h.)	211	7.1	+3.7	+6.1	...	...
	(at 18 h.)							(at 18 h.)					...	...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—*continued*.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 170. December 16. 11 h. 0 m. G.M.T.										SOUTH FARNBOROUGH. P. 171. December 17. 7 h. 40 m. G.M.T.									
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.					Vertical Velocity of Balloon.	Cloud Observations and Remarks.			
		Direction.	Velocity.	Components.						Direction.	Velocity.	Components.							
				W.-E.	S.-N.							W.-E.	S.-N.						
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Clear. Ci.-Cu., A.-St. ₇ . St. forming later. Balloon lost when time mark was being made. <i>Pressure Distribution (7 h.).</i> Station in transitional region between shallow low-pressure system extending from Iceland to the Black Sea and anticyclone of weak intensity centred near the Azores. Transition from cyclonic to anticyclonic conditions occurred between 7 h. and 13 h.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Fairly clear. Ci. ₇ moving from N.W. (?) Balloon lost, owing to bad light. <i>Pressure Distribution (7 h.).</i> North-westerly gradient from high-pressure system extending from the Atlantic over Central and Southern Europe to a shallow depression centred near Iceland.					
	3775	...	...	...	...	2.4		3210	...	...	...	...	2.4
	3705	310	10.5	+ 8.0	- 6.7			3140	276	19.6	+ 19.5	- 2.0							
	3500	305	11.5	+ 9.4	- 6.6			3000	273	17.3	+ 17.3	- 0.8							
	3000	315	17.0	+ 12.0	- 12.0			2500	273	13.6	+ 13.6	- 0.7							
	2500	314	15.7	+ 11.3	- 10.9			2000	256	9.0	+ 8.7	+ 2.2							
	2000	330	14.6	+ 7.2	- 12.7			1750	256	11.5	+ 11.2	+ 2.8							
	1750	334	11.8	+ 5.1	- 10.6			1500	254	11.0	+ 10.6	+ 3.0							
	1500	336	15.0	+ 6.0	- 13.7			1250	248	13.4	+ 12.4	+ 4.9							
	1250	341	19.1	+ 6.3	- 18.0			1000	256	13.8	+ 13.4	+ 3.3							
	1000	338	18.5	+ 7.0	- 17.1			750	259	14.8	+ 14.5	+ 2.9							
	750	327	16.1	+ 8.7	- 13.5			500	255	14.9	+ 14.4	+ 3.8							
100 m. above ground. Anemometer.	170	303	12.1	+ 10.1	- 6.6			170	237	8.9	+ 7.5	+ 4.8							
	105	270	6.5	+ 6.5	0.0		105	225	6.5	+ 4.6	+ 4.6								
Computed for M.S.L.	(at 7 h.)	319	15.9	+ 10.4	- 12.0	...	(at 7 h.)	257	16.3	+ 15.8	+ 3.7	...							
	(at 13 h.)	329	17.0	+ 8.8	- 14.6	...						...
SOUTH FARNBOROUGH. P. 172. December 18. 14 h. 50 m. G.M.T.										SOUTH FARNBOROUGH. P. 173. December 21. 10 h. 20 m. G.M.T.									
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Fairly clear. Cu. ₅ at first clearing to Cu. and Ci. ₁ . Balloon lost when time mark was being made. <i>Pressure Distribution (8 h.).</i> Station in region affected by depression of moderate intensity centred over Iceland. High-pressure area extends from Mid-Atlantic to Mediterranean and Central Europe.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Fairly clear. Ci. ₄ . Some Cu. on W. horizon. Balloon lost when faint, owing to vibration. <i>Pressure Distribution (7 h.).</i> Station near centre of a local depression which is on the eastern margin of a low-pressure system of weak intensity extending over the North Atlantic.					
	2925	...	...	...	...	2.4		2640	...	...	...	...	2.4
	2855	250	19.4	+ 18.2	+ 6.7			2500	257	12.9	+ 12.5	+ 3.0							
	2500	253	16.7	+ 16.0	+ 4.8			2000	273	12.8	+ 12.8	- 0.7							
	2000	247	16.7	+ 15.3	+ 6.6			1750	280	12.0	+ 11.8	- 2.1							
	1750	241	15.5	+ 13.6	+ 7.4			1500	275	11.8	+ 11.8	- 1.0							
	1500	245	12.9	+ 11.6	+ 5.5			1250	272	14.8	+ 14.8	- 0.6							
	1250	243	12.7	+ 11.3	+ 5.8			1000	276	15.4	+ 15.3	- 1.6							
	1000	250	11.1	+ 10.4	+ 3.8			750	267	14.6	+ 14.6	+ 0.8							
	750	253	10.1	+ 9.7	+ 2.9			500	263	13.2	+ 13.1	+ 1.6							
	500	246	9.7	+ 8.9	+ 3.9			170	251	7.6	+ 7.1	+ 2.5							
100 m. above ground. Anemometer.	170	242	4.3	+ 3.8	+ 2.0			105	235	4.0	+ 3.3	+ 2.3							
	105	...	0.0	0.0	0.0														
Computed for M.S.L.	(at 13 h.)	235	15.9	+ 13.0	+ 9.1	...	(at 7 h.)	<i>Indefinite.</i>					...						
	(at 18 h.)	223	7.9	+ 5.4	+ 5.8	...	(at 13 h.)					...							
SOUTH FARNBOROUGH. P. 174. December 24. 10 h. 55 m. G.M.T.										SOUTH FARNBOROUGH. P. 175. December 25. 13 h. 10 m. G.M.T.									
Greatest height.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Hazy. Cloudless at first; Ci.-St., Ci.-Cu. ₅ developing rapidly from N.E. Balloon lost in haze. <i>Pressure Distribution (7 h.).</i> Station in irregular high-pressure ridge connecting anticyclones centred in the South Atlantic and Russia respectively.	metres.	Degrees from N.	m/s.	m/s.	m/s.	m/s.	Very hazy. Ci.-Cu., A.-St. ₉ . Ci.-Cu. moving from W.N.W. Balloon lost in St. <i>Pressure Distribution (18 h.).</i> Station in western margin of a great high-pressure system involving all Europe and the South Atlantic.					
	2215	...	...	...	...	2.4		2075	...	...	...	...	2.4
	2145	16	5.3	- 1.5	- 5.1			2000	187	3.1	+ 0.4	+ 3.1							
	2000	48	5.1	- 3.8	- 3.4			1750	182	3.3	+ 0.1	+ 3.3							
	1750	64	6.7	- 6.0	- 2.9			1500	177	3.6	- 0.2	+ 3.6							
	1500	68	7.7	- 7.1	- 2.9			1250	160	5.8	- 2.0	+ 5.4							
	1250	68	8.1	- 7.5	- 3.1			1000	171	9.7	- 1.5	+ 9.6							
	1000	63	7.1	- 6.3	- 3.2			750	179	10.8	- 0.1	+ 10.8							
	750	56	6.9	- 5.7	- 3.9			500	183	11.3	+ 0.5	+ 11.3							
	500	57	6.9	- 5.8	- 3.8			170	171	5.3	- 0.8	+ 5.2							
100 m. above ground. Anemometer.	170	18	2.5	- 0.8	- 2.4			105	...	0.0	0.0	0.0							
	105	...	0.0	0.0	0.0														
Computed for M.S.L.	(at 7 h.)	82	8.7	- 8.6	- 1.2	...		(at 13 h.)	203	28.3	+ 11.1	+ 26.0	...						
	(at 13 h.)		<i>Indefinite.</i>			...						...

