

Official No. 62.

THE
MONTHLY WEATHER REPORT
OF THE
METEOROLOGICAL OFFICE

For the Year 1884.

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ERRATA.

In the Report for January, page 2, line 4 from the bottom, for "0.96 inch between 6 p.m. and 10 p.m.,"
read "0.98 inch between 6 p.m. on the 19th and 4 a.m. on the 20th."

" " page 4, column 3, in the Remarks for Cyclonic System No. II., *delete* the
sentence commencing with "Between 6 p.m." and ending with "at Nairn."

P R E F A C E.

THE area to which the Monthly Weather Report applies is mainly that contained between the 40th and 65th parallels of North Latitude, and the Meridians of 15° East and West of Greenwich, the British Isles lying nearly centrally within it.

The information on which it is based is derived chiefly from the Daily and Weekly Weather Reports issued by this Office, and the observations made over the United Kingdom at some additional Stations which supply observations for the Weekly Weather Report. These have occasionally been supplemented by reference to the "Bulletin International" of Paris and the North German Weather Reports.

The report for each month is divided into three sections as follows:—

Section 1.—A general summary of the chief features of the weather for the month, showing the most marked variations which have occurred, arranged with reference to the principal changes which have taken place in the distribution of atmospheric pressure during the period.

Section 2.—Tables of the principal Cyclonic and Anticyclonic Systems, showing the size, movements, and other peculiarities of each.

Section 3.—Remarks on the distribution of Wind, Pressure, Temperature, Vapour, Rainfall, and Bright Sunshine for each month, accompanied by Tables showing the mean values for the different meteorological elements at the Stations already mentioned; and by Plates which show the relative prevalence of wind from each of eight points, the distribution of mean Pressure, the movements of the depressions referred to in Section 2, the distribution of mean Temperature, and the amount of Rainfall measured at each station.

The charts in the Daily and Weekly Reports show, for 8 a.m. and 6 p.m., the distribution of Pressure, Wind, &c. over the British Islands and their neighbourhood.

Section 1 needs no explanation.

Section 2.—Some of the terms employed may usefully be explained.

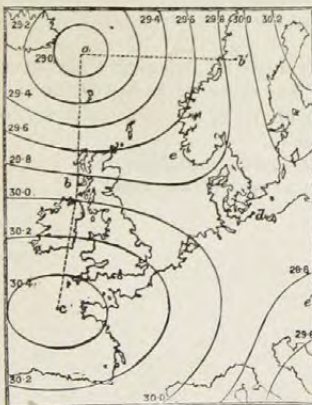
The area enclosed by the outermost of a system of isobars in which the pressure decreases from without inwards, is termed an "area of low pressure," or "cyclonic area," or "depression."

Similarly, the area enclosed by the outermost of a system of isobars in which the pressure increases from without inwards, is termed an "area of high pressure," or "anticyclonic area."

The "size" of either system is the extent of the area enclosed by such outermost isobar.

The "form" of the system is the generalized form of its isobars. As the isobars are only roughly similar to one another, this definition does not admit of much precision.

The centre of a cyclonic or anticyclonic system is the point at which the pressure is least or greatest respectively. The centres of the systems shown in the diagram are marked "a" and "c." The position of the centre is not in general known from direct observation, but may be inferred with a sufficient approach to the truth from the form of the interior isobars.



The "depth" of a cyclonic system, and the "height" of an anticyclonic system, difference between the height of the barometer at the centre, and at the bounding isobar of the system, which for both systems would pass through the point "b" in the diagram. The motion of the system is that of its centre.

The area of somewhat high pressure (marked "d" in the diagram), which unites the high-pressure system over the Bay of Biscay with that over northern Europe, is termed a "ridge" or "col"; while the arm of relatively low pressure (marked "e"), which extends south-eastwards from the cyclonic system towards the col, is termed a "hollow."

The gradient between two places is measured by the proportion which the difference between the simultaneous heights of the barometer at those places bears to the distance between them. The barometric differences are expressed in decimals of an inch, and 15 nautical miles is the unit of distance. The gradient is thus virtually expressed in terms directly comparable with the French measure, in which the units are millimetres for barometric height, and a degree of the meridian (or 60 nautical miles) for distance. The gradients are always to be measured at right angles to the isobars.

In describing the size, depth, or rate of motion of Cyclonic systems, the following scales of nomenclature have been employed :—

SIZE	-	{	Very small	-	When the radius of the outer isobar is less than 50 miles.									
			Small	-	" " " " is more than 50, less than 150 miles.									
			Moderate	-	"	"	"	"	150	"	300	"		
			Large	-	"	"	"	"	300	"	500	"		
			Very large	-	"	"	"	"	500 miles.					
DEPTH	-	{	Very shallow	-	When the difference of pressure between the margin and centre does not exceed 0.2 in.									
			Shallow	-	"	"	"	"	"	"	varies from 0.2 to 0.5 in.			
			Moderate	-	"	"	"	"	"	"	0.5	"	0.9	"
			Deep	-	"	"	"	"	"	"	0.9	"	1.4	"
			Very deep	-	"	"	"	"	"	"	exceeds 1.4 in.			
RATE OF MOTION	-	{	Very slow	-	When the average rate during the period referred to is less than 10 miles per hour.									
			Slow	-	"	"	"	"	"	ranges from 10 to 20 miles per hour.				
			Moderate	-	"	"	"	"	"	"	20	"	35	"
			Rapid	-	"	"	"	"	"	"	35	"	50	"
			Very rapid	-	"	"	"	"	"	exceeds 50 miles per hour.				

For Anticyclonic systems, the scale of nomenclature for rate of motion has been retained, but for size and height the following rules have been observed :—

For size, anticyclones have been divided into only two classes: (1) Large—or those which cover extensive tracks of the earth's surface, which (as a rule) travel very slowly, and of which only a small portion is usually observable over our area; (2) Small—or those which either (a) are subsidiary to larger anticyclones, or (b) appear as a temporary phenomenon, between two cyclonic disturbances, often travelling at a considerable rate.

For the height of Anticyclonic systems the following scale is employed :—

Very small	when the difference between the pressure at the outer isobar and that at the centre is 0.2 in., or less.
Small	" " " " is more than 0.2 " but does not exceed 0.4 in.
Moderate	" " " " 0.4 " " 0.7 "
Great	" " " " 0.7 " " 1.0 "
Very great	" " " " exceeds 1.0 "

The approximate values for the highest pressures about the centre of each anticyclone are quoted in figures whenever they are known.

The form of an anticyclonic system cannot always be ascertained, as it frequently happens that the greater part of it lies over localities for which the observations are either altogether wanting, or are very few in number.

In Section 3 the tables contain the mean values of the chief meteorological elements for each month; (1) for the Telegraphic Reporting Stations, and (2) for the additional stations which furnish information for the Weekly Weather Report.

The Plates are as follow :

(I.) A Wind Chart showing by "area wind-roses" the prevalence of the wind from each of eight points; the frequency of winds blowing from between any specified points being indicated by the *area* of the portion of the wind-rose comprised between the corresponding limits. In the roses here employed the total area of those portions of the rose which indicate the winds and calms respectively (viz., the "petals," and the small shaded central circles) is equal to one-half the area of the circle round, or within, which they are drawn.

(II.) A Monthly Weather Chart, exhibiting :—

(1.) The Distribution of Mean Pressure, shown by isobars, drawn for each half-tenth of an inch, the mean barometric readings employed being those for 8 a.m. recorded at our Telegraphic Reporting Stations.

(2.) The Movements of the Depressions are shown in the following manner. The position of the centre of each of the chief depressions is determined as nearly as possible for 8 a.m. and 6 p.m. on each day during which it was within the area of our information; and these points are united by straight lines. The lines have arrow-heads drawn on them, showing the direction of the movements.

(3.) The Distribution of Mean Temperature, shown by isotherms drawn for each degree Fahrenheit; the mean temperatures employed being the numerical means of the maxima and minima for each day recorded at the Stations of the Second Order and the Telegraphic Reporting Stations. A correction at the rate of 1° F. for each 300 feet of vertical height has been added to the mean values in order to reduce them to the sea level.

(4.) The Rainfall chart shows in figures the Total Amount of Rain recorded during the month at each station. The values are inserted close to a dot, indicating the geographical position of the station to which they refer.

The following TABLE gives for each MONTH and for each degree of latitude from 58° N. to 49° N., the total number of hours during which the SUN IS ABOVE THE HORIZON. These values have been used in calculating the "PERCENTAGE OF POSSIBLE DURATION" of BRIGHT SUNSHINE recorded each month at the various Stations supplied with SUNSHINE RECORDERS, and given in the last columns of the second TABLE in SECTION 3 of each Report. The Reciprocal for each value is given in an adjoining column.

(NOTE.—The numbers given are calculated for the mean declination of the years 1877–80, for apparent time, and with no allowance for refraction, &c.)

DEGREES OF LATITUDE.																				
58°.		57°.		56°.		55°.		54°.		53°.		52°.		51°.		50°.		49°.		
No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	No. of Hours.	Reciprovals.	
JANUARY - -	219	*0046	225	*0044	231	*0043	237	*0042	242	*0041	246	*0041	251	*0040	257	*0039	262	*0038	268	*0037
FEBRUARY - - 267	237	*0039	240	*0038	243	*0038	245	*0038	247	*0037	249	*0037	251	*0037	253	*0036	255	*0036	257	*0036
MARCH - -	361	*0028	362	*0028	363	*0028	363	*0028	364	*0027	364	*0027	364	*0027	364	*0027	364	*0027	364	*0027
APRIL - -	426	*0023	423	*0024	421	*0024	419	*0024	418	*0024	415	*0024	412	*0024	411	*0024	410	*0024	409	*0024
MAY - -	510	*0020	504	*0020	499	*0020	495	*0020	491	*0020	486	*0021	482	*0021	477	*0021	473	*0021	468	*0021
JUNE - -	534	*0019	526	*0019	517	*0019	511	*0020	505	*0020	499	*0020	493	*0020	488	*0020	484	*0021	480	*0021
JULY - -	532	*0019	525	*0019	518	*0019	512	*0020	505	*0020	500	*0020	494	*0020	490	*0020	485	*0021	481	*0021
AUGUST - -	467	*0021	463	*0022	460	*0022	457	*0022	454	*0022	450	*0022	446	*0022	444	*0023	442	*0023	440	*0023
SEPTEMBER -	378	*0026	377	*0027	376	*0027	375	*0027	374	*0027	374	*0027	374	*0027	374	*0027	373	*0027	372	*0027
OCTOBER - -	312	*0032	314	*0032	316	*0032	318	*0031	321	*0031	322	*0031	324	*0031	326	*0031	327	*0031	329	*0030
NOVEMBER - -	239	*0043	235	*0043	239	*0042	245	*0041	250	*0040	254	*0039	257	*0039	262	*0038	266	*0038	271	*0037
DECEMBER -	195	*0051	202	*0050	209	*0048	216	*0046	223	*0045	228	*0044	234	*0043	239	*0042	243	*0041	248	*0040

MONTHLY WEATHER REPORT.

JANUARY 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE principal features in the weather of this month have been an excess in the mean pressure at our Southern stations, and a deficit in the North; the prevalence of moderate gradients during the earlier portion of the period, and of unusually steep ones later on; and the rapidity with which the changes in pressure took place (readings exceeding $30\cdot6$ inches being recorded over England and Ireland on one occasion, while within 10 days of that time we had depressions in the centre of which the minimum readings ranged from a little below $27\cdot4$ inches to about $28\cdot4$ inches). Then, too, there was the extraordinary warmth of the weather, and the prevalence of a large amount of cloud, but accompanied by comparatively little rain (until after the 19th), and lastly there was the small proportion of Northerly or Easterly wind, contrasted with the extreme violence of the winds from South-west to North-west which prevailed between the 20th and 28th. These give the weather of the month a very decided character. It was generally of a Westerly type, the tracks of the depressions shown in Plate II. lying almost entirely to the North of Scotland, and thereby producing conditions favourable to Westerly winds.

January 1-5.—At the commencement of the month a large anticyclone lay over Germany, where the weather was cold and calm. From this area, as will be seen on the charts in the Weekly Weather Report, No. 1, an extensive arm or ridge of high pressure stretched in a west-north-westerly direction over Denmark, the North Sea, and all the northern parts of the United Kingdom, having slight gradients for South-easterly and Easterly winds on its Southern side, and steeper ones for Westerly winds in the North. Temperature near its centre was rather low, the 8 a.m. readings being 26° at Cuxhaven and 28° at Fano and the Helder; fogs prevailed within its limits, and over the whole of our islands the period was particularly dull and sunless, the maximum duration of bright sunshine during the week in any district being four hours! The barometer then fell gradually, the ridge became less clearly defined, and moved eastward, the winds veered towards South and freshened, temperature and humidity rose, and the system finally disappeared from our area on the 5th. On the 2nd a cyclonic system, apparently rather large, advanced towards the Atlantic coasts of Europe, from the south-westward, but on its eastern edge reaching the Bay of Biscay the centre appears to have moved northward, and to have passed in that direction outside our extreme western coasts on the 3rd. It was during this movement that the wind veered from South-east to South over our islands, and mild showery weather set in, but the centre of the depression was too far from our coasts for its track to be drawn on Map 2, Plate II. A shallow subsidiary system was formed over England as the centre passed by, and this made the winds South-westerly for a time over the southern counties. On the 4th another small depression appeared over the Baltic near Gothland. It was apparently subsidiary to a larger system whose centre lay over Northern Russia, and soon passed away to the south-eastward, without affecting the winds over the United Kingdom.

January 5-11.—During this period, of nearly a week, gradients for Westerly winds prevailed over the United Kingdom, the North Sea, and France. In the south they were slight,

but in the north moderate. The winds experienced were chiefly from between West and South, and (except on the 6th and 11th) were of no great strength. Temperature was high for the season, the maxima reaching 55° in many places on the 9th, and the rainfall slight; but, except in the east of Scotland and the Channel Islands, the deficiency of bright sunshine was still notable. It was during the earlier part of this period that the cyclonic system No. 1 (page 4) passed over our area, and later on anticyclone No. 1 (page 6) was formed over France. In addition to these, an apparently well-formed depression passed in a north-easterly and northerly direction outside our extreme north-western coasts early on the 8th, and caused the wind to freshen considerably from South-west and South over the northern and north-western parts of the kingdom; but its distance from our islands was too great for its influence to be felt much in the east and south, or for its movements to be shown on Map 2.