8. The Lower Layers of the Atmosphere from the Surface to 3000 metres (10,000 ft.) above Mean Sea Level—continued.
Soundings by Kites (K.) and Pilot Balloons (P.).

SOUTH FARNBOROUGH. P. 177. December 31. 14 h. 15 m. G.M.T.							BENSON. December 21. 12 h. 42 m. G.M.T.								
Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.	
		Direction.	Velocity.	Components.					Direction.	Velocity.	Components.				
				W.-E.	S.-N.						W.-E.	S.-N.			
Greatest height.	metres. 4485	...	...	...	...	2.4	Fairly clear; Ci., Ci.-St.g. Balloon lost in distance.	...	...	...	...	...	...	...
	4415	217	24.9	+15.2	+19.7				...	...	...	...	...	...	...
	4000	227	16.9	+12.4	+11.5				...	...	...	...	...	...	...
	3500	229	14.8	+11.2	+9.6			Pressure Distribution (18 h.).	...	...	...	...	...	...	...
	3000	228	15.3	+11.3	+10.3				...	...	...	...	...	...	...
	2500	245	7.0	+6.3	+2.9			Station in moderate gradient from a high-pressure system over Central Europe to extensive low-pressure system to the west of the British Isles.	...	...	...	...	...	...	Pressure Distribution (18 h.).
	2000	256	7.0	+6.8	+1.7				...	...	...	...	...	...	Station near minimum of a shallow secondary depression on the eastern margin of an extensive low-pressure system in the North Atlantic.
	1750	262	7.5	+7.4	+1.1				...	...	...	...	...	...
	1500	266	10.2	+10.2	+0.7				2400	229	9	+7	+6	...	
	1250	268	11.5	+11.5	+0.4				2000	256	8	+8	+2	...	
	1000	274	10.7	+10.7	-0.8				1500	263	9	+9	+1	...	
	750	284	8.9	+8.6	-2.1				1000	277	9	+8.5	-1	...	
100 m. above ground. Anemometer.	500	280	7.7	+7.6	-1.3				500	288	6	+6	-2	...	
	170	270	5.6	+5.6	0.0			...	...	...	...	...	...
	105	...	?	...	...			...	...	...	...	...	...
Computed for M.S.L.	(at 13 h.) 242	7.4	+6.5	+3.5	...		...	(at 13 h.)	Indefinite.				...		
	(at 18 h.) 228	11.7	+8.7	+7.8	...		...						...

FALMOUTH. P. 76. December 10. 11 h. 0 m. G.M.T.

Soundings with Pilot Balloons.	Height above M.S.L.	Wind.				Vertical Velocity of Balloon.	Cloud Observations and Remarks.
		Direction.	Velocity.	Components.			
				W.-E.	S.-N.		
Greatest height.	metres. 2322	Degrees from N. ...	m/s. ...	m/s. ...	m/s. ...	2.0	Clouds:— 7 ^h 9 S. 11 ^h 1 Ci.-S., Cu. W. 11.30 ^b 1 Ci.-S., Cu. W. 13 ^h 4 Ci.-Cu., S. S.W. 18 ^h 1 Cu. S. Weather:— Fine; considerable sunshine, moderate temperature. Heavy rain following night. Pressure Distribution (7 h.). Station in a col of complex low-pressure system extending from mid Atlantic in an easterly and northerly direction to the Arctic region.
	2000	254	6.2	+6.0	+1.7		
	1750	256	7.1	+6.9	+1.7		
	1500	264	5.8	+5.8	+0.6		
	1250	263	6.8	+6.8	+0.8		
	1000	264	6.4	+6.4	+0.7		
	750	254	6.3	+6.1	+1.7		
	500	251	6.1	+5.8	+2.0		
100 m. above ground. Anemometer.	151	254	3.5	+3.4	+1.0		
	63	...	...	...	...
Computed for M.S.L.	(at 7 h.) (at 13 h.)	Indefinite.					Wt. of balloon 117 gms. Free lift 227 gms.

Note.—In addition to the ascents recorded above, pilot balloons which were lost sight of before reaching a height of 2 kilometres were sent up during the month at the various stations as follows:—Aberdeen 1; South Farnborough 5; Falmouth 1; and Benson 3.

9. The Upper Air: Soundings by Registering Balloons (R.) and Pilot Balloons (P.).

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. December 3.	7 h. 4 m. G.M.T.	SOUNDING No., 300.		Height above M.S.L.	Pressure.	Temperature.		REMARKS.
		PLACE, BENSON.	Temp.			Reading.	Fall per Km.	
GREATEST HEIGHT,	10.0 km.	243 mb.	221° A.	km. 10.00	mb. 243	°A. 221	°C. 0	Gale on preceding evening and following morning.
LOWEST TEMPERATURE,	9.3 km.	275 mb.	220° A.	8.66	300	223	2	
BASE OF STRATOSPHERE,	7.0 km.	388 mb.	224° A.	8.00	332	223	1	Temperature at 7.3 km. 225°.
Type No. 1.				7.00	388	224	8	
				6.79	400	225	8	Possibly H _c should be put at 9.3 km.
				6.00	450	232	9	
				5.28	500	238	9	
				5.00	520	241	9	
				4.00	597	250	9	
				3.98	600	250	8	
				3.00	684	258	7	
				2.82	700	259	7	
				2.50	730	262	7	
				2.00	780	265	7	
				1.81	800	266	7	
				1.50	832	268	7	
				1.00	887	272	7	
				.88	900	274	7	
				.50	944	276	7	
				.03	1000	276	7	
From Daily Weather Chart.	at 7 h.	at 18 h. G.M.T.		Ground M.S.L.	977	281	...	
PRESSURE (M.S.L.),	1005 mb.	1013 mb.		1005	...	...	...
TEMPERATURE,	281° A.	281° A.						
VAPOUR PRESSURE,	...	...				
GRADIENT WIND:—Direction,	255°	237°						
Velocity,	18.8 m/s.	25.5 m/s.						
Correction for Curvature,	-2.0 m/s.	0.0 m/s.						
Final Components, { W. to E.	+16.2 m/s.	+21.3 m/s.						
{ S. to N.	+4.3 m/s.	+13.9 m/s.						