January 12-14.—During this interval the distribution of pressure, as shown by the maps in the Weekly Weather Report, No. 2, was mainly favourable for the prevalence of North-westerly winds. In the extreme West of our islands and over the Bay of Biscay the conditions were anticyclonic, and the winds moderate; but over the North Sea they were cyclonic, and the winds proportionately stronger. Temperature at first fell quickly, so that the 12th was one of the coldest days that were experienced over our islands throughout the month. The 13th and 14th, however, were warmer, as owing to the appearance of some small depressions off the north-west coast of Norway, and to a slight southerly motion of the high pressure area in the west, the wind backed somewhat to the Westward on those days. The weather remained fair over the greater part of the United Kingdom, but some cold showers fell in the extreme west and north-west, as well as on the eastern shores of the North Sea. The period was in fact transitional from the Westerly type last mentioned, to the anticyclonic and North-westerly period which now came on. On the 14th and 15th two small depressions, subsidiary to larger systems over Northern Russia, passed over the Northern parts of Scandinavia and the Gulf of Bothnia, in a direction about parallel to the broken line marked A on Map 2. Their effect on the winds over our islands was extremely slight, but Westerly and North-westerly gales were felt on the Eastern shores of the North Sea.

January 15-18.—A great change now took place. A well-defined anticyclone appeared off our western coasts and moved slowly in a south-easterly direction to France and the Mediterranean, the eastern and northern parts of the system passing over the British Islands also. Westerly breezes prevailed in the north, North-westerly in the east, Northerly over France, and North-easterly on our south-west coasts and over the Bay of Biscay. Temperature decreased somewhat at first, but soon rose again, and the mean for the period, notwithstanding the anticyclonic tendency, remained decidedly higher than that for the corresponding portion of the 20 years 1861 to 1880. The rainfall was very slight, except in the Northern parts of Scotland, but the sky was on the whole cloudy, sometimes foggy, and as a result the amount of bright sunshine recorded was extremely small, except at our Eastern stations. The anticyclone now reached France, and the weather completely lost the "open" character hitherto exhibited.

January 19-28.—This was an interval during which storms of unusual violence passed rapidly over North-western Europe from the Atlantic. The general type of the weather was Westerly, but for variations in pressure, violence of wind and amount of electrical disturbance (especially between the 25th and 27th), the period was most remarkable. The first depression reached us on the evening of the 19th, advancing towards the Hebrides from the south-westward. So steep were its gradients and so rapid its motion that at Stornoway the barometer fell no less than 0.96 inch between 6 p.m. and 10 p.m. Strong to violent South-westerly gales were experienced over the greater part of Scotland and fresh gales in the west of Ireland, with rain. The centre reached our shores during the night, so that it has been found impossible to draw the track accurately; but so far as can be judged, it appears

to have moved in about the direction shown by the broken line marked II. on the map. This was the first of a series of storms which gradually spread more and more over the country, and culminated in the gale of extraordinary severity January 26th-27th, during which the barometer fell to below 27·4 inches in the East of Scotland. An analysis of each of these cyclones will be found in the Table of Cyclonic Systems, pp. 4 and 5, and their movements on map 2, Plate II. The temperature of the period was rather high, but occasionally (as the wind veered to the North-west and lulled between two storms) the thermometer fell considerably. It was owing to such conditions that many of our stations recorded their lowest temperatures for the month on the 27th, immediately in the rear of storm No. VI. Rainfall was greatly in excess; large quantities of snow fell in the North, and a smaller amount in most other places; hail showers with thunder and lightning were reported in several localities.

Their positions at 8 a.m. and 6 p.m. on each day are shown in the Weekly Weather Report, No. 4, and as, owing to interruptions in telegraphic communications caused by the violence of these storms, the charts published in the Daily Weather Reports were very incomplete, those for the 26th, 6 p.m., and the 27th, 8 a.m., were reproduced on page 4 of the Daily Weather Report for February 22.

January 29-31.—The weather now changed slowly to a more Southerly type, and conditions improved generally. The wind backed slowly round to the Southward, pressure soon recovered, temperature, after the decided fall just mentioned, rose again quickly, and although the cyclonic system No. VII. appeared off our North-west coasts on the 30th, its distance from us was too great for our weather to be much affected by it except in the most western and northern parts of the kingdom.

SECTION II.

TABLE OF CYCLONIC SYSTEMS, JANUARY, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. I. January 5-7.	No. II. January 19-20.	No. III. January 21-22.
Form - - - - -	Nearly circular - - - - -	Unknown; portion visible nearly circular.	Not known; apparently nearly circular.
Size - - - - -	Large - - - - -	About North-easterly - - - - -	Very large - - - - -
Depth - - - - -	Moderate - - - - -	Deep. Gradients exceedingly steep near centre.	Deep - - - - -
Where first Observed - - -	Off the W. of Scotland - - -	To North-westward of the Hebrides -	Off the N.W. of Scotland - - -
Direction of Motion - - -	North-easterly then Easterly - -	North-easterly - - - - -	North-easterly - - - - -
Rate of Motion - - - - -	Moderate to slow - - - - -	Apparently very rapid at first then more moderate.	Very rapid - - - - -
Regions passed over by Steepest Gradients.	Northern parts of British Isles and the North Sea.	N.W. and N. of Scotland - - -	N.W. parts of our Islands and Scandinavia.
Termination - - - - -	Dispersed over S. of Sweden - - -	Travelled away to the North-eastward	Passed away to North-eastward -
Time under Observation - -	About 2 days - - - - -	1 day - - - - -	About 24 hours - - - - -
Accompanying Winds - - -	Southerly, strong to a gale, to W. and N.W., strong in places.	Heavy South-westerly gales in Scotland; fresh South-westerly gales in W. of Ireland.	Strong South-westerly gales in the W. and N. strong South-westerly winds in S.
" Weather - - - - -	Mild, squally, and showery, improving after centre passed.	Somewhat rainy in extreme N. and W. Violent squalls in far N.	Rainy in N. and extreme W., cloudy elsewhere; mild generally in our islands, colder over France.
" Rainfall - - - - -	General, greatest in N.W. and N., but not heavy anywhere.	Not heavy; fall confined to W. and Northern districts.	Very partial, not heavy (see above).
REMARKS - - - - -	<p>This disturbance appeared first, when a large, but irregularly shaped anticyclone lay over Germany, the S. of Sweden, and the S. and E. of France, while readings were lowest to the Westward and North-westward of our islands. As it advanced pressure gave way very decidedly over Northern Europe, while in its rear the barometer rose and the N.E. part of an anticyclonic area appeared off our S.W. coasts, the gradients over our islands thus becoming Westerly for a time.</p> <p>The advance of this depression toward the Hebrides was extremely sudden. At 6 p.m., 19th, there was hardly any indication of its approach. Between 8 p.m. and 10 p.m. the barometer at Stornoway fell 0.96 in., and at 10 p.m. the pressure at Stornoway was 0.75 in. lower than that at Nairn. The tract of the disturbance cannot be accurately drawn, but it was approximately that shown in map 2 (Weather Chart).</p> <p>This commenced a week of very stormy weather.</p> <p>In its rear a well marked subsidiary disturbance passed from W. to E. by our extreme Northern coasts. Its centre at 8 a.m. on 21st lay over Norway, whence it passed across Scandinavia to Russia.</p> <p>This disturbance appeared when pressure was highest (30.74) over France and lowest to the Northward of our islands, the gradients being moderate over the United Kingdom, but rather steep between Scotland and Norway. It was the second of a series (see pp. 2 and 3) which lasted for about a week, and which gradually spread more and more over the country. It was followed by a very decided subsidiary disturbance, the centre of which passed over the Northern parts of Ireland and England late on the 22nd.</p>		

SECTION II.

TABLE OF CYCLONIC SYSTEMS, JANUARY, 1884.

No. IV. January 23-24.	No. V. January 25.	No. VI. January 26-27.	No. VII. January 30.
Varying; nearly circular at first, central part, then became elongated and complex.	Uncertain, but approaching to circular	Nearly circular - - - -	Uncertain, but apparently nearly circular near the centre.
Large - - - - -	Very large - - - - -	Very large - - - - -	Unknown; apparently moderate.
Deep - - - - -	Uncertain, but apparently very deep (minimum below 28' 5 in.).	Very deep, (minimum reading below 27' 4 ins.)	Deep.
Off the W. of Scotland - - -	Not far from the Farø Isles - -	Off the W. of Ireland - - -	To the North-westward of the Hebrides.
Easterly - - - - -	North-easterly - - - - -	North-easterly - - - - -	North-easterly.
Moderate - - - - -	Rapid - - - - -	Moderate - - - - -	Moderate.
British Isles, Channel, N. of France, and N. Germany.	Scandinavia and the Northern parts of the British Isles and North Sea.	The British Isles, North Sea, and N. of France.	The Northern and North-western parts of our Islands.
Dispersed over the Southern parts of the Baltic on 24th.	Passed away to North-eastward -	Travelled away to North-eastward and apparently began to fill up.	Travelled away North-eastwards and apparently dispersed.
About 36 hours - - - - -	1 day - - - - -	About 36 hours - - - - -	1 day.
Strong South-westerly to Westerly gales on the Southern side of the centre; fresh Easterly and North-easterly winds followed by W. and N.W. gales in the N.	South-westerly to Westerly in our Island, strong to a gale.	Very severe South - westerly to Westerly gales over nearly the whole of Western Europe, North-easterly to North-westerly winds at our Northern stations.	South-westerly to Westerly gales in the W. and N.; fresh W.S.W. winds over England.
Mild and rainy except in N., where cold, with much snow.	Squally, showery, changeable, rather cold; much lightning at night.	Heavy squalls, and considerable changes of temperature; much rain, and some snow over England and Ireland; much snow Scotland. Lightning vivid over England at night.	Showery everywhere; snow, hail, and lightning in N., thunderstorms in W.
Very general; snow in N. breaking telegraph wires badly.	Very general; sleet and snow in N. -	Very general; heaviest in the W.	
At the time of the approach of this disturbance the high pressure area lay further to the Southward than it had previously done, viz., over Spain and the S.W. of France. The depression followed closely on No. II., but its track lay further to the Southward, and hence the Easterly winds in the N. Its disappearance over the Baltic during the 24th was very remarkable.	This depression came on while pressure was still highest in the far S. (Mediterranean and S. of France). It followed very quickly on No. III., but its track lay further to the Northward. It was accompanied (or followed closely) by several subsidiary disturbances, the two largest of which passed over the Shetland Isles on the 25th, and the other over the S. of England on the night of the 25th-26th producing strong Westerly gales even in the Channel and over our Southern counties.	This was the deepest depression we have had for some years. It advanced to our shores when pressure was highest over the Mediterranean and Austria; the area of highest pressure having shown a tendency to move slowly to the Eastward. Its depth was very great, readings as low as 27' 38 in. having been reported from Dundee, while those in the S. of France were about 30' 2 ins.	Pressure at the time of the advance of this depression was still highest over the Mediterranean and S. of France, and lowest to the Northward of our Islands, the gradients being rather steep. Its influence on the winds over England was very slight, although gales were experienced in Ireland and Scotland.

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS, JANUARY, 1884.

NATURE OF CHARACTERISTICS OBSERVED.		No. I. January 10.	No. II. January 16-22.
Form	- - - - -	Oval	Somewhat oval.
Size	- - - - -	Large	Large.
Height	- - - - -	Small	Small.
Where first Observed	- - - - -	Over France	Over Ireland and the Bay of Biscay.
Direction of Motion	- - - - -	None	Easterly, variable, and South-easterly.
Rate of Motion	- - - - -	None	Very slow.
Regions passed over	- - - - -	Remained over France	Ireland, England, and France.
Termination	- - - - -	Broke up	Moved South-eastwards to the Mediterranean.
Accompanying Wind	- - - - -	South-westerly over our Islands, Easterly in S. of France, Southerly over Brittany.	North-westerly to South-westerly in our Islands, Easterly in the S. of France, moderate to light.
Weather	- - - - -	Rather cold and foggy over France, clear towards its outer margin.	Rather cold and foggy near its centre. Mild over our Island.
REMARKS	- - - - -	<p>Although the temperature in this system was low, when compared with that of the surrounding regions, it was not nearly so low as that observed in the anticyclones at this season during the past few years, and its central area (of very uniform pressure), was decidedly small.</p> <p>It finally became merged in, and formed a "ridge" to the Atlantic anticyclone, which apparently extended itself over Spain, from the Westward.</p> <p>This anticyclone moved Southwards and South-eastwards very slowly as the cyclones, which began to appear in the extreme N. and N.W. of our Islands on the 19th, spread gradually over us. By 8 a.m. on the 27th its centre was entirely outside our area over the Mediterranean, and its intensity had decreased very decidedly.</p> <p>Pressure remained highest over Southern Europe and the Mediterranean till the close of the month.</p>	

SECTION III.

REMARKS FOR JANUARY 1884.

(Tables I. and II., with Plates I. and II.)

Pressure.—The mean pressure for the month varied from a little above 30·2 inches at Jersey, and from about 30·15 inches along the south coast of England, to about 29·63 inches on the north coast of Scotland, and to 29·53 inches at Sumburgh Head. These values show an excess of about 0·2 inch above the average at the southern stations, but a deficit of about 0·05 inch in the North of Scotland. The gradients are consequently rather steep for the time of year, and are favourable for winds from a more Westerly point than those usually experienced. The highest readings (30·6 +) were recorded at the English and Irish stations on the 15th or 16th, during the prevalence of anticyclone No. II., but in Scotland the highest values (30·4 to 30·5) were registered on the 1st in the ridge of high pressure which at that time stretched over to the north of Great Britain from Germany. The lowest readings reported occurred everywhere between the 23rd and 27th, and in most places they were noted on the 26th, when the deep cyclonic system No. VI. travelled over the country. The range was very large—about 3 inches.

Movements of Depressions.—These are shown on Map 2 of the Monthly Weather Chart. Their general direction was east-north-easterly, and their rate of motion considerable. One disturbance, however (No. IV.), moved in a due easterly direction, and its rate of motion was very great. Nearly all of them arrived when pressure was highest over France or the Mediterranean, and lowest to the northward and north-westward of our islands, those which appeared when pressure was highest in the west being at too great a distance from us to be included in the list of cyclonic systems which passed over or near to the United Kingdom.

Anticyclones.—These were only two in number, and present no features worthy of special remark, except that within their area the temperature was not nearly so low as in those of recent years.

Winds.—The prevalent winds during the month were Westerly and South-westerly, especially at some of the more northern stations, where they formed nearly 75 per cent. of the total number of the observations recorded. Occasionally the wind veered to the North-westward for a brief interval; *e.g.*, in the rear of some of the larger depressions, and also in front of the high-pressure areas noticed in the west and south-west between the 12th and 16th. Winds from the Northward and Eastward were hardly ever reported, the few exceptions to this rule being (1) at the more southern of our stations, about the beginning and middle of the month, and (2) in the north of Scotland between the 25th and 27th, when the depressions travelled on tracks sufficiently far south for the Northerly and Easterly winds on their northern and north-western sides to be felt in the Hebrides, Shetlands, and north of Scotland. In force the winds were, as a rule, moderate, but the gales which prevailed between the 19th and 27th were of unusual violence.

Temperature.—The mean values for the month ranged from 48°·7 at Scilly and 48°·1 at Valencia to between 39° and 40° over Scotland. In all places the values exceeded the averages for January in the 20 years 1861–1880. On our south-western coasts the excess amounts to 2° or 3°; over Ireland it is slightly larger; over England it varies from 5° to 6°, while in Scotland it appears to have been about 3° or 4°. Relatively cold air prevailed over the inland parts of the North of England and Ireland, and a very local patch of cold appears (as is frequently the case in winter) over Gloucestershire. The difference between the temperature over the inland counties and at stations on the coast was not nearly so great as it is often found to be, and this is probably to be accounted for by

absence of anticyclonic conditions over our islands and by the large amount of cloud which has prevailed. Radiation of heat from the earth has thus been greatly checked, and the distribution of temperature rendered more uniform. The lowest readings for the month were generally recorded as follows : over the greater part of England on the 1st, but in most other places between the 23rd and 27th, in the intervals between the various depressions which were then passing over the country. The highest were registered on very various dates, the most marked agreement being found over the western districts, where the 4th and 5th were the warmest days. The range was not large anywhere, as, although the thermometer rose to between 55° and 57° in many places, it did not sink very low at any of our stations except Hawes Junction (1,135 feet above the sea) and Brookeborough.

Vapour Tension.—This was high generally for the time of year, but especially on our western and southern coasts. The mean values for the month varied from 0·30 inch at Valencia and 0·31 inch at Scilly, to 0·20 inch at Aberdeen. *Relative Humidity* ranged from between 90 and 94 at our southern and western coast stations to between 80 and 85 at the Scotch stations and in the north-east of England.

Rainfall.—During the first part of the month the fall of rain varied greatly in different localities. It was somewhat less than the average in the east and south of England, as well as in the north of Scotland, but more than the average elsewhere, especially over the western parts of Ireland and Scotland. During the second and third weeks there was a deficit everywhere, but from the 20th to the end of the month the fall was greatly in excess, and consisted largely of snow in the north. Taking the month as a whole, however, there was a great excess in the northern and north-western parts of the United Kingdom, and a considerable deficit in the east and south. This might have been expected when we see how constantly the centres of the low pressure areas passed to the North-westward and Northward of the British Islands, thus producing heavy falls of rain over those regions, while England escaped. The largest amounts in 24 hours occurred between the 2nd and 4th, both in the south of Ireland and north-east of England, but in other places the maximum fall occurred during the storms at the close of the month. None of them were, however, very excessive.

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS

MADE AT

TELEGRAPHIC REPORTING STATIONS IN THE BRITISH ISLANDS,

DURING THE MONTH OF JANUARY 1884.

TABLE I.

SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC

Observations are made at 8 a.m. daily, but the Number of Days of Rain, Snow, Hail, Thunder-

(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 35° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head - - -	ins. 29° 53'1	40° 6	35° 9	43° 8	39° 9	27	26th	49	15th
	Wick - - -	29° 6'46	39° 5	34° 7	43° 2	39° 0	24	26th	51	15th
	Stornoway - - -	29° 6'48	40° 0	34° 9	43° 8	39° 4	21	26th	50	8th, 18th, 21st.
1. SCOTLAND, E.	Nairn - - -	29° 7'01	39° 3	35° 8	43° 6	39° 7	26	2nd, 26th	52	8th, 19th, 21st.
	Aberdeen - - -	29° 7'29	39° 6	34° 6	45° 1	39° 9	25	26th, 27th,	55	15th
	Leith - - -	29° 8'01	42° 4	38° 0	46° 7	42° 4	30	3rd	54	9th
2. ENGLAND, N.E.	Shields - - -	29° 8'79	42° 9	38° 5	47° 1	42° 8	30	28th	55	9th
	York - - -	29° 9'06	42° 4	38° 4	47° 8	43° 1	31	28th	54	9th, 10th, 22nd, 23rd, 29th.
	Spurn Head - - -	29° 9'61	41° 6	37° 7	45° 7	41° 7	32	26th	54	29th
3. ENGLAND, E.	Yarmouth - - -	30° 0'41	41° 0	37° 4	45° 9	41° 7	33	1st, 2nd, 28th	55	30th
	Cambridge - - -	30° 0'76	41° 8	37° 4	48° 5	43° 0	32	2nd, 16th, 29th	56	23rd, 30th
4. MIDLAND COUNTIES	Loughborough - - -	30° 0'31	41° 9	38° 7	47° 8	43° 3	31	27th	54	2nd, 29th
	Oxford - - -	30° 1'01	43° 1	40° 1	48° 4	44° 3	32	1st, 2nd	55	30th, 23rd
5. ENGLAND, S.	London - - -	30° 1'20	42° 7	39° 5	48° 8	44° 2	32	1st	56	29th
	Dover - - -	30° 1'28	42° 7	39° 4	47° 3	43° 4	32	1st	51	21st, 22nd, 23rd, 29th.
	Hurst Castle - - -	30° 1'47	44° 3	41° 0	49° 0	45° 0	34	1st, 2nd	53	23rd
6. SCOTLAND, W.	Ardrossan - - -	29° 8'32	43° 1	38° 9	46° 3	42° 6	29	3rd	50	4th, 5th, 8th
7. ENGLAND, N.W.	Hawes Junction* - - -	28° 1'662	38° 1	33° 8	41° 8	37° 8	18	27th	48	4th, 5th
	Barrow-in-Furness - - -	29° 9'34	43° 0	39° 7	46° 1	42° 9	33	2nd, 8th,	49	4th, 5th, 9th, 10th, 22nd, 23rd.
	Liverpool - - -	29° 9'75	43° 5	40° 6	47° 7	44° 2	33	2nd, 3rd, 26th, 28th.	54	29th, 30th, 22nd, 29th
	Holyhead - - -	29° 9'84	45° 4	40° 9	48° 2	44° 6	32	28th	53	22nd
8. ENGLAND, S.W.	Pembroke - - -	30° 0'51	46° 7	43° 4	78° 7	46° 1	33	28th	52	4th
	Prawle Point - - -	30° 1'59	45° 8	41° 5	48° 8	45° 2	33	28th	53	4th
9. IRELAND, N.	Donaghadee - - -	29° 8'97	42° 8	39° 0	46° 9	43° 0	29	27th	54	22nd
	Mullaghmore - - -	29° 8'62	44° 5	41° 0	48° 5	44° 8	31	27th	54	4th
10. IRELAND, S.	Parsonstown - - -	29° 9'72	44° 0	39° 9	48° 9	44° 4	30	27th, 28th	55	22nd
	Valencia - - -	30° 0'06	48° 4	43° 8	52° 3	48° 1	33	27th	55	3rd, 22nd, 23rd, 29th, 31st.
	Roche's Point - - -	30° 0'34	46° 5	42° 5	51° 0	46° 8	34	27th, 28th	55	29th
CHANNEL ISLANDS	Scilly (St. Mary's) - - -	30° 1'36	48° 9	46° 0	50° 9	48° 4	39	2nd	54	9th
	Jersey (Noirmont) - - -	30° 2'07	45° 0	41° 6	48° 7	45° 2	34	1st	55	23rd

* Hawes Junction is 1,135 feet above Mean Sea Level and the

TABLE I.

REPORTING STATIONS in the BRITISH ISLANDS, during the Month of January 1884.

storms, and Gales are counted irrespective of the hours at which the phenomena occurred.
beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calms.
ins.	°/100	8'4	ins.	ins.																	
219	87	8'4	5'27	0'67	30th	28	2	0	0	0	19	5	4	3	0	2	2	3	10	6	1
208	86	6'5	3'68	0'55	27th	23	3	3	1	5	12	9	1	0	0	3	4	5	7	11	0
230	94	7'4	9'00	1'35	27th	27	5	4	1	7	19	10	1	0	1	2	6	3	12	4	2
211	88	6'0	3'77	0'44	1st, 26th	22	7	0	0	9	11	5	0	0	1	1	1	7	13	2	6
204	84	5'2	3'02	0'87	23rd	17	5	1	0	12	10	5	0	0	0	2	3	10	14	2	0
229	85	6'1	3'18	0'52	29th	19	2	0	0	6	9	5	0	0	0	5	2	2	18	4	0
233	84	8'4	2'83	0'53	3rd	18	2	0	0	2	20	12	0	0	1	2	2	10	15	1	0
235	87	7'9	3'10	0'62	3rd	18	0	0	0	5	22	1	0	0	2	2	4	7	14	2	0
239	92	5'6	1'87	0'43	23rd	11	2	0	1	8	9	5	0	0	1	3	6	6	12	3	0
231	90	6'5	1'39	0'29	26th	18	1	1	0	2	9	6	0	0	1	2	3	9	12	3	1
239	91	6'9	1'45	0'26	26th	15	0	0	0	7	20	1	0	0	2	2	3	13	9	2	0
232	88	8'1	2'49	0'39	23rd	17	2	1	0	1	19	12	0	0	2	3	2	8	10	3	3
250	89	7'5	2'16	0'40	26th	18	1	1	0	7	19	3	0	0	2	2	3	13	9	2	0
241	88	7'7	1'93	0'38	25th	17	2	0	0	4	18	6	0	0	2	0	6	11	9	2	1
244	88	5'5	2'02	0'32	25th	18	0	1	1	10	12	3	3	0	1	1	1	4	16	4	1
270	93	6'7	2'74	0'48	26th	18	0	0	1	3	8	7	1	1	2	0	4	7	11	4	1
261	93	8'5	6'28	0'62	29th	29	5	4	0	1	21	10	0	3	1	2	2	8	13	2	0
219	95	9'7	11'09	2'01	22nd	28	6	0	0	1	30	8	0	2	1	2	1	8	15	2	0
249	90	8'4	5'01	0'85	3rd	24	0	3	0	1	21	6	0	3	0	5	5	8	6	4	0
241	85	7'1	2'84	0'40	23rd	19	2	2	0	6	16	5	0	0	2	6	2	10	10	1	0
258	86	8'9	3'09	10'44	26th	19	1	1	0	1	22	2	1	0	1	1	6	8	9	4	1
279	88	8'7	3'72	0'61	26th	19	0	2	0	0	20	6	1	0	1	1	6	9	11	1	1
281	92	8'1	3'27	0'45	26th	22	0	0	0	1	18	7	2	1	1	2	2	10	8	3	2
257	94	8'0	5'72	0'95	3rd	25	3	1	1	0	13	7	1	0	0	1	5	4	12	8	0
266	90	8'3	6'24	0'91	22nd	27	2	9	4	2	17	15	0	0	2	2	4	12	7	4	0
250	86	9'1	3'83	0'55	22nd	25	1	0	0	0	25	0	0	0	4	3	5	7	9	2	1
300	89	8'8	6'44	1'22	4th	26	0	3	0	1	22	10	2	0	4	2	5	7	7	3	1
293	93	7'4	7'46	1'06	2nd	21	1	0	0	4	16	5	1	1	0	4	3	7	11	4	0
311	91	8'9	3'19	0'58	26th	21	0	1	1	0	20	7	1	2	1	1	5	9	7	5	0
280	94	8'0	3'52	0'99	26th	20	0	2	2	1	18	7	3	2	2	1	4	7	8	4	0

Barometer readings at that station are not corrected for altitude.

TABLE II.