9. The Upper Air: Soundings by Registering Balloons (R.) and Pilot Balloons (P.)—continued.

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. December 13. 10 h. 40 m. (G.M.T.)				SOUNDING No., 301.	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.	PLACE, BENSON.	Reading.			Fall per Km.		
GREATEST HEIGHT, } 9.9 km.	249 mb.	221° A.	Latitude, 51° 37'.	Longitude, 1° 6' W.	km.	mb.	°A.	°C.	Overcast. S.S.W. Inversion 275° to 276° at .8 km. and 272° to 273° at 1.5 km. These inversions are most unusual with so low a barometer.
LOWEST TEMPERATURE, } 8.6 km.	300 mb.	220° A.	Height above M.S.L., } 56 m.	PLACE OF FALL, Amphihill (Beds.).	9.0	283	220		
BASE OF STRATOSPHERE, } 8.6 km.	300 mb.	220° A.	Distance, 61 km.	Orientation, 46° from N.	8.60	300	220	5	
Type No. 1.					8.0	330	225		
					6.72	400	235	8	
					6.0	444	240	8	
					5.16	500	247	8	
					5.00	511	248	8	
					4.00	586	256	7	
					3.82	600	257		
					3.00	669	263	7	
					2.65	700	267		
					2.50	713	267		
					2.00	761	270		
					1.60	800	273	6	
					1.50	811	272		
					1.00	863	276		
					.65	900	275		
					.5	1000	276		
					Ground M.S.L.	983	280
						977

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. December 14. 17 h. 20 m. G.M.T.				SOUNDING No. ?	Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.	PLACE, MUNGRET COLLEGE, LIMERICK.	Reading.			Fall per Km.		
GREATEST HEIGHT, } 13.3 km.	144 mb.	223° A.	Latitude, 52° 38'.	Longitude, 8° 41'.	km.	mb.	°A.	°C.	Calm. Overcast. Very unusual inversion at 5.1 km. 240° at 5.1 km.; 241° at 5.6 km.
LOWEST TEMPERATURE, } 9.3 km.	267 mb.	221° A.	Height above M.S.L., } 15 m.	PLACE OF FALL, Castlemahon, Limerick.	13.00	151	223	0	
BASE OF STRATOSPHERE, } 9.3 km.	276 mb.	221° A.	Distance, 40 km.	Orientation, 230° from N.	12.00	177	223	-1	
Type No. 1.					11.16	200	222		
					11.00	206	222	0	
					10.00	240	222	0	
					9.00	279	222	0	
					8.53	300	224	4	
					8.00	326	226	6	
					7.00	378	232		
					6.61	400	234	6	
					6.00	438	238	2	
					5.07	500	240		
					5.00	505	240	10	
					4.00	581	250	8	
					3.74	600	252		
					3.00	664	258	8	
					2.60	700	261		
					2.50	709	262		
					2.00	757	266	5	
					1.57	800	268		
					1.50	807	269		
					1.00	861	271		
					.65	900	274		
					.50	1000	275		
					Ground M.S.L.	977	278
					

10. Observations of Cloud Motion by Fineman's Nephoscope.—Aberdeen. Taken at 13 h. (1 p.m.) G.M.T.

Date.	Type of Cloud.	Direction from (Deg. from N.).	Computed for 1000 m.			REMARKS.
			Velocity. V.	Components.		
				W.-E.	S.-N.	
1	Ci.	255	m/s. 2.8	m/s. + 2.7	m/s. + 0.7	Ci. of 'false' type.
3	Ci.-Cu.	255	1.7	+ 1.6	+ 0.4	Ci.-Cu. of partially formed type. Observation at 12 h.
7	Cu.	235	21.0	+ 17.0	+ 12.0	[Fr.-Cu. interfered with observation.
8	Ci.-Cu.	240	2.5	+ 2.2	+ 1.3	Ci.-Cu. to A.-Cu. Velocity approximate. Lower cloud,
10	Cu.	79	3.0	- 2.9	- 0.6	Broken Nb.-Cuf.
12	Cu.-Nb.	91	14.0	- 14.0	+ 0.3	Base of cloud measured.
14	St.-Cu.	94	7.4	- 7.4	+ 0.5	
16	St.-Cu.	248	3.0	+ 2.8	+ 1.1	
17	Fr.-Cu.	220	36.0	+ 22.0	+ 28.0	Fine normal type. Observation at 12 h.
18	Ci.-Cu.	229	3.3	+ 2.5	+ 2.2	Velocity approximate. Motion too rapid for accurate
19	A.-St.	159	3.0	- 1.1	+ 2.8	Ci.-Cu. finely cross-striated and thin. [observation.
22	St.-Cu.	70	4.0	- 3.8	- 1.4	Apparently A.-St. cloud; measurement approximate.
23	Cu.-Nb.	63	3.5	- 3.1	- 1.6	Cloud formed from upper parts of Cu.-Nb.
24	St.-Cu.	355	2.5	+ 0.2	- 2.5	
31	Ci.-St.	184	6.0	+ 0.4	+ 6.0	False Ci. in sheets resembling Ci.-St.