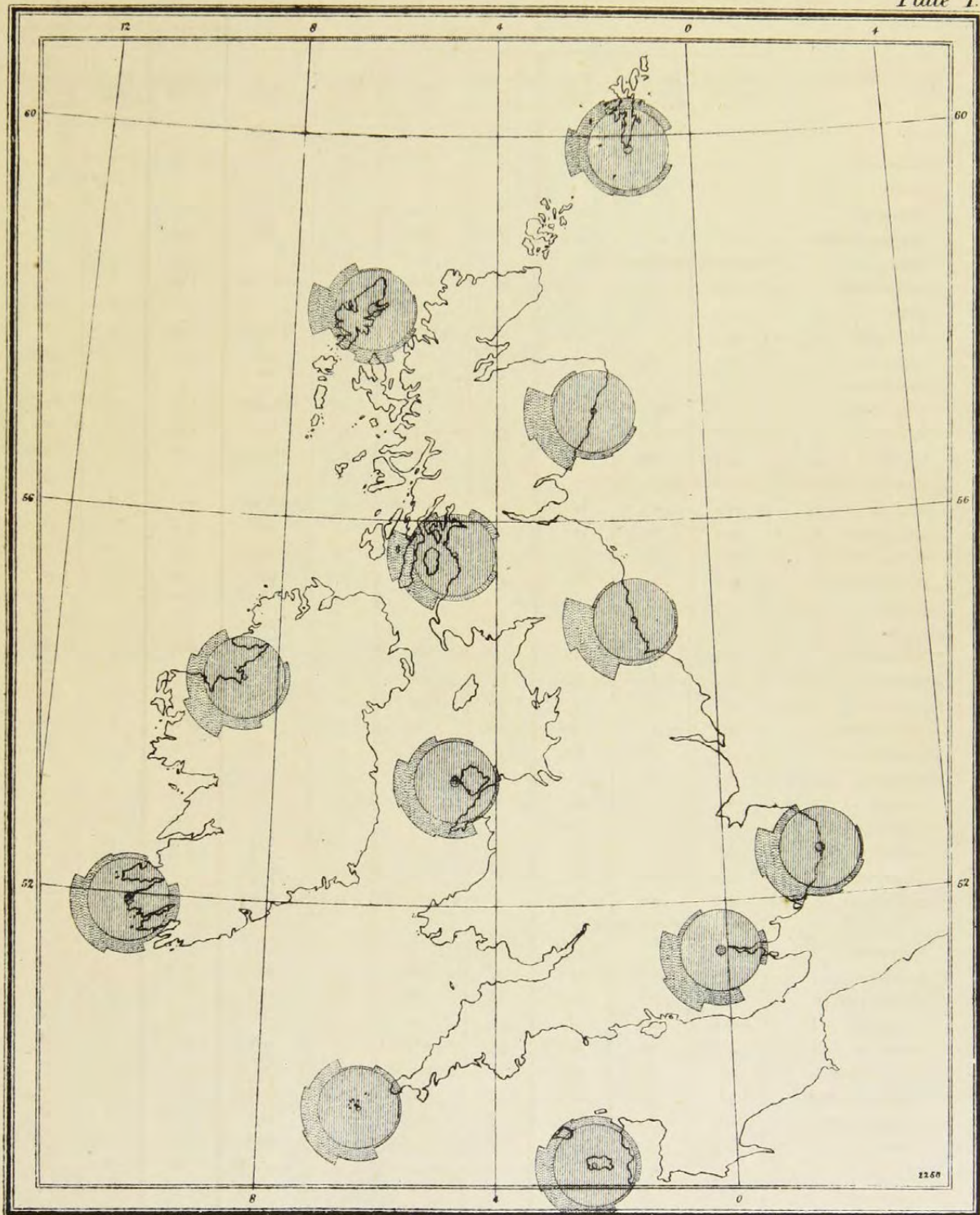
OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT.

STATIONS.	TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of the Daily Minimum.	Means of the Daily Maximum.	Mean Daily Value.	Absolute Minimum.	Date.	Absolute Maximum.	Date.	Amount in Inches.	No. of Hours recorded.	Percentage of possible Duration.
STORNOWAY - - -	*	*	*	*	*	*	*	*	15	7
JERSEY - - -	*	*	*	*	*	*	*	*	50	19
ABERDEEN - - -	*	*	*	*	*	*	*	*	59	26
ALNWICK CASTLE - -	37'9	45'1	41'5	26	2nd	52	9th	3'58	—	—
DURHAM - - -	Information not yet received.									
SCARBOROUGH - - -	38'9	47'2	43'1	32	22nd	54	22nd, 23rd	2'99	—	—
YORK - - -	*	*	*	*	*	*	*	*	24	10
HILLINGTON - - -	37'3	46'5	41'9	30	18th	55	23rd, 31st	1'93	19	8
GELDESTON - - -	38'6	47'2	42'9	33	1st	57	30th	1'40	43	17
CAMBRIDGE - - -	*	*	*	*	*	*	*	*	32	13
ROTHAMSTED - - -	38'4	47'4	42'9	31	1st	54	29th, 30th	2'56	—	—
BAWTRY - - -	38'5	47'3	42'9	32	1st, 26th, 27th, 28th.	55	22nd	2'90	—	—
LEICESTER - - -	39'3	47'5	43'4	31	27th	54	23rd, 29th	2'14	20	8
BIRMINGHAM (Oscott) -	Information not yet received.									
CHEADLE - - -	37'2	46'4	41'8	29	26th, 27th	52	22nd, 23rd	2'98	—	—
CHURCHSTOKE - - -	37'8	47'5	42'7	31	1st, 2nd	54	29th	3'99	24	10
HEREFORD - - -	39'5	48'7	44'1	32	2nd	55	22nd, 23rd, 29th.	2'46	—	—
CIRENCESTER - - -	38'7	47'2	43'0	31	2nd	53	23rd	3'79	30	12
OXFORD - - -	*	*	*	*	*	*	*	*	30	12
LONDON - - -	*	*	*	*	*	*	*	*	16	6
MARLBOROUGH - - -	38'4	46'9	42'7	30	1st	53	30th	3'57	26	10
STRAATHFIELD TURGIS -	39'0	48'9	44'0	30	1st	56	30th	3'02	—	—
HASTINGS - - -	40'0	47'4	43'7	32	1st	51	21st, 23rd, 29th.	3'19	47	18
SOUTHAMPTON - - -	40'6	49'2	44'9	32	1st	55	30th	3'44	31	12
LAUDALE - - -	38'2	48'0	43'1	27	26th	54	11th	11'50	—	—
GLASGOW - - -	37'9	45'3	41'6	27	3rd	50	5th, 9th, 21st, 22nd.	6'53	17	7
SILZOTH - - -	39'7	45'5	42'6	30	3rd	53	5th	6'21	20	8
DOUGLAS - - -	40'7	47'3	44'0	31	27th	55	8th	7'00	32	13
STONYHURST - - -	38'7	46'9	42'8	31	27th	57	23rd	7'52	18	7
BLACKPOOL - - -	39'8	46'2	43'0	31	2nd	51	4th, 5th	4'42	10	4
MANCHESTER - - -	38'1	46'9	42'5	31	2nd, 28th, 29th	53	22nd, 23rd, 29th.	4'92	—	—
LLANDUDNO - - -	One week not yet received.									
PEMBROKE - - -	*	*	*	*	*	*	*	*	20	8
ARLINGTON - - -	40'0	47'6	43'8	30	28th	53	4th	6'08	—	—
CULLOMPTON - - -	39'9	49'1	44'5	32	2nd	55	23rd	4'08	15	6
FALMOUTH - - -	44'1	49'6	46'9	36	1st	54	4th	5'07	22	8
PLYMOUTH - - -	41'9	50'4	46'2	35	1st, 2nd, 28th	55	4th	3'86	17	6
LONDONDERRY - - -	38'2	48'4	43'3	30	26th, 27th	54	5th, 9th, 20th, 21st.	6'46	—	—
MARKREE CASTLE - -	39'3	47'6	43'5	30	27th	53	20th, 22nd, 23rd, 29th.	4'61	22	9
BROOKEBOROUGH - -	37'5	46'2	41'9	19	26th	52	22nd	5'75	—	—
ARMAGH - - -	38'7	46'5	42'6	30	27th, 28th	53	22nd	4'45	22	9
DUBLIN - - -	41'5	49'2	45'3	32	27th, 28th	56	22nd, 29th	2'36	36	15
PARSONSTOWN - - -	*	*	*	*	*	*	*	*	24	10
VALENCIA - - -	*	*	*	*	*	*	*	*	18	7
POYNES - - -	39'7	51'2	45'4	29	27th	55	2nd, 30th	4'14	—	—

* Information to be found in Table I.

MONTHLY WIND CHART FOR JANUARY 1884.

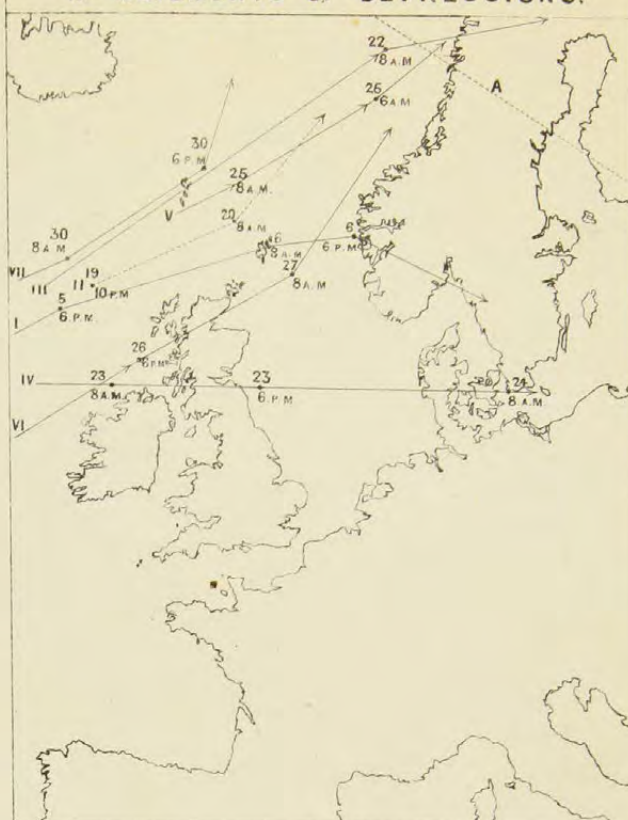
Plate I.



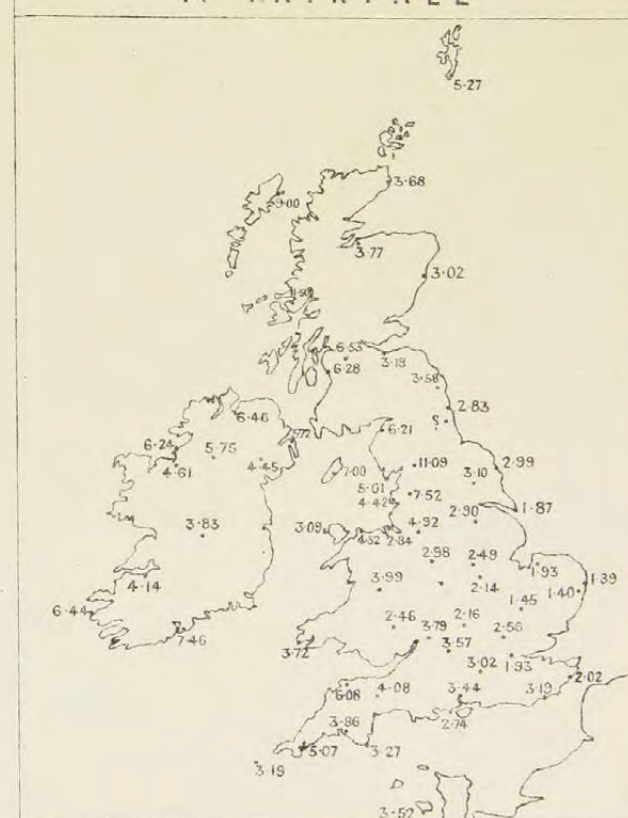
To face p. 12.

DANCERFIELD, LITH. 22 BEDFORD ST. COVENT GARDEN. 7493

2. MOVEMENTS OF DEPRESSIONS.

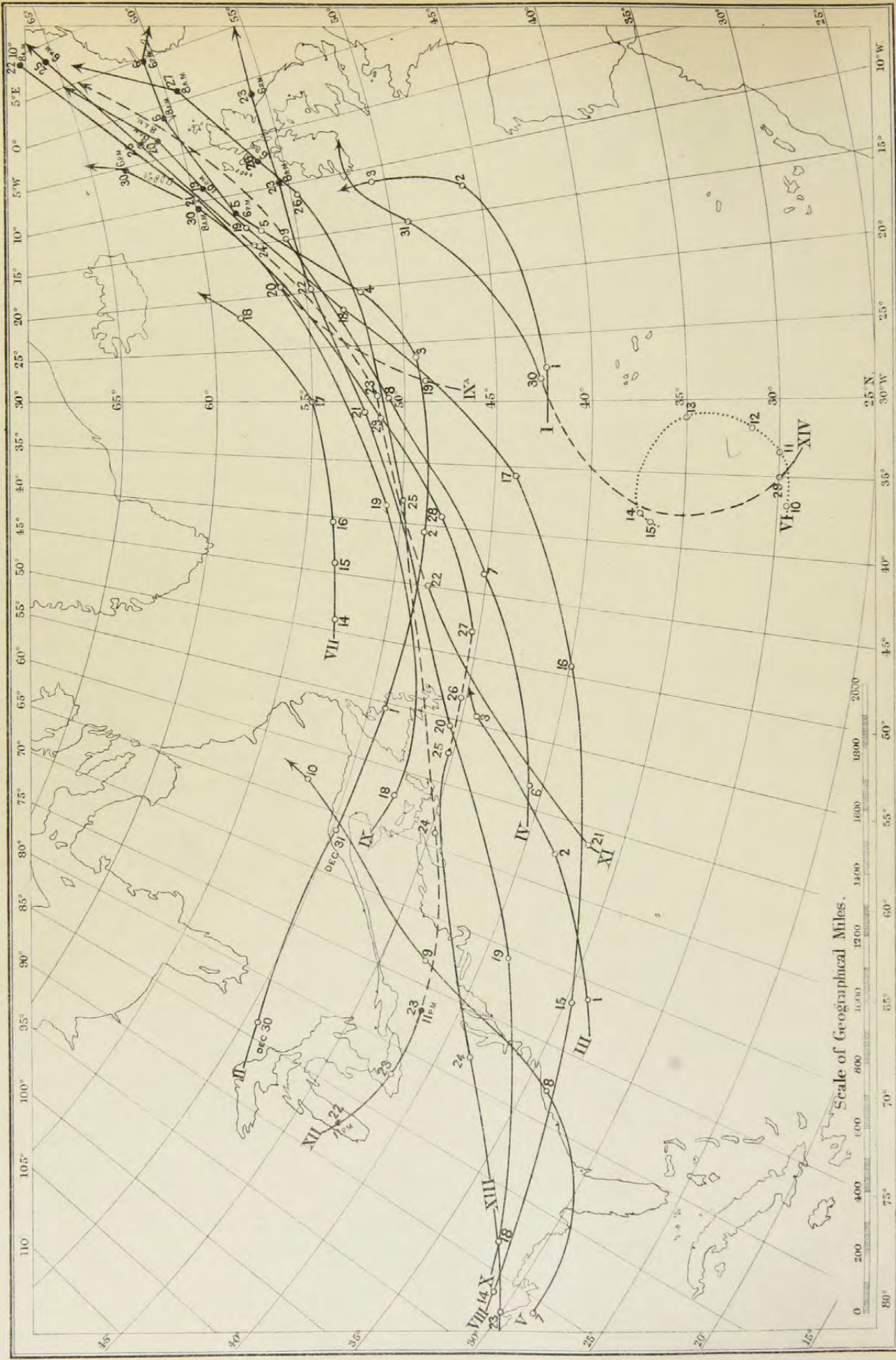


4. RAINFALL



STORM-TRACKS FOR JANUARY, 1884.

Plate III.



The Roman numerals show the several storm-tracks which occurred during the month.

The ordinary figures give the days of the month at the local non positions of the respective storms.

A broken line indicates doubt, and a dotted line greater uncertainty.

STORM TRACKS FOR JANUARY 1884.

THE month was very stormy over the North Atlantic as well as over the British Islands; there was not a single day throughout the period on which a gale was not blowing in some part of the ocean between Europe and America, and on many days winds of gale force were experienced over the whole of the route followed by trans-Atlantic steamers. On several days two distinct storms, and on at least two days as many as three, were blowing simultaneously. The Track Chart, Plate III., shows that on the 2nd storm-centres were situated in 46° N. 13° W.; in 48° N. $40^{\circ} 30'$ W.; and in 38° N. $62^{\circ} 30'$ W.; a fourth disturbance evidently existed somewhere in the West Indies, for a strong gale was blowing in their vicinity, as well as in the Gulf of Mexico, it is not, however, possible at present to fix the position of the centre of this storm, and consequently it cannot be shown on the Chart. On the 15th storm-centres were situated in 37° N. 38° W.; in 53° N. 44° W.; and in 35° N. 72° W.

The commencement of the month was very stormy on the western side of the Atlantic, whilst the weather was comparatively quiet on the European side; towards the close of the month there was a complete reversal of these conditions, for storms were exceptionally frequent on the European side, but fairly quiet weather was experienced over the United States and the Western Atlantic.

The following are a few details with respect to the several storm-centres which can be traced during the month. The Roman numerals correspond to the numbering on the Track Chart, Plate III. In all 14 separate storm-centres can be tracked either across the North Atlantic, or for a considerable distance over that ocean. The movement of those which passed over the British Islands will be found in Diagram 2, Plate II., and an analysis of them is given in the Table of Cyclonic Systems, pp. 4 and 5.

I. Probably this storm was blowing in the Atlantic at the close of December, for on January 1st it covered a very large area, occupying the whole of the central part of the North Atlantic, the diameter measuring fully 1,500 miles; the wind attained the force of a gale on all sides of the storm-centre, which was in 42° N. $27^{\circ} 30'$ W. This storm travelled east-north-eastwards until the 2nd, but afterwards followed a track almost due north, and passed to the westward of the British Islands. The weather reports of the 3rd, however, show distinct evidence of the existence of a disturbance out in the Atlantic.

II. The United States War Department Weather Maps show an area of low pressure near Lake Superior on December 30th which crossed the Gulf of St. Lawrence on the 31st, and was situated on the North Coast of Newfoundland on January 1st; it travelled nearly due east at a fairly uniform rate of 550 miles per day until the 3rd, when it was in 49° N. 26° W.; it afterwards took a course to the north-eastwards, and its rate of travelling became very much slower. Probably its progress to the eastward was checked by the anticyclone which prevailed over Western Europe. This storm passed to the North of Scotland on the night of the 5th to 6th, and is the same depression as that numbered I. on Diagram 2, Plate II. In its passage across the Atlantic the rear of the storm appears to have had the strongest winds.

III. The first evidence of this storm is obtained from the United States Weather Maps, which show a depression on the 1st slightly to the eastward of Charleston. It travelled to the north-eastward at the rate of about 500 miles a day until the 3rd, when the centre was not far from the south-eastern extremity of Newfoundland; it cannot, however, be traced subsequently.

IV. This was first shown in 41° N. 58° W. on the 6th, it travelled at a fairly uniform rate of about 650 miles per day in a north-easterly direction until the 9th, when it was in 56° N. 15° W., and the weather in the British Islands on this day was under the influence of the depression as it passed to the westward of our coasts. This gale was one of considerable

dimensions. On the 8th the diameter of the southern half of the disturbance was about 1,500 miles, winds blowing with gale force almost from coast to coast between Newfoundland and Ireland.

V. This disturbance was first shown in the Northern part of the Gulf of Mexico on the 7th, and after skirting the east coast of North America on the 8th and 9th, was lost sight of over Labrador on the 10th. It was exceptional in having followed such a Northerly track.

VI. The path followed by this storm was very unusual. It was first shown on the 10th in 29° N. 37° W., and after travelling very slowly in a north-easterly direction until the 13th, it recurved and travelled to the north-westward and subsequently to the south-westward, it cannot be followed after the 15th. Although this track is dotted as indicating doubt, yet the evidence is from several vessels, and the storm appears to have been about 1,000 miles in diameter.

VII. The first evidence of this depression was in 53° N. 49° W. on the 14th. It travelled very slowly, only about 150 miles per day, until the 16th, but it afterwards increased its rate to about 400 miles per day; it cannot be traced after the 18th, and it was then too far to the north-west of our islands to materially affect our weather.

VIII. This was first shown by the United States Weather Maps on the 14th over Texas. It travelled at the rate of about 1,000 miles per day and had entered the Atlantic on the 15th. Its rapid rate of progress was continued on the 16th, but afterwards it decreased to about 700 miles per day, and its course became more northerly. This storm passed to the north of Scotland on the night of the 19th to 20th, and is the same as that numbered II. in Diagram 2, Plate II. It appears to have developed energy as it crossed the Atlantic.

IX. The American Daily Weather Charts first show this disturbance near the Gulf of Saint Lawrence on the 18th; it travelled east-north-eastwards at the rate of about 900 miles per day until the 20th, when it seems probable that it was joined by the disturbance IXA., which was situated in 47° N. 29° W. on the 19th. Neither of these gales appear to have been of a large area, and after they merged the storm travelled in a north-easterly direction and passed to the North of Scotland on the 21st. It corresponds with the depression numbered III. on Diagram 2, Plate II.

X. The American Weather Maps first show this storm-centre over Texas on the 18th, and it enters the Atlantic on the 19th. Its rate of travelling averaged about 900 miles per day until the 21st, its course being about east-north-east, afterwards its rate was only about half as great, and its course became nearly due east. It crossed Scotland on the 23rd, and it is the same storm as that numbered IV. on Diagram 2, Plate II.

XI. This storm was first shown in 37° N. 61° W. on the 21st. It travelled about 950 miles to the north-east between the 21st and 22nd. Its subsequent track is not well supported, but it would seem to be the same storm as that which passed to the north of Scotland on the 24th to 25th, and which is numbered V. on Diagram 2, Plate II.

XII. The United States Weather Maps show an area of low barometer readings over Lake Michigan at 11 p.m. 22nd, and this depression travelled eastwards over America on the 23rd; there is, however, no evidence of the position of the centre on the 24th, so that the connexion between the gales of the 23rd and 25th is a matter of doubt; it will be seen, however, that the rate of motion from the 25th to 26th supports the track given. This storm travelled in an east-north-easterly direction, and is probably the same as the very violent storm which blew in the British Islands on the 26th and 27th, and which is numbered VI. on Diagram 2, Plate II.

XIII. This storm commenced on the morning of the 23rd, in the extreme north-western corner of the Gulf of Mexico, whence it travelled to the north-eastward over the United States and Nova Scotia. Its position on the 26th is not shown, but on the 27th a centre of disturbance is shown to the south-eastwards of Newfoundland, in 46° N. 48° W., which was probably the same. It subsequently travelled to the north-eastwards and passed to the North of Scotland on the 30th. This storm is numbered VII. in Diagram 2, Plate II.

XIV. On the 29th there was a storm in 30° N. 35° W., which was probably due to the same area of low pressure as that shown in 43° N. 28° W. on the 30th, and which crossed the South of Ireland on February 1st, and the English Channel on February 2nd. This depression will be shown as number I. on Diagram 2 of the Monthly Weather Chart for February.

These tracks have been laid down from such observations only as had reached the Meteorological Office prior to the 20th of February. It is possible that a larger number of observations, which might have been obtained by a longer delay, or by a special effort to collect materials, might have slightly modified some of the tracks, but the map, Plate III., may be held to give a fair approximation to the distribution of the storm tracks over the North Atlantic during the month.

It is not proposed by the Council to continue the issue of such Atlantic "storm tracks." The present is merely a specimen of what might be printed if the time necessary for its preparation were available.

MONTHLY WEATHER REPORT.

FEBRUARY 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather experienced during the month of February was on the whole quiet and mild for the time of year, the winds reported were light or moderate in force, and temperature slightly in excess of the mean. The distribution of pressure was favourable for the prevalence of winds from between S.E. and S.W., and, as the direction of those actually experienced alternated between these points the temperature varied somewhat—being lowest with the South-easterly and highest with the South-westerly current. No great extreme of heat or cold was recorded, so that the total range was small, but a sudden and singular fall of the thermometer took place on the 10th during the prevalence of a gale from the South-westward, and the change was accompanied by a considerable fall of snow in Ireland, and a smaller quantity in many other places. (*See below.*) The fall of rain during the month was very large over the south-western parts of the kingdom, and rather large in the western and north-western districts generally, but in the east of England the amount recorded was very far short of the normal quantity for February. The proportion of bright sunshine increased steadily each week as the month advanced, but was never very large. (*See Weekly Weather Report, Nos. 5 to 8.*)

February 1-5.—During this interval westerly gradients prevailed generally over the British Islands and their neighbourhood, as will be seen on referring to the charts in the Daily and Weekly Weather Reports for this time. The weather was therefore mild on the whole, but on the 1st and 2nd there was a temporary break caused by the advance of the cyclonic system (No. VIII., p. 20) which produced an interval of winds from N.E. and N. over the British Islands and North Sea, accompanied by a fall of temperature and cold rain. By the 3rd, however, this disturbance had disappeared, an anticyclone (No. III., p. 22) was formed in the south-west, and after moving eastwards to France, spread northward over the British Islands and the German Ocean, while the barometer remained lowest in the north. On the 3rd a large and apparently well formed depression appeared off the west of Norway and moved slowly in about a north-easterly direction. Its centre was at too great a distance from our islands for the system to exert any great influence on our winds or weather, and its distance from the Scotch and Norwegian coasts too great for its movements to be shown on Map 2, Plate V. Another centre appeared near Christiansund on the 6th, but the system either dispersed in that neighbourhood or travelled away quickly to the northward.

February 6-8.—The anticyclonic system over France was now increasing considerably in size and spread northwards over the southern part of the British Islands and North Sea. A very small and shallow depression appeared in the south-west on the 6th, and travelling slowly to the eastward reached the neighbourhood of Lorient early on the 7th, and at the same time a new (but small) anticyclonic system showed itself for a few hours off the west of Ireland, so that although Westerly breezes still prevailed in most places, a light Easterly current was felt temporarily over the southern parts of England and Ireland. Temperature fell decidedly, especially in the east and north; but both the small depression and the new anticyclone dispersed quickly, and on the 8th the large anticyclone in the south-east spread more completely over the United Kingdom.

February 9-14.—The type of weather during this interval was Southerly to South-westerly, and as pressure gave way rapidly at the Western stations the gradients soon became steep, the wind freshened, and temperature rose. Late on the 8th, and again on the 9th-10th large depressions appeared to be passing outside our extreme West and North-west coasts, the first moving in a northerly and the second in a north-easterly direction. The effect of the former was confined almost exclusively to the most westerly parts of the Kingdom, but the latter produced Southerly and South-westerly gales of great strength at nearly all our stations (*see* Cyclonic System No. IX., p. 20). Temperature at first rose considerably, rain fell in the West, and a thunderstorm occurred in the South-west of Ireland. On the 10th, however, a remarkable change occurred; for although the wind did not veer to the westward of W.S.W. anywhere, and in many places continued to blow steadily from S.S.W. or S.W., the thermometer fell rapidly, and showers of snow, sleet, and hail were experienced very generally in the west and south: even in London wet snow fell on the morning of the 19th, and a sharp thunderstorm passed over about 11.30 a.m. (*see* The Daily Weather Reports for the 10th and 11th). This sudden fall of temperature, with its accompaniment of snow, sleet, and hail is very curious, for as the wind remained steadily to the Southward of W., and was strong in force, neither the temperature of the ocean surface, whence the wind came, nor any influence of the land over which it was passing appears to have been competent to produce such peculiarities. Even if there had been great nocturnal radiation, the velocity of the wind at the time would preclude the idea of any great effect being produced thereby on the air temperature; but, as a fact, a good deal of snow fell in Ireland during the night, and consequently such radiation could scarcely have occurred. On February 12th (pressure being then high over France, Germany, and South-eastern Europe) another depression approached the West of Ireland from the Atlantic. Southerly gales and much rain again set in on our Western Coasts, and temperature rose quickly in the East and South; the weather, however, was fair, and mild generally. The Continental high pressure area continued to increase both in size and intensity, and spread Northwards over the Baltic and Scandinavia, so that the depression could not advance over our islands, but passed Northwards (if not North-north-westward), and the gale lulled while the barometer rose generally.

February 15-18.—This was a period in which the type of weather and of pressure-distribution was South-easterly. It was brought about by the continual Northerly movement of the continental high pressure area referred to in the last paragraph, and the formation of a subsidiary anticyclone (No. IV. p. 22) over Scandinavia, accompanied by some reduction in pressure to the South-westward of our islands and over the Bay of Biscay. Temperature fell as the change took place, and for a time the air became rather cold over the eastern and midland parts of England. The great strength of the South-easterly winds at our western and northern stations on the 15th and the general trend of the isobars over our western districts appear to indicate the existence of large areas of low pressure over the Atlantic, one of which lay far away to the south-westward of Cape Clear. The distance of its centre from our Islands was, nevertheless, far too great for its position to be marked, even approximately, on Map 2, Plate VI., but its motion was apparently Northerly and slow. As it advanced the wind began to veer again with a rising temperature, and a gradual encroachment of rainy weather from the Atlantic as the European anticyclone moved slowly southwards, and the 19th found us with Southerly breezes blowing all over the kingdom, and exhibiting a tendency to veer to the South-westward.