11. Solar Radiation at South Kensington.

Day.	OCTOBER.					NOVEMBER.					DECEMBER.					REMARKS.
	Max. Rate, Milli-watts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		Max. Rate, Milli-watts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		Max. Rate, Milli-watts per cm ² .	Daily Amount.		Duration of Bright Sunshine.		
		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.		Joules per cm ² .	% of Ideal.*	Hours.	% of Possible.	
1	47	x 991	60	x 8.5	x 77	29	359	37	2.0	21	24	249	41	2.9	35	
2	23	312	19	0.0	0	20	163	17	0.1	1	21	226	38	0.3	4	
3	x 52	677	43	2.6	23	x 35	368	39	2.5	22	21	316	53	x 5.7	x 70	
4	46	718	46	4.3	38	21	208	22	0.2	3	15	108	19	0.0	0	
5	41	585	38	1.8	16	33	x 472	52	x 6.0	x 63	x 29	x 325	56	4.8	60	
6	29	330	22	0.1	1	31	440	49	2.7	29	10	140	25	0.0	0	
7	41	689	47	4.4	40	26	384	43	2.6	28	14	127	22	0.0	0	
8	40	706	48	5.5	50	31	395	45	2.0	22	24	269	48	3.5	44	
9	42	387	27	1.4	13	30	267	31	0.2	2	5	66	12	0.0	0	
10	39	482	34	1.3	12	26	213	26	1.2	13	13	144	26	0.0	0	
11	41	411	29	1.5	14	8	106	13	0.0	0	10	90	16	0.0	0	
12	30	407	29	0.4	4	23	298	37	3.5	39	15	93	18	0.0	0	
13	20	221	16	0.0	0	10	113	14	0.3	3	19	140	26	0.1	3	
14	11	n 84	6	0.0	0	26	430	55	5.6	62	27	251	46	3.4	44	
15	30	292	22	0.2	2	30	266	35	2.2	25	11	102	19	0.0	0	
16	34	462	36	0.9	8	30	332	44	3.0	34	16	179	33	2.7	35	
17	n 10	342	27	0.0	0	22	368	49	5.5	x 63	22	237	44	1.0	13	
18	33	437	35	0.6	6	18	230	31	1.9	22	9	79	15	0.0	0	
19	44	595	49	4.9	47	6	61	8	0.0	0	7	74	14	0.4	5	
20	24	305	25	0.0	0	26	296	42	2.3	27	20	253	48	1.6	21	
21	31	420	36	1.5	15	13	168	24	0.0	0	22	230	43	3.3	42	
22	39	326	28	1.1	11	23	266	38	1.5	18	7	65	12	0.0	0	
23	24	271	24	0.1	1	n 5	54	8	0.0	0	9	56	11	0.0	0	
24	39	352	32	1.1	10	21	282	42	2.1	25	13	154	29	0.9	12	
25	15	212	19	0.0	0	23	287	43	2.3	27	14	169	32	0.2	3	
26	41	638	59	7.2	72	12	140	21	0.0	0	n 3	45	8	0.0	0	
27	37	533	50	5.6	56	22	246	38	1.2	14	16	192	36	2.2	28	
28	33	463	44	2.5	25	11	69	9	0.0	0	5	n 43	8	0.0	0	
29	30	278	27	1.0	10	11	149	24	0.0	0	19	258	48	1.8	23	
30	24	303	30	1.4	14	n 5	n 46	7	0.0	0	16	228	42	0.0	0	
31	29	276	28	0.2	3						17	149	27	0.1	3	
Total	...	13505	33	60	19	...	7476	31	5.1	20	...	5057	30	35	15	
Mean	33	R=436		H=1.94		21	R=249		H=1.70		15	R=163		H=1.13		
Ratio of Mean Daily Amount to Mean Duration.		$\frac{R}{H} = 225$				$\frac{R}{H} = 146$				$\frac{R}{H} = 144$						

Note.—1 watt per cm² = 14.35 gramme-calories per cm² per minute. 1 gramme-calorie per minute = .07 watt nearly. 1 Joule = 0.239 gramme-calories.

If the heat were distributed throughout the atmosphere, 1000 gramme-calories per cm² would be sufficient to raise the temperature 4°.1 C. It would take 245 gramme-calories per cm² to raise the temperature of the whole atmosphere 1° C.

N.B.—The values of Solar Radiation at South Kensington are obtained from the records of a Callendar Instrument which depends upon the difference of temperature between a black and a bright wire exposed horizontally to radiation from the whole of the sky. The values may be taken as representing the total radiation and the maximum rate of radiation per cm² received by a horizontal surface. If it is desired to compare the values published for Kew and Eskdalemuir in Tables 3 and 4 with the simultaneous value recorded by the Callendar Instrument, the former must be multiplied by the cosine of the zenith distance of the sun at the time of observation. The duration of sunshine in this table is obtained from a Campbell-Stokes Recorder.

For values January to March see p. 24.

For values April to June see p. 58.

For values July to September see p. 86.

* The "Ideal" intensity of radiation at any instant is taken to be a function of the Sun's altitude only. It is approximately the highest intensity recorded at South Kensington for the corresponding elevation of the Sun. The "Ideal" amount for the day is found by integrating the "Ideal" intensity from sun-rise to sun-set: it is the amount which could be recorded on a day when the atmosphere was in its most transparent state from sun-rise to sun-set. A memoir dealing with the subject is in preparation.

METEOROLOGICAL OFFICE OBSERVATORIES.

G E O P H Y S I C A L J O U R N A L , 1 9 1 4 .

A N N U A L S U P P L E M E N T .

**Summary of the Records of Registering Balloon Ascents and Data for
Additional Ascents not included in the Monthly Issues.**

DURING the year thirty-two registering balloons were sent up from Benson, Eskdalemuir, and Pyrton Hill, and of these seventeen were found. Besides these, balloons were sent up by Mr. Cave at Ditcham Park, Petersfield, and by Father O'Leary at Mungret College, Limerick, and of these nine were found. The loss was particularly heavy from Eskdalemuir, the geographical position of the station, S.W. of Firth of Forth and the North Sea, being unsuitable.

Out of the whole set of twenty-six, six failed to reach the stratosphere, and the average of the maximum heights was lower than it has been for many years.

The positions and heights of the different stations are shown in the following table:—

Place.	Latitude.	Longitude.	Height above M.S.L.
			metres.
Pyrton Hill	51° 38' N.	1° 0' W.	150
Benson	51 37 "	1 7 "	57
Ditcham Park	50 57 "	0 56 "	160
Mungret College	52 38 "	8 41 "	15
Eskdalemuir	55 19 "	3 12 "	240

The more salient features of each ascent are given in Table I., which is similar in form to that given for 1913.

As will be seen, half of the ascents were in February, and there were none in March, April, May, and September. The number of ascents is not sufficient to make the annual mean values reliable, but an attempt to form them has been made for the sake of continuity.

TABLE I.