February 19-22.—During this period the relative distribution of pressure altered slowly, the gradients being first southerly and then south-westerly. The highest pressures lay over Germany, Austria, and Switzerland, but the northern part of the high-pressure area still stretched northwards as a "ridge" over Scandinavia and the Baltic, while the lowest pressures lay to the westward of Ireland; the gradients were moderate. The weather had again become very mild generally, and was fine and bright. On the evening of the 20th a small depression (No. X.) advanced rapidly over Ireland from the southward, and travelling very quickly to the northward had passed the Hebrides by 8 a.m. on the 21st, whence it disappeared in a

northerly direction. The disturbance, though small, was apparently deep; for the observer at Roche's Point reports that the barometer, which at 6 p.m. on the 20th stood at 29·12 ins. fell to 28·80 ins. by 10.10 p.m., and rose again to 29·18 ins. by 11.30 p.m. It is probable that the reading at 10.10 p.m. was almost the lowest point reached, as the wind, which had blown a strong gale from S.S.W. between 5 p.m. and 10 p.m., veered to N.W. in a heavy squall at 10.30 p.m. and the barometer then rose quickly. The effect of so deep a depression acting as subsidiary to a still larger disturbance in the far west, was very decided; severe Southerly gales were felt on nearly all our western and northern coasts during the night of the 20th-21st, and at Holyhead 88 miles of wind passed over the anemometer from S.S.E. between midnight and 1 a.m. As the disturbance passed off pressure recovered rapidly on our north-western coasts, but continued to give way slowly elsewhere.

February 23-25.—The distribution of pressure now became more complicated, the readings being relatively high both over northern and southern Europe (see the Charts in the Daily and Weekly Weather Reports for this time). South-easterly winds consequently prevailed over Scandinavia, Southerly and South-westerly over our Islands, and Southerly to Westerly in France. Temperature was rather low except in the south and south-west, and the weather became showery generally. At 8 a.m. on the 23rd the depression No. XI. lay near Denmark, while the cyclonic system No. XII. was advancing towards our north-western coasts. The behaviour of these disturbances was very different to that noticed with Nos. VIII. and VIIIA. on the 1st and 2nd of the month (*see* p. 16.); for as the new depression (No. XII.) advanced to the Eastward it completely absorbed the older one (No. XI.), and continuing its easterly movement travelled away from our area, leaving us with a rising barometer, falling temperature, lulling North-westerly to Northerly winds, and fine weather.

February 26-29.—The recovery of pressure in the rear of depression No. XI. resulted in the formation of a new anticyclone (No. V.), to the northward of our islands and its advance in an easterly direction to Scandinavia. Pressure immediately gave way somewhat over our south-western counties, the Bay of Biscay, and France, and gradients for South-easterly to Easterly winds were thus again established over the United Kingdom, and winds from those quarters set in (*see* the Weekly Weather Report, 1884, No. 9). These conditions continued till the end of the month. Temperature fell generally, and cold showers were reported at times in many parts of the country. At the close of the month a bright display of aurora was reported from our northern stations.

SECTION II.

TABLE OF CYCLONIC SYSTEMS, FEBRUARY, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. VIII. February 1-2.	No. IX. February 9-11.
Form - - - - -	Nearly circular at first, then becoming irregular -	Unknown; portion visible approaching to circular
Size - - - - -	Varying; small to moderate - - - -	Very large - - - - -
Depth - - - - -	Moderate; gradients rather steep - - -	Apparently very deep; readings near centre very low.
Where first Observed - -	Over the South of Ireland - - - -	To the westward of our Islands - - -
Direction of Motion - - -	Easterly, and then South-easterly - -	North-easterly and North-north-easterly -
Rate of Motion - - - - -	Slow - - - - -	Slow - - - - -
Regions passed over by Steepest Gradients	Southern and Western parts of our Islands, the Channel and north of France.	Northern and western parts of the United Kingdom.
Termination - - - - -	Dispersed over Belgium or the north-east of France -	Travelled away to the Northward - - -
Time under Observation - -	About 36 hours - - - - -	About 2 days - - - - -
Accompanying Winds - - -	At first South-westerly gales in South and South-easterly to Easterly winds in North. Wind subsequently drawing into N. and blowing hard very generally.	Southerly and South-westerly gales, strongest in the north and north-west.
" Weather - - - - -	Squally and rainy; cold in the North, but mild in the south. Becoming cold generally later on as centre moved Eastwards.	Mild, squally, and showery at first, then very keen and cold, with snow squalls and some thunder.
" Rainfall - - - - -	Very general; heavy in some localities, especially in the north of England.	General, but not heavy, except in the west, where the fall of snow was very decided.
REMARKS - - - - -	This depression appeared when pressure was highest (30.3+) over Southern and South-eastern Europe, whence a ridge extended northwards over the Baltic and Gulf of Bothnia. Its behaviour was remarkable; at first there was a shallow subsidiary disturbance to the Eastward of it, viz., over the west of Denmark. As time went on, however, the subsidiary disturbance developed into one of primary importance, while the primary became the subsidiary. The former moved in the direction marked VIIa. on Map 2. and 8 a.m. of 2nd, found it between Riga and Revel, as a well-formed depression, while the latter was dispersing near Boulogne. The recovery of pressure in its rear was unusually large, amounting to 1.3 ins. over the south of Ireland in the 24 hours ending at 8 a.m. on the 2nd.	This depression came on when pressure was highest over the Mediterranean and South-eastern Europe. The changes in temperature which accompanied it were large and somewhat peculiar; they are more fully referred to on p. 18.

SECTION II.

TABLE OF CYCLONIC SYSTEMS, FEBRUARY, 1884.

No. X. February 20-21.	No. XI. February 22-23.	No. XII. February 23-25.
Nearly circular - - - - -	Nearly circular - - - - -	Nearly oval.
Apparently very small - - - - -	Small - - - - -	Moderate.
Not exactly known - - - - -	Shallow - - - - -	Shallow.
Over the south of Ireland - - - - -	Over the north-west of France - - - - -	Off the North-west coast of Ireland.
Northerly - - - - -	North-easterly - - - - -	Generally Easterly, but varying somewhat.
Rapid - - - - -	Rapid - - - - -	Moderate, but varying.
Western and North-western parts of our Islands -	The North of France and the Netherlands -	Ireland, England, and the North Sea.
Travelled away Northwards towards the Faro Islands.	Dispersed over south of Norway - - - - -	Travelled away over the Baltic, and apparently dispersed near Riga on the 26th.
About 18 hours - - - - -	1 day - - - - -	3 days.
Very severe Southerly gales on our west and north-west coasts.	Varying greatly; not very heavy. Cyclonic circulation complete.	Calms and Easterly and North-easterly breezes in the North. Strong S.W. to N.W. over England, Ireland, and the English Channel.
Mild and cloudy; much rain in Ireland - - -	Very changeable; mild and wet at first, then cold and clear.	Showery generally; mild at first, but becoming colder in the N. after centre reached the North Sea.
Heavy in the west and north-west, not much elsewhere.	Greatest over France, but not very heavy. Amounts less than 0.5 ins.	General, but slight.
The arrival of this depression was extremely sudden. The gradients were Southerly, and at 2 p.m., though the barometer was then falling in the West, there was nothing to indicate that the centre would come in to the Eastward of Valencia, nor that the disturbance would be nearly so serious as it proved to be. At Holyhead the wind velocity was 88 miles between midnight of the 20th and 1 a.m. on the 21st. See also notes on pp. 18 and 19.	This depression advanced first when pressure was (relatively) high both over southern and northern Europe, but low to the north-westward of our Islands, the gradients being slight. Its effect in lowering temperature over England was decided, and the changes in the wind on our South-eastern coasts were very large. The system, however, dispersed on the approach of No. XII.	When this depression first appeared pressure was highest over southern Europe and the Mediterranean, but was somewhat high over the northern Europe and Russia also. On its passing to the Eastward of our Islands it broke up (or absorbed) Cyclone No. XI., together with another shallow depression which appeared near Skudenesnes on the evening of the 23rd.

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS, FEBRUARY, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. III. February 3-5.	No. IV. February 14-18.	No. V. February 26-29.
Form - - - - -	Somewhat oval - - - - -	Very variable, but at times approaching to oval.	Uncertain; apparently variable.
Size - - - - -	Large - - - - -	Small to large - - - - -	Large.
Height - - - - -	Moderate - - - - -	Moderate to great - - - - -	Moderate.
Where first Observed - - -	Over the Bay of Biscay - - -	Over Scandinavia - - - - -	To northward of the British Islands.
Direction of Motion - - -	Easterly - - - - -	South-south-easterly - - - - -	Easterly and south-easterly.
Rate of Motion - - - - -	Slow - - - - -	Very slow - - - - -	Slow.
Regions passed over - - -	Bay of Biscay and France - - -	Scandinavia, the Baltic and North Germany.	Scandinavia.
Termination - - - - -	Developed into a very large high pressure area over Germany.	Developed into a large high pressure area over Germany.	Developed into a very large high pressure area over Russia.
Accompanying Wind - - -	Westerly in our Islands, Northerly to Easterly over France.	South-easterly over our Islands, blowing hard in Scotland; Easterly on the eastern shores of the North Sea.	South-easterly over our Islands.
Weather - - - - -	Fine, but rather cold, some haze locally.	Rather cold; dry at our Eastern stations and over the North Sea.	Fair on the whole and rather cold. Some cold showers over the United Kingdom.
REMARKS - - - - -	<p>Although the temperatures within the area of this anticyclone were somewhat lower than those outside its limits, they were not nearly so low as those recorded under similar conditions a few years ago.</p> <p>This anticyclone was formed in an arm which stretched over Scandinavia from a larger anticyclonic system, the centre of which lay over Northern Russia on the 14th. The barometer then fell over Russia and this system formed an independent anticyclone which covered the whole of Germany by the 19th.</p> <p>The weather over our Islands during this system was not very cold for the time of year. On the 29th, however, the cold became severe in the north of Sweden.</p>		

SECTION III.

REMARKS FOR FEBRUARY 1884.

(Tables III. and IV. with Plates IV. and V.)

Pressure.—The mean (8 a.m.) pressure for the month varied from 29·94 ins. at Dover to 29·63 ins. at Mullaghmore, and to 29·60 ins. at Stornoway, so that the gradients were favourable for Southerly winds of moderate strength. These figures, when compared with the means for the 20 years 1861—80, show that the pressure for the month was below its normal value everywhere, the deficit being as much as 0·22 in. at Valencia and 0·14 in. in the Hebrides, while it was only about 0·05 in. on our extreme south-eastern coasts. The highest readings were recorded at our southern stations on the 4th, at which time the anticyclone No. III. lay over France, but at the northern stations the highest were recorded on the 15th, *i.e.*, while anticyclone No. IV. was lying over Scandinavia. The lowest readings were registered on the 10th, in the north and north-west, during the progress of cyclone No. IX., and on the 1st in the extreme south-west and south, during the progress of No. VIII. The range, however, was not large anywhere, as no very high nor very low reading was registered.

Movements of Depressions.—These are shown on Map 2, Plate V., and their directions vary from north to east-south-east. Between these limits their movements varied so much that they appear to obey no general law. One of the depressions (No. VIIIA.) seems to have been formed within our area, and to have grown deeper as it moved away to the Baltic; while two others (Nos. VIII. and XI.) after reaching our shores as well-formed systems, soon dispersed, one near Belgium and the other over the south of Norway.

Anticyclones.—These were four in number. Two of them lay chiefly over Scandinavia and one over France, while the fourth (which was too small and temporary to be included in the table given on p. 18) appeared off our western coasts on the morning of the 7th, but disappeared again before the evening of the same day. They presented no features worthy of special remark, except that the temperatures within their area were not nearly so low as those observed in similar systems at this season during some recent years.

Winds.—The winds were chiefly South-easterly to South-westerly over our south-western and north-eastern districts, Southerly to South-westerly in the East, Southerly to South-easterly in the Shetland, Hebrides, and North of Ireland; in the south-west of Scotland however there was a large percentage of wind from the North-eastward and Eastward. This prevalence of Easterly and North-easterly winds in the south-west of Scotland at a time when Southerly and South-easterly winds prevailed on nearly all other parts of our Western Coasts is a phenomenon worthy of remark from the frequency with which it occurs. A similar coincidence is often found in a modified form on the north-western coasts of England, as may be seen by examining the observations at Barrow-in-Furness and at the Bidston Observatory under such conditions. In force the winds have been generally moderate, but, as usual, were stronger over the western than over the eastern parts of the kingdom. The gales reported were much more numerous in the West than in the East, and on some occasions (*e.g.* on the 9th and 20th), their force was very considerable. In the east and south-east, however, they were moderate. The order in which the winds from the different quarters were prevalent will be found in the general summary on pp. 17 to 19.

Temperature.—The mean (sea level) temperature of the month ranged from a little above 46° on our extreme south-western coasts, to a little below 42° both over the north of Ireland and the eastern counties of England, and to somewhat below 40° over the inland part of Scotland. These values compared with the averages for the corresponding month in the 20 years, 1861—80, show a slight excess in almost all districts, and a somewhat decided excess over the extreme southern counties of England. The relative distribution of temperature is almost precisely that of the average for this season of the year, and the agreement would

probably be still more evident were more information available from the south-west of Scotland. The coldest morning was that of the 3rd in almost all places, but sharp weather was again experienced in the northern parts of the kingdom on the 29th. The highest values were recorded at very various dates, the greater number of the Scotch stations giving the maximum on the 4th, while at many of the English stations, the 9th was the warmest day. The highest readings recorded, however, were 57° in London, 56° at Cambridge, and 55° at Loughborough, and these all occurred on the 13th.

Vapour Tension.—This was comparatively uniformly distributed, the mean values varying from a little below 0·20 in. over the inland parts of Scotland, and about 0·21 in. over the midland parts of England, 0·22 in. over the inland parts of Ireland, to about 0·24 in. over the Irish Sea, and to 0·28 in. off our extreme south-western coasts. The differences between the vapour tension values at the inland stations and at those on the coast is almost as strongly marked as are the differences of temperature. *Relative Humidity* was less regularly distributed, but, on the whole, was lowest at the inland stations. The lowest values of all (85 per cent.) were those at Nairn, Liverpool, and Holyhead, while the highest were found over the eastern counties and on our extreme north-western coasts. The values for the inland parts of Ireland and England were very uniform between 87 and 89 per cent. The humidity recorded at Ardrossan was so high that a query has been placed to its value in Table III., p. 27.

Rainfall.—The fall of rain registered at the stations named in Tables III. and IV. varied from between 0·6 in. and 0·8 in. over our eastern counties to nearly 5 inches at Glasgow, Ardrossan and Pembroke, to 6 inches at Douglas (Isle of Man) and to all but 9·5 inches at Valencia. At Laudale (Loch Sunart) 11·5 inches were measured. At our eastern stations the fall was very much less than the average, while at the south-western stations it was largely in excess; this appears to be what we might naturally look for, when we consider how many of the cyclonic disturbances passed over or near to our western and south-western coasts, while of the two which passed over the south-eastern districts one had almost dispersed before it reached that locality. To this must be added the fact that even when there was no definite depression passing over any part of the country, the distribution of pressure was almost constantly cyclonic in the west and south-west, and anticyclonic in the east.

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS

MADE AT

TELEGRAPHIC REPORTING STATIONS IN THE BRITISH ISLANDS,

DURING THE MONTH OF FEBRUARY 1884.

TABLE III.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
Observations are made at 8 a.m. daily, but the Numbers of Days of Rain, Snow, Hail,
(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 33° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head	ins. 29°698	40°4	35°5	43°5	39°5	27	2nd	48	4th
	Wick	29°697	39°5	34°9	43°9	39°4	30	2nd, 3rd, 24th, 25th.	49	3rd, 4th, 12th, 14th.
	Stornoway	29°598	40°2	35°3	45°4	40°4	28	2nd	50	4th, 18th
1. SCOTLAND, E.	Nairn	29°678	38°4	34°8	45°3	40°1	26	29th	53	9th
	Aberdeen	29°749	39°5	35°9	44°5	40°2	27	8th	53	4th
	Leith	29°743	40°0	36°2	46°6	41°4	26	29th	54	9th
2. ENGLAND, N.E.	Shields	29°803	41°0	37°3	45°0	41°2	29	3rd	51	4th, 5th, 6th, 12th, 13th, 15th
	York	29°853	39°7	36°2	46°4	41°3	29	3rd, 29th	53	
	Spurn Head	29°852	40°3	37°0	44°5	40°8	32	3rd	49	5th, 9th, 14th, 20th, 22nd.
3. ENGLAND, E.	Yarmouth	29°919	40°7	37°3	44°7	41°0	30	3rd	52	20th
	Cambridge	29°912	39°6	35°0	48°1	41°6	28	3rd, 4th, 29th	56	13th
4. MIDLAND COUNTIES	Loughborough	29°869	39°2	36°4	47°4	41°9	28	29th	55	13th, 14th
	Oxford	29°902	40°1	37°6	47°2	42°4	29	3rd, 29th	54	13th
5. ENGLAND, S.	London	29°927	40°7	37°7	48°1	42°9	28	3rd	57	13th
	Dover	29°942	42°3	39°7	46°4	43°1	33	3rd, 4th	50	13th, 14th, 24th
	Hurst Castle	29°902	43°3	39°8	48°4	44°1	28	3rd	54	14th
6. SCOTLAND, W.	Ardrossan	29°724	40°3	36°6	44°6	40°6	30	26th, 29th	49	3rd
7. ENGLAND, N.W.	Hawes Junction*	28°568	35°6	32°2	39°8	36°0	21	3rd	47	9th
	Barrow-in-Furness	29°788	40°5	37°8	44°8	41°3	30	3rd	48	9th, 12th, 13th, 14th, 20th.
	Liverpool	29°857	40°1	37°6	45°6	41°6	30	29th	53	9th
	Holyhead	29°762	42°9	38°4	46°0	42°2	33	3rd, 17th, 29th	50	13th, 14th
8. ENGLAND, S.W.	Pembroke	29°785	44°1	40°8	46°3	43°6	34	3rd	50	9th, 13th, 20th
	Prawle Point	29°872	44°2	39°8	47°7	43°8	30	3rd	53	14th
9. IRELAND, N.	Donaghadee	29°726	41°1	37°1	45°8	41°5	29	8th	52	4th
	Mullaghmore	29°626	42°3	38°3	47°0	42°9	32	11th	52	9th, 12th
10. IRELAND, S.	Parsonstown	29°702	41°1	37°0	47°3	42°2	29	3rd	54	19th
	Valencia	29°670	45°9	41°6	50°3	46°0	34	10th, 11th, 21st	54	24th, 27th
	Roche's Point	29°708	44°7	40°4	49°9	45°2	32	3rd	52	3rd, 4th, 9th, 13th, 19th, 20th.
CHANNEL ISLANDS	Scilly (St. Mary's)	29°791	47°4	43°3	49°9	46°6	34	3rd	54	9th, 18th
	Jersey (Noirmont)	29°917	44°2	41°5	48°1	44°8	35	29th	55	14th

* Hawes Junction is 1,135 feet above Mean Sea Level and the

TABLE III.

REPORTING STATIONS in the BRITISH ISLANDS, during the Month of February 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred.

beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of								WIND, No. of Observations of							
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calms.
ins.	%		ins.	ins.	4th	25	1	0	0	2	13	7	3	2	0	7	9	3	3	2	0
218	87	7.4	2.80	0.36	19th	15	0	0	0	4	12	7	1	0	1	2	15	1	5	4	0
207	86	6.7	0.94	0.16	22nd	22	3	1	0	6	16	9	0	2	2	9	7	5	3	1	0
228	92	6.8	4.48	0.63	10th	10	1	0	0	8	12	3	1	0	3	4	0	6	3	2	10
197	85	5.9	0.99	0.32	13th	20	2	3	0	5	13	6	2	1	0	3	11	7	1	3	1
207	86	6.9	1.90	0.46	1st	14	0	0	0	5	8	3	0	2	1	10	3	7	3	3	0
222	90	6.3	1.19	0.35	1st	17	1	2	0	0	20	8	2	1	0	4	4	10	5	1	2
221	86	8.8	0.86	0.17	1st	16	2	0	0	7	16	0	2	1	4	3	12	3	2	2	0
212	87	7.0	1.99	1.17	1st	13	1	0	0	7	6	8	0	1	3	6	10	5	3	1	0
229	92	5.8	0.85	0.27	14th, 22nd	15	1	0	0	12	4	4	0	1	3	4	7	8	4	1	1
231	91	4.3	0.72	0.16	22nd	12	0	3	1	10	14	0	1	3	5	1	11	6	1	1	0
221	91	5.9	1.04	0.27	1st	13	0	3	0	3	15	8	0	1	5	2	4	8	4	2	3
212	88	7.3	1.18	0.48	21st	12	0	2	0	8	12	2	0	2	6	1	7	9	4	0	0
219	89	6.3	1.29	0.47	1st	13	0	1	1	7	9	2	0	1	2	5	10	4	4	0	3
222	88	5.7	1.10	0.28	10th	19	0	0	0	15	4	1	1	1	3	4	2	9	7	2	0
238	89	3.4	2.14	0.27	11th	20	0	1	1	2	6	6	0	2	5	2	5	7	5	2	1
252	90	6.4	2.42	0.45	17th	22	1	1	1	7	19	9	1	7	4	3	4	4	3	1	2
243	898	7.4	4.72	0.77	9th	24	6	0	0	3	23	1	4	1	5	4	6	5	3	0	1
199	95	8.6	4.93	0.83	17th	20	0	0	0	1	11	5	2	4	3	7	5	6	0	2	0
220	88	7.1	3.14	0.74	1st	18	2	1	0	6	15	0	0	1	5	7	4	8	2	2	0
212	85	7.1	2.14	0.40	1st	23	0	0	0	1	15	2	1	1	1	7	7	7	4	1	0
255	85	7.9	6.00	1.08	12th	24	0	0	0	0	21	7	0	1	4	5	8	6	4	1	0
262	90	8.9	4.86	0.64	22nd	20	0	0	0	5	14	7	1	1	7	2	7	5	5	1	0
259	89	6.8	2.74	0.39	19th	21	0	0	0	6	10	6	2	1	2	4	5	4	8	3	0
234	91	5.8	4.72	0.82	20th	23	3	4	2	4	12	10	1	1	3	8	5	9	1	1	0
240	89	7.4	4.13	0.96	20th	20	1	0	0	2	21	0	0	1	0	6	12	2	5	2	1
226	88	8.4	3.11	0.61	20th	28	1	3	2	0	17	8	1	2	3	6	3	8	3	1	2
275	90	8.7	9.45	1.37	12th	26	1	2	0	1	21	8	1	1	0	8	4	8	6	1	0
264	89	8.4	8.34	0.90	13th	20	0	0	0	0	13	7	2	0	3	4	8	6	4	2	0
282	87	8.1	3.16	0.42	16th	19	0	2	0	6	10	6	0	1	4	7	4	8	3	2	0
267	92	6.5	2.54	0.40																	

Barometric observations at this station are not corrected for altitude.

TABLE IV.

OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of February 1884.

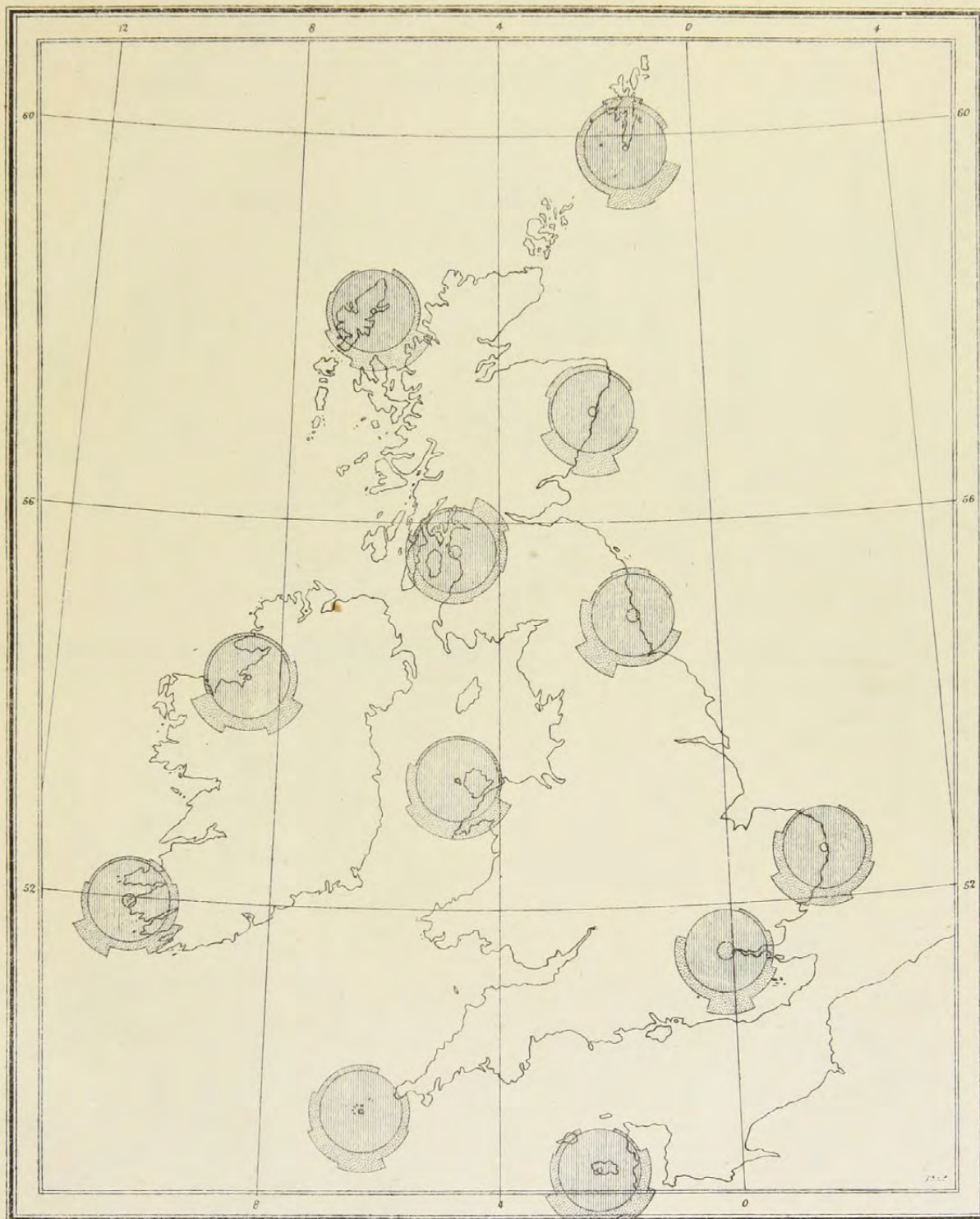
STATIONS.	TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per-centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Minim.	Date.	Maxim.	Date.			
STORNOWAY - - -	*	*	*	*	*	*	*	*	73	27
JERSEY - - -	*	*	*	*	*	*	*	*	86	30
ABERDEEN - - -	*	*	*	*	*	*	*	*	60	22
ALNWICK CASTLE - -	35°3	43°7	39°5	24	28th	50	4th, 13th	1'26	—	—
DURHAM - - -	†	†	†	†	†	†	†	†	†	*
SCARBOROUGH - - -	37°5	45°4	41°5	30	3rd	53	4th, 13th	1'75	—	—
YORK - - -	*	*	*	*	*	*	*	*	34	12
HILLINGTON - - -	35°3	46°6	41°0	27	28th, 29th	55	13th	0'65	72	26
GELDESTON - - -	37°1	46°1	41°6	28	27th	54	13th, 20th	0'68	69	24
CAMBRIDGE - - -	*	*	*	*	*	*	*	*	65	25
ROTHAMSTED - - -	35°6	46°6	41°1	27	3rd	54	13th	1'42	—	—
BAWTRY - - -	36°0	47°1	41°6	24	29th	54	13th	1'17	—	—
LEICESTER - - -	36°4	47°3	41°9	28	29th	55	13th	0'96	58	21
BIRMINGHAM (Oscott) -	†	†	†	†	†	†	†	†	—	—
CHEADLE - - -	34°4	44°7	39°6	26	29th	51	14th	2'06	—	—
CHURCHSTOKE - - -	35°1	45°3	40°2	24	3rd	53	14th	3'98	46	16
HEREFORD - - -	36°2	47°2	41°7	27	3rd	55	14th	2'36	—	—
CIRENCESTER - - -	35°0	45°6	40°3	26	3rd	50	9th, 13th, 14th, 21st, 22nd.	1'52	? 60	? 21
OXFORD - - -	*	*	*	*	*	*	*	*	62	22
LONDON - - -	*	*	*	*	*	*	*	*	41	14
MARLBOROUGH - - -	36°1	45°7	40°9	26	3rd	52	14th	2'62	56	20
STRAATHFIELD TURGISS -	36°7	48°4	42°6	27	3rd	55	13th	1'90	—	—
HASTINGS - - -	40°1	47°2	43°7	32	3rd	52	13th, 14th	1'73	90	31
SOUTHAMPTON - - -	39°4	48°5	44°0	28	3rd	55	14th	2'51	52	18
LAUDALE - - -	36°7	45°8	41°3	27	3rd	52	4th	11'52	—	—
GLASGOW - - -	36°2	44°1	40°2	30	2nd, 8th, 29th	50	9th, 12th	4'66	38	14
SILLOTH - - -	37°0	45°2	41°1	28	3rd	52	13th, 14th, 20th, 14th	2'89	48	17
DOUGLAS - - -	38°7	45°6	42°2	29	2nd, 3rd	51	14th	4'96	55	20
NEWTON REIGNY - - -	34°4	43°4	38°9	25	3rd	49	4th, 6th, 14th, 21st.	3'85	35	13
STONYHURST - - -	35°3	44°9	40°1	27	3rd	51	13th, 14th	4'47	42	15
BLACKPOOL - - -	36°4	45°1	40°8	27	26th	51	9th, 12th	2'94	48	17
MANCHESTER - - -	35°4	45°4	40°4	26	3rd, 29th	52	13th	2'24	—	—
LLANDUDNO - - -	38°2	46°9	42°6	32	17th, 29th	57	9th	2'95	†	†
PEMBROKE - - -	*	*	*	*	*	*	*	*	41	14
ARLINGTON - - -	36°1	45°8	41°0	25	3rd	51	9th, 14th	4'52	—	—
CULLOMPTON - - -	37°8	47°6	42°7	25	3rd	53	14th	3'71	42	15
FALMOUTH - - -	42°5	48°5	45°5	36	3rd	53	9th	5'23	51	18
PLYMOUTH - - -	40°2	49°2	44°7	29	3rd	54	24th	4'04	39	14
LONDONDERRY - - -	35°8	48°0	41°9	30	22nd, 26th	54	5th	3'82	—	—
MARKREE CASTLE - -	36°3	46°5	41°4	30	7th	52	12th, 19th	2'83	51	18
BROOKEBOROUGH - -	35°4	45°7	40°6	27	26th	52	9th	3'37	—	—
ARMAGH - - -	36°3	45°7	41°0	29	2nd	58	14th	3'51	51	18
DUBLIN - - -	39°2	47°5	43°4	32	2nd, 3rd	55	9th	3'52	49	17
PARSONSTOWN - - -	*	*	*	*	*	*	*	*	57	20
KILKENNY CASTLE - -	38°3	46°7	42°5	28	2nd	55	17th	4'51	—	—
WATERFORD - - -	38°6	47°8	43°2	27	3rd	52	9th, 19th	7'41	—	—
VALENCIA - - -	*	*	*	*	*	*	*	*	61	21
FOYNES - - -	37°6	48°3	43°0	32	10th	53	11th	6'14	—	—

* Information to be found in Table I.

† Records very incomplete.

MONTHLY WIND CHART FOR FEBRUARY 1884.

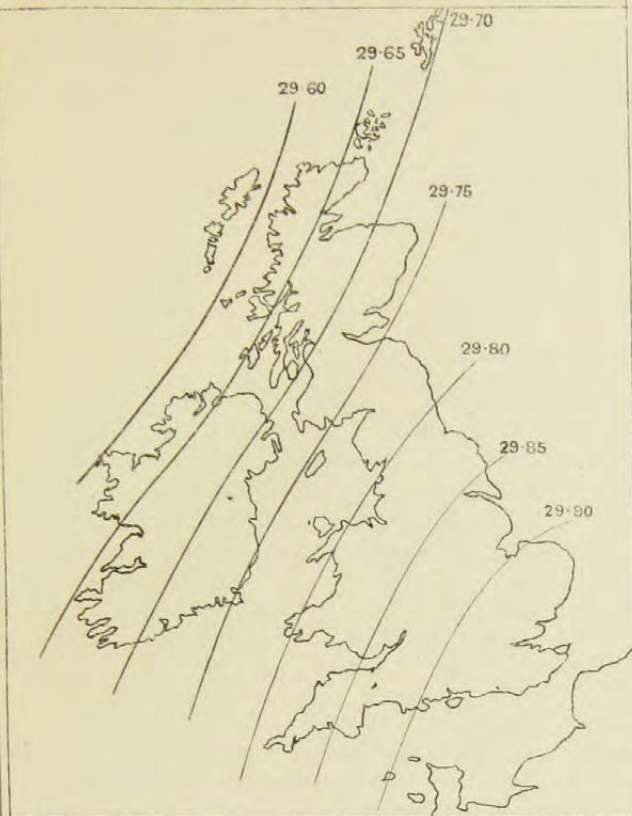
Plate IV.



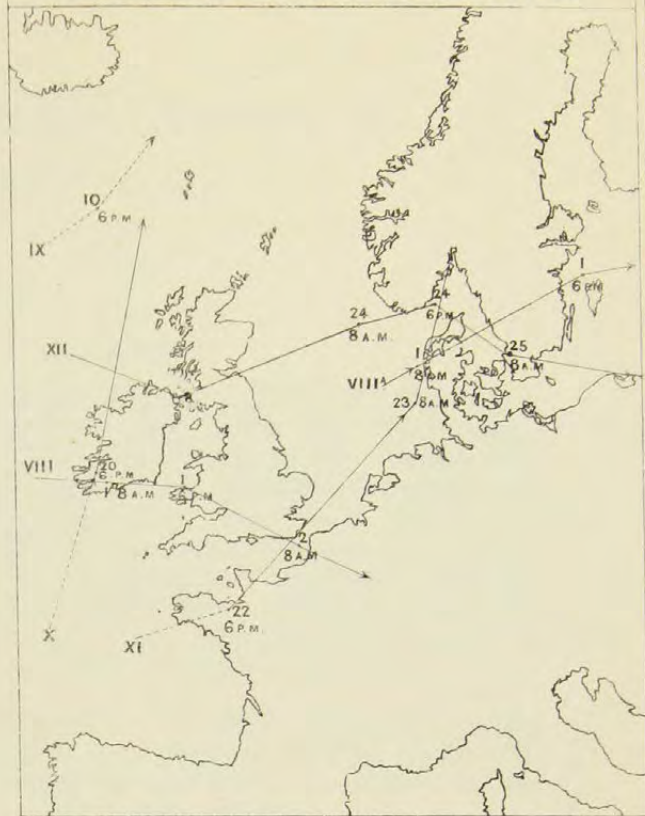
To face p. 28.

DANGERFIELD LITH. 22 BEDFORD ST. COVENT GARDEN W663

1. DISTRIBUTION OF MEAN PRESSURE



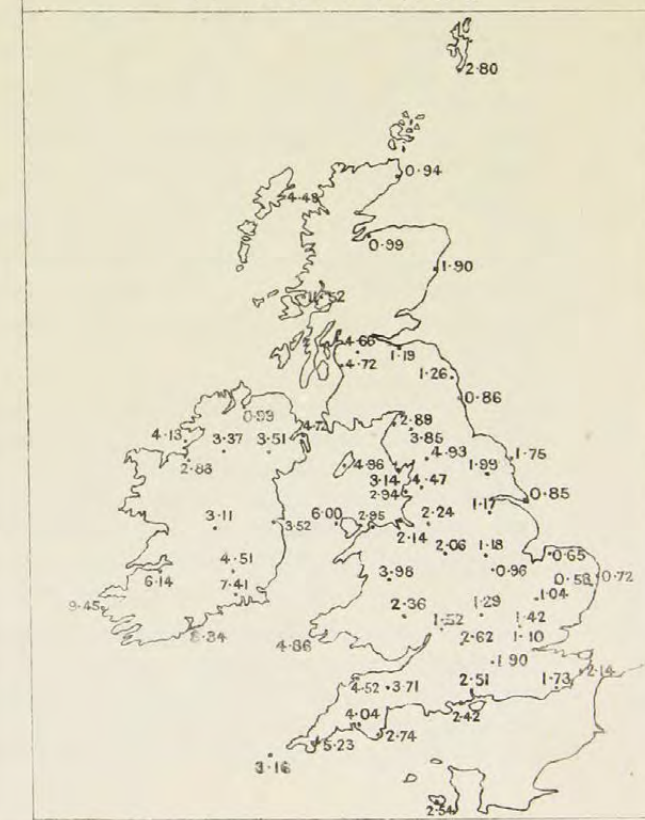
2. MOVEMENTS OF DEPRESSIONS.



3. DISTRIBUTION OF MEAN TEMPERATURE.



4. RAINFALL



MONTHLY WEATHER REPORT.

MARCH 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather experienced over the United Kingdom during the month of March varied considerably from time to time. At one period it was cold, at another exceptionally warm, but on the whole the temperature was a little above the average. Pressure was rather high generally, its range was small, and its distribution was favourable for winds from a more Southerly quarter than is usual in March. The gales were few in number and moderate in force; the rainfall was slight over England, but rather heavy in the western and extreme northern districts, and very heavy in the south-west of Ireland; and the amount of cloud and the number of overcast skies were large. The month did not, however, exhibit those great extremes of temperature and wind which are generally supposed to belong to March, and conditions were on the whole favourable for agricultural work.

March 1-2.—The month opened with cold, fair weather over Great Britain, and milder but showery weather in Ireland. Pressure was highest over northern Europe, lowest over the Mediterranean, and to the westward of our islands, the gradients were slight, and the winds light and variable, but chiefly South-easterly at our western stations.

March 3-12.—This was a period of very changeable, showery weather, with occasional thunderstorms, hail, and sleet at intervals, and with temperature somewhat below the average. The winds varied greatly, but were chiefly Southerly and South-easterly over the northern parts of the country, and South-westerly in the south. Several depressions appeared, all of them small, and (though well marked) comparatively shallow. The first of these (No. XIII.) appeared off the north-west coast of Ireland early on the 3rd, and, travelling northwards, passed away from our area during the following night. The second was more clearly defined. Its centre reached the neighbourhood of Land's End early on the 4th, and, travelling across central England, reached the North Sea, between Aberdeen and Skudesnaes, by the 5th, and dispersed during that day (see Cyclonic System No. XIV. on p. 31). A third passed north-eastward outside our extreme west and north-west coasts on the 6th and 7th, at too great a distance for its track to be drawn in Map 2, Plate VII., or for its characteristics to be tabulated on p. 31, and a fourth (No. XV.) on the 9th, numerous shallow subsidiaries being meanwhile observed over our islands. Thus the showers which fell in all parts of the country were numerous, and at times heavy, but there were distinct intervals of bright sunshine which caused vegetation to advance steadily. On the 10th a singular fall of sleet and hail fell, first in the western and then in the northern parts of the country, accompanied by a decided fall of temperature, although the prevalent wind was Southerly to South-westerly. It will be remembered that a similar fall had occurred at the western stations about the middle of February, p. 18, and it does not appear possible at present to account satisfactorily for the phenomenon. After the 12th the irregularities in pressure-distribution began to disappear, the winds became more generally Southerly, and temperature rose decidedly.

March 13-18.—This was one of the finest and warmest periods that has been recorded over England at so early a date for many years past. Pressure was highest over Europe and lowest over the Atlantic, moderate and uniform gradients for Southerly winds being prevalent in all parts of the kingdom. The winds experienced over our islands and their neighbourhood were consequently Southerly in direction, and blew strongly over the western parts of the

kingdom, accompanied by cloud and rain, but moderately in the east, with fine bright weather. Temperature consequently rose steadily; on the 13th the daily maxima at our inland stations varied from 42° to 47° ; on the 14th they varied from about 55° to 60° ; on the 15th they had increased to between 64° and 67° ; and on the 17th they ranged from 65° to 70° . Large quantities of cirrus cloud were observed on several occasions, moving rather quickly from about S.S.W., and lightning was seen at some of the southern stations. In Ireland the thermometric readings were not nearly so high as those just quoted, the clouds remaining heavy in the west, while the strong winds which prevailed there were drawn from the (relatively) cool surface of the Atlantic instead of from the warmed surfaces of eastern Germany and western France. On the 18th, however, a large depression (No. XVII.) advanced towards our extreme northern coasts, and the weather became less settled, cooler, and cloudy.

March 19-21.—This was a cold, cloudy, and windy period. No sooner had the depression of the 18th passed away to the northward, then a new and deeper one (No. XVIII.) advanced rapidly from the North Atlantic to the north of Scotland. This brought with it South-westerly and Westerly gales, cold rain, sleet and hail, and during its prevalence temperature fell so decidedly that the maximum readings recorded over the inland parts of England on the 20th varied from only 49° to 54° , and during the succeeding night frost occurred on the grass over our northern and eastern counties. As this disturbance travelled away over Norway the barometer rose quickly in the United Kingdom, the wind veered to N.W., temperature again fell, and the eastern portion of an anticyclone showed itself over the Bay of Biscay.

March 22-30.—The weather during this period was anticyclonic. The system first appeared over the Bay of Biscay, and by slowly moving in a north-easterly direction, it covered the whole of our islands, and the northern and western parts of France by the 24th. Another high pressure area was then formed over northern Europe, and the two systems coalesced, so that at 8 a.m. on the 25th the appearance presented by the chart was that of a large ridge of high pressure extending in a south-westerly direction from the north of Scandinavia across the North Sea and the United Kingdom to the Atlantic. With some modifications this distribution of pressure remained with us till the 30th, producing North-easterly and Easterly breezes over nearly the whole