Place.	Date.	Time, G.M.T.	Type.	H _c .	T _c , 200° +	H _t .	T _t , 200° +	P _s .	P ₉ .	T _m , 200° +	D.	B.
		h. m.		km.	°A.	km.	°A.	mb.	mb.	°A.	km.	°
Limerick (Mungret College)	Jan 9	8 0	1	11·8	4	12·7	11	1013	307	56	62?	50?
Pyrton Hill	Feb. 2	7 10	1	11·5	5	14·2	12	1019	305	54	106	50
Ditcham Park	" "	7 6	1	11·0	5	12·0	12	1018	303	53	93	50
Pyrton Hill	" 3	7 0	1	11·3	8	11·7	10	1016	305	54	105	56
Ditcham Park	" "	7 0	1	11·2	7	12·0	8	1006	302	53	96	52
Pyrton Hill	" 4	7 0	2	10·6	10	11·2	10	1017	304	54	33	50
Ditcham Park	" "	7 7	...	...	...	9·4	17	1015	302	53	40	45
Ditcham Park	" 5	15 52	1	10·3	16	13·7	19	1015	302	52	46	22
Pyrton Hill	" 6	7 0	1	10·6	13	11·4	19	1011	298	50	56	22
Ditcham Park	" "	7 1	...	...	...	8·7	...	1009	...	...	50	15
Pyrton Hill	" 7	7 0	...	...	...	...	...	1006	...	...	91	37
Eskdalemuir	" "	7 0	1	8·0	25	12·0	25	1002	288	47	75	0
Pyrton Hill	Mar. 7	10 0	1	10·3	10	13·6	21	1001	293	49	200	105
Limerick (Mungret College)	" 24	18 30	...	8·0	21	13·4	16	990	278	39	58	107
Benson	June 3	7 2	1	11·9	11	18·0	19	1025	317	60	63	150
Eskdalemuir	" "	7 26	...	...	...	6·5	47	1025	...	...	30	140
Eskdalemuir	" 5	7 2	...	...	...	6·5	56	1018	...	...	75	158
Benson	July 2	7 6	1	11·2	21	14·0	30	1004	318	64	104	0
Benson	Aug. 21	11 30	...	...	...	6·6	47	1019	...	...	18	64
Eskdalemuir	" "	11 55	1	10·4	25	17·4	?	1017	314	61	74	45
Benson	Oct. 1	7 0	2	10·8	20	17·8	20	1026	317	62	104	112
Benson	Nov. 6	15 37	1	8·3	20	12·6	19	1002	292	49	112	2
Limerick (Mungret College)	" 18	16 50	...	10·8	8	13·3	9	1034	304	52	51	180
Benson	Dec. 3	7 5	1	7·0	24	10·0	21	1005	285	43	158	55
Benson	" 13	10 40	1	8·6	20	9·9	21	977	283	48	61	46
Limerick (Mungret College)	" 14	17 20	1	9·3	21	13·3	23	?	279	45	40	230

H_c denotes the height in kilometres of the base of the stratosphere.
 T_c " the corresponding temperature in degrees absolute (273° A. = 0° C.).
 H_t " the maximum height (height of the top).
 T_t " the corresponding temperature.
 P_s " the pressure at mean sea-level in millibars.

P₉ denotes the pressure at 9 km.
 T_m " the mean temperature of the air column between 1 and 9 km.
 D " the distance the balloon travelled in km.
 B " the bearing in degrees from north of the falling place measured through east.
 Type, see page 6.

The mean for each month has been formed, and then the annual mean formed from the monthly means. The missing months have been ignored, since they lie at about the time of average values.

ANNUAL MEANS AT DIFFERENT HEIGHTS (200° +).

	Ground.	1 km.	2 km.	3 km.	4 km.	5 km.	6 km.	7 km.	8 km.	9 km.	10 km.	11 km.	12 km.	13 km.	14 km.
	°A.	°A.	°A.	°A.	°A.	°A.	°A.	°A.	°A.	°A.	°A.	°A.	°A.	°A.	°A.
1908-1911	82·6	77·0	72·6	67·7	61·7	55·5	48·9	41·8	35·0	28·9	23·1	19·6	19·5	19·8	20·0
1912	80·1	75·6	70·9	65·8	60·0	53·9	46·2	39·8	32·1	26·1	21·2	21·4	21·6	21·8	22·0
1913	81·8	76·9	71·9	66·3	60·3	54·0	46·1	38·1	32·0	24·9	19·8	17·0	17·9	18·2	18·6
1914	83·6	78·7	74·3	68·6	62·0	54·6	47·9	40·5	33·5	27·1	21·1	18·0	18·0	19·5	20·1

The values for previous years are given for comparison, and the difficulty of the paucity of observations at the greatest heights has been met in the same way as in previous years.

The mean value of H_c, corrected for the seasonal distribution and for the surface pressure, comes out as 10·7 km., so that the low values of 1912 and 1913 have not been repeated.

The number of ascents is not sufficient to render the values of the correlation coefficients of much value, and hence they have not been calculated.

The poor heights reached and the large number of failures to obtain records up to 10 km. were due to the difficulty in obtaining good balloons; and the firm which had supplied the balloons with excellent results for many years was changed in the spring. The difficulty, however, still continues. The great reduction in the total number of observations is due to three causes—the giving up of the station at Manchester, the unavoidable removal of the chief station of the Meteorological Office from Pyrton Hill to Benson, and the war. It was hoped that the deficiency of the first half of the year might be made up in the latter half, but, owing to the war, for some months in the autumn no balloons were obtainable, and there were difficulties with other requisite stores.

The Upper Air: Additional Soundings by Registering Balloons.

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. March 24. 18 h. 30 m. G.M.T.				SOUNDING No., 59.		Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.	PLACE, MUNGRET COLLEGE, LIMERICK.	Latitude, 52° 38' N.	Longitude, 8° 41' W.			Reading.	Fall per km.	
GREATEST HEIGHT, } 13·4 km.	140 mb.	216° A.	Height above M.S.L., } 15 m.	52° 38' N.	8° 41' W.	km. 13'00	mb. 148	°A. 217	°C. +2	The pressure gradient is complex. The station is in a secondary system lying to the eastward of a more typical depression of moderate depth, in the Atlantic.
LOWEST TEMPERATURE, } 13·4 km.	140 mb.	216° A.	PLACE OF FALL, Mullicavat, Kilkenny.	Distance, 58 km.	Orientation, 107° from N.	12'00	174	219	+1	
BASE OF STRATOSPHERE, } 8·0 km.	323 mb.	221° A.				11'12	200	220	0	
Type No. 3. * Indefinite.						11'00	203	220	-1	
						10'00	237	220	0	
						9'00	277	219	+2	
						8'48	300	220	+3	
						8'00	323	221	+6	
						7'00	377	224	+6	
						6'62	400	226	+6	
						6'00	439	230	+6	
						5'13	500	236	+8	
						5'00	508	237	+9	
						4'00	586	244	+8	
						3'82	600	246	+8	
						3'00	672	253	+8	
						2'69	700	256	+9	
						2'00	767	261	+9	
						1'68	800	264	+7	
						1'00	874	270	+7	
						'76	900	...	...
							1000	...	...
						Ground M.S.L.	986	277	...	
							988	...	...

TABLE OF HEIGHTS, PRESSURES, AND TEMPERATURES.

1914. Nov. 18. 16 h. 50 m. G.M.T.				SOUNDING No., 60.		Height above M.S.L.	Pressure.	Temperature.		REMARKS.
Height above M.S.L.	Pressure.	Temp.	PLACE, MUNGRET COLLEGE, LIMERICK.	Latitude, 52° 38' N.	Longitude, 8° 41' W.			Reading.	Fall per km.	
GREATEST HEIGHT, } 12·3 km.	177 mb.	209° A.	Height above M.S.L., } 15 m.	52° 38' N.	8° 41' W.	km. 12'00	mb. 187	°A. 209	°C. -1	Inversion 267° to 275° at 1·4 km. on one trace and 270° to 275° between 1·0 and 1·5 km. on the other.
LOWEST TEMPERATURE, } 10·8 km.	227 mb.	208° A.	PLACE OF FALL, Mallow, Cork.	Distance, 51 km.	Orientation, 180° from N.	11'58	200	208	+4	
BASE OF STRATOSPHERE, } 10·8 km.	227 mb.	208° A.				11'00	220	208	+8	
Type No. 1.						10'00	258	212	+8	
						9'07	300	219	+8	
						9'00	304	220	+8	
						8'00	353	228	+8	
						7'18	400	235	+8	
						7'00	410	236	+8	
						6'00	474	244	+8	
						5'62	500	247	+7	
						5'00	554	252	+7	
						4'26	600	257	+8	
						4'00	622	259	+8	
						3'08	700	266	+6	
						3'00	708	267	+6	
						2'03	800	273	-3	
						2'00	803	273	+7	
						1'10	900	270	+7	
						1'00	912	270	+7	
						'26	1000	275	...	
						Ground M.S.L.	1031	277	...	
							1033	...	...

Seismology at Eskdalemuir, 1914.

The seismological equipment remained the same as in 1913, and a description of it, together with some notes on the working of the instruments, is to be found in the Supplement for that year.

The use of the Milne instrument was discontinued in the spring.

A partial standardisation of the horizontal Galitzin seismographs was made in January 1914, and a more complete one in the following June. The constants thus obtained are set out below in the notation employed by Prince Galitzin in his *Vorlesungen über Seismometrie*, and reproduced by G. W. Walker, F.R.S., in *Modern Seismology*.

Date.	1914, January 22 to 26.		1914, June 13.	
	N.—S. Seismograph.	E.—W. Seismograph.	N.—S. Seismograph.	E.—W. Seismograph.
T ₁	24.7 secs.	24.8 secs.	Assumed same as in January	
T	...	22.3 secs.	22.9 secs.	23.4 secs.
μ ²	...	+0.15 approx.	-0.02	+0.02
2Ak	...	86400	86000	88200

The following constant was assumed to have suffered no change since its original determination :—

<i>l</i>	118 mm.	118 mm.	118 mm.	118 mm.
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The January observations of T and μ² were rendered uncertain owing to disturbing microseismic movements.

The magnification for long-continued sinusoidal waves was computed from the June constants by the expression

$$\frac{AkT_p}{\pi l} \frac{1}{(1+v^2)^2} \text{ where } v = \frac{2T_p}{T+T_1};$$

this simplified form of Galitzin's complete expression

$$\frac{AkT_p}{\pi l} \frac{1}{(1+u^2)(1+u_1^2)\sqrt{1-\mu^2 f(u)}}$$

was considered sufficiently accurate in view of the satisfactory adjustment of the pendulums.

The computed scale-values ran as follows :—

Complete Period of Earth-Wave in Seconds.	Microns in Ground, per Millimetre on Paper.	
	N.—S. Component.	E.—W. Component.
3	2.97	2.89
4	2.28	2.22
5	1.88	1.83
7.5	1.39	1.35
10	1.19	1.16
12.5	1.12	1.09
15	1.12	1.08
20	1.25	1.20
30	1.92	1.83
40	3.16	2.96

In order to find out whether convection currents or other air disturbances inside the covers of the Galitzin pendulums might be a cause of disturbance of the trace, some experiments were made in January 1914. A large open vessel of calcium chloride was placed inside the cover of one of the horizontal Galitzin pendulums. The other horizontal Galitzin pendulum was screened by a blanket carefully folded over the frame without touching the moving parts, and the cover was placed over all. In neither case could any difference be found between the records so obtained and those produced under normal conditions.

Another experiment was made to confirm the reality of microseisms, on which doubt has been cast in some quarters. The lever and writing point of the Omori instrument were removed, an oil damper was added, and the motion of the tip of the boom was magnified by a microscope and recorded photographically. On computing the amplitude of the microseismic ground-motion by the ordinary theory of the damped horizontal pendulum (*e.g.* Walker's *Modern Seismology*, p. 5), it was found to agree to within 30 per cent. with that given by the Galitzin instrument. The period also agreed roughly. Considering the blurred character of the experimental trace, a closer agreement could not be expected.

These two experiments were made with the help of Mr. J. H. Burgess of Shide Observatory, then on a visit to Eskdalemuir.

Since December 1914 a monthly earthquake bulletin has been issued.

Throughout the year the seismological instruments and observations were in charge of Mr. L. H. G. Dines, M.A., A.M.I.C.E., professional assistant.

Seismology at Kew Observatory, 1914.

The accompanying list gives some particulars of the principal earth movements recorded at Kew Observatory during 1914 by the Milne seismograph in the basement. The boom is oriented north-south, and so is affected by east-west tiltings.

The amplitudes mentioned are the deflections measured on the trace. The movements of the boom are very imperfectly damped, so that the movements shown by the trace give no exact measure of the corresponding earth movements. At the same time, really large movements on the trace always imply earthquakes of considerable magnitude, and large earthquakes always produce considerable movements on the trace when the instrument is in proper working order.

Throughout the year the period of the boom was 18 seconds. 1 mm. deflection on the trace was produced by a tilting varying from $0''\cdot44$ to $0''\cdot50$.

EARTHQUAKE RECORDS BY MILNE SEISMOGRAPH (Times—G.M.T.).

Kew Observatory.

Date.		Commencement.		Max.		Max. Amplitude.	Duration.	Remarks.
		h.	m.	h.	m.	mm.	h. m.	
January	30	3	52.9	4	47.3	8.7	7 54	Another small movement with max. at 8 h. 47 m. Preceded by numerous AT's or BOT's (slight). Sharp commencement.
March	14	20	21.9	20	49.3	2.5	1 3	
"	30	0	53.3	1	32.1	5.6	2 52	
April	11	17	10.9	18	5.0	1.3	2 18	(W. Africa?). East Indies.
May	26	14	43.2	15	35.6	8.6	4 25	
June	25	19	24.7	20	14.2	2.1	2 36	Jamaica.
August	4	22	55.6	23	19.7	6.5	3 23	Asia Minor.
October	3	17	32.4	17	56.2	4.1	3 25	Asia Minor.
"	"	22	12.7	22	25.0	5.0	2 42	
"	23	6	35.6	7	30.6	2.4	2 12	
November	18	...	...	10	32.2	1.5	...	Commencement and end masked by AT's.
"	24	12	6.7	12	53.7	2.9	2 51	
"	27	14	44.9	14	55.5	1.7	?	End lost in tremors.
"	28	11	8.6?	11	41.6	1.1	?	Time of commencement doubtful. (Ionian Islands.)

A.T. denotes atmospheric tremors.

B.O.T. denotes broadening of trace, too small to measure.

Tables of Monthly Means of Electrical and Magnetic Data for Richmond, Kew Observatory, and Eskdalemuir, 1914.

Kew.

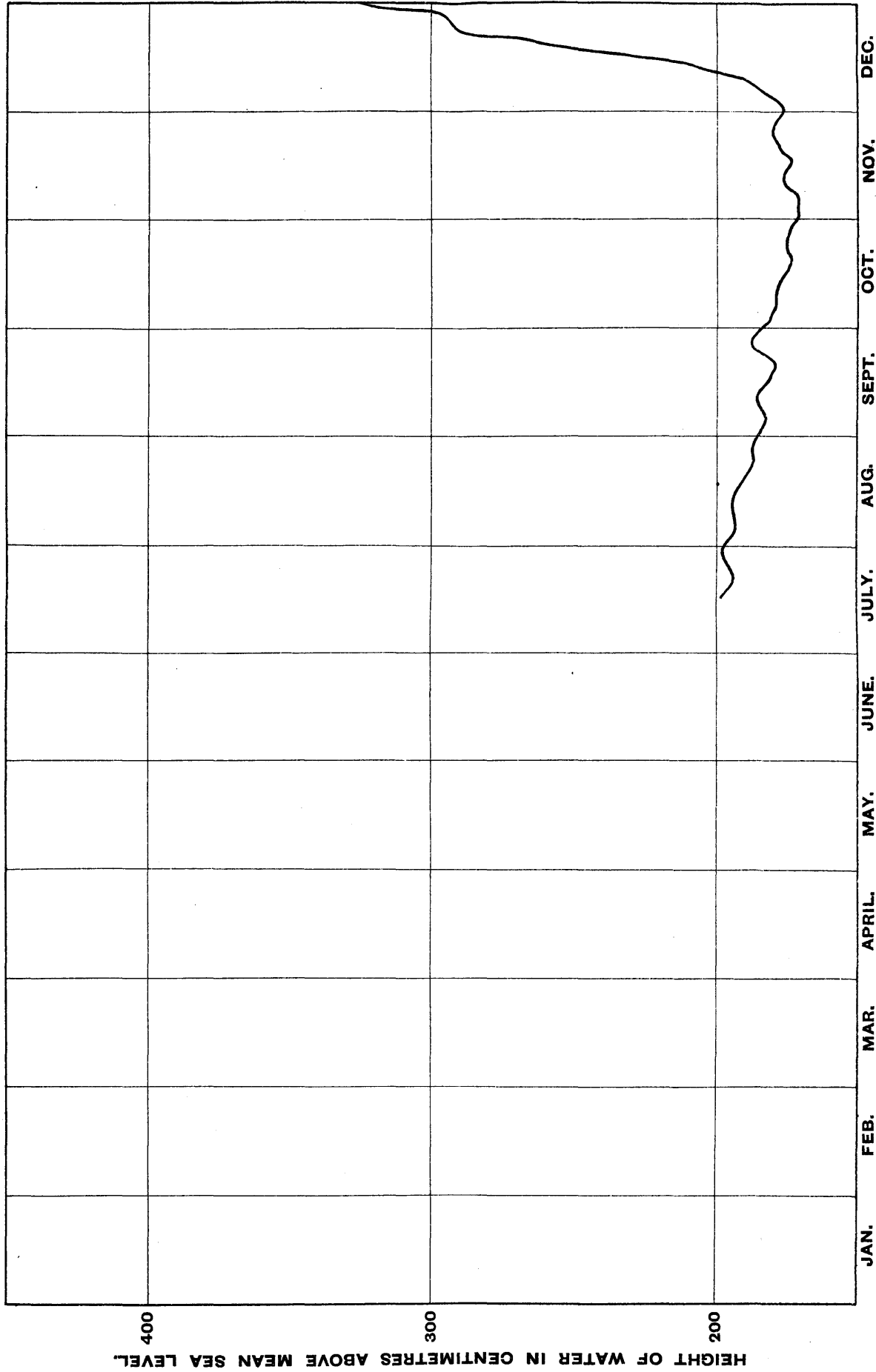
Month.	Charge per cc. $\times 10^{20}$.		Horizontal Force.			West Declination.			Declination Range, Equivalent Force.
	+	-	Max. 18000 γ +.	Min. 18000 γ +.	Range.	Max. 15° +.	Min. 15° +.	Range.	
January	E.-m. U. 325	E.-m. U. 250 <i>n</i>	γ 507	γ 483	γ 24 <i>n</i>	34.8	29.2	5.6 <i>n</i>	γ 30 <i>n</i>
February	310 <i>n</i>	305	509	481	28	34.9	27.9	7.0	38
March	420	445	509	471	38	35.9	25.0	10.9	59
April	625	445	513	465	48	36.2 <i>x</i>	24.3	11.9	64
May	685	470	513	467	45	34.3	23.8	10.5	56
June	820 <i>x</i>	500 <i>x</i>	518 <i>x</i>	464	54	34.7	22.7	11.9	64
July	650	425	518 <i>x</i>	456	62 <i>x</i>	34.0	22.1	12.0	65
August	790	450	511	449	62 <i>x</i>	33.8	21.1	12.7 <i>x</i>	68 <i>x</i>
September	740	465	498	446 <i>n</i>	52	32.5	20.3	12.2	66
October	500	320	500	451	49	30.8	20.4	10.4	56
November	430	310	500	459	41	28.5	19.1 <i>n</i>	9.4	51
December	550	320	498	468	30	26.5	19.1 <i>n</i>	7.4	40
Year	570	390	508	463	44	33.1	22.9	10.2	55

Eskdalemuir.

Month.	Charge per cc. $\times 10^{20}$.		North Component.			West Component.			Vertical Component.		
	+	-	Max. 15000 γ +.	Min. 15000 γ +.	Range.	Max. 5000 γ +.	Min. 5000 γ +.	Range.	Max. 45000 γ +.	Min. 45000 γ +.	Range.
January	E.-m. U. ...	E.-m. U. ...	γ 1021	γ 992	γ 29 <i>n</i>	γ 164	γ 131	γ 33 <i>n</i>	γ 257 <i>x</i>	γ 245	γ 12 <i>n</i>
February	...	...	1020	987	33	162	120	42	249	232	17
March	...	...	1033	979	54	167	104	63	246	222	24
April	...	...	1034	964	70	169 <i>x</i>	102	67	231 +	187	44 + <i>x</i>
May	...	...	1036	974	62	157	101	56	213	185	28
June	...	...	1043	975	68	158	89	69	206	171	35
July	...	...	1046 <i>x</i>	969	77	159	88	71 <i>x</i>	205 +	175	30 +
August	686	470	1044	960	84 <i>x</i>	155	84	71 <i>x</i>	205	172	33
September	588	404	1030	956 <i>n</i>	74	148	79	69	196	163	33
October	1276	446	1036	967	69	141	80	61	195	165	30
November	928	377	1026	970	56	127	72 <i>n</i>	55	181	157 <i>n</i>	24
December	867	384	1022	982	40	120	76	44	176	161	15
Year	...	...	1033	973	60	152	94	58	213 +	186	27 +

KEW OBSERVATORY. WATER LEVEL RECORD, 1914.

HEIGHT OF GROUND ABOVE MEAN SEA LEVEL = 550 CENTIMETRES.



The foregoing tables give the mean monthly values of the plus and minus electrical charges in the atmosphere per c.c., as observed with the Ebert apparatus at Kew and Eskdalemuir. There were no data for the earlier months of the year at the latter Observatory.

The table also gives the mean monthly values of the daily maximum and minimum, and the corresponding daily range, of the magnetic elements at the two Observatories, as deduced from the curve measurements. There are vertical force data only for Eskdalemuir.

The Kew declination ranges have been converted into the equivalent force to facilitate comparison with Eskdalemuir. As usual, x and n denote the highest and lowest of the monthly means. The vertical force trace at Eskdalemuir got beyond the limits of registration on one day in April and one day in July, the value accepted for the maximum in either case representing the upper edge of the photographic sheet.

The mean values of the maximum and of the daily range of vertical force for these two months are thus underestimates, but the differences from the true values are probably small.

It will be observed that the Kew declination ranges and the Eskdalemuir west component ranges follow a very similar course throughout the year; while the Eskdalemuir range is the larger in eleven months out of the twelve, the excess in no case exceeds 6γ . The horizontal force range at Kew Observatory, Richmond, also follows a similar course to the north component range at Eskdalemuir, but the former range is only about three-fourths of the latter. At both Observatories January was decidedly the month of lowest daily range, a position generally held at Kew by December.

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

		Maximum.	Minimum.	Range.
Kew	{ Horizontal Force	18551 γ	18366 γ	185 γ
	{ Declination	15° 45'6	15° 5'1	40'5
Eskdalemuir	{ North Component	16154 γ	15798 γ	356 γ
	{ West „	5259 γ	4979 γ	280 γ
	{ Vertical „	45527 γ +	44977 γ	550 γ +

The Water-Level Recorder at Richmond, Kew Observatory.

The water-level recorder consists of a well opening into the seismograph room of the Observatory. For purposes of measurement a hollow metal ball floats on the surface of the water, having attached to it a metal ribbon graduated in decimetres and centimetres. To the upper end of the ribbon are fastened two light threads slung over a pulley, carrying at their free ends a counter-balancing weight which also serves to keep the ribbon and threads taut. The mouth of the well is covered with a wooden lid with a suitable slot for the graduated ribbon. To the lid is fixed a metal pointer with a sharp horizontal edge which rests close to the graduated face of the metal ribbon. The readings opposite to this edge give a measure of the relative heights of the water in

the well at different times. The graduations are so arranged that the eye reading increases as the height of the water above mean sea-level increases.

The threads attached to the metal ribbon carry a pen which gives a continuous record of the movement of the float on a chart which is changed weekly.

By means of an actual measurement of the depth of water below the floor of the seismograph room, and the known height of the floor above mean sea-level, the relation was found between the eye readings from the ribbon and the actual height of the water above M.S.L.

The heights of the water above M.S.L. are obtained by subtracting 72 cm. from the readings on the ribbon. This is based on the assumption that the floor of the seismograph room is 480 cm. above M.S.L., two independent measurements having given 477 cm. and 480 cm. respectively.

The continuous record shows no regular diurnal variation, *i.e.* the daily variations of level in the tidal water of the River Thames, which surrounds the Observatory on three sides—south, west, and north,—are normally not indicated in the level of the underground water.

Regular observations commenced in July 1914. The values of the mean height— $\frac{1}{2}$ (maximum + minimum)—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 most readily derived from the diagram facing page 121.

Errata in the Geophysical Journal for the Year 1914.

Page 7.—Table 2.—7th, Magnetism, *for* "17909" *read* "17908"; 21st, *for* "17916" *read* "17915."

Pages 8, 18, 26, 36, 48, 60, 68, 78, 88, 96.—Table 3.—Solar Radiation, *for* "Milliwatts" *read* "Watts."

Page 9.—Table 5.—6th, Remarks, *for* "10" *read* "22."

Page 13.—No. R.D.P. 51.—Greatest Height, *for* "1.2" *read* "12.0."

Page 17.—Table 2.—21st, Magnetism, *for* "17901" *read* "17900."

Page 23.—Sounding No. 281.—Fall per km., *for* "4, 1, 3" *read* "−4, −1, −3"; and Remarks, *for* "7 km." *read* ".7 km."

Pages 24, 58, 86.—Remarks, line 5, *for* "0.7" *read* ".07."

Page 25.—9th, Magnetism, *for* "17875" *read* "17876"; 21st, *for* "17890" *read* "17889."

Page 35.—7th, Magnetism, *for* "17855" *read* "17879"; 21st, *for* "17857" *read* "17875"; Mean, *for* "17856" *read* "17877."

Page 96.—Table 4.—Solar Radiation, *add* 10th .062, 14th .066, 16th .066, 17th .072.

Page 107.—Table 6.—21st, Minimum West Component, *for* "−16 n" *read* "≧ −16 n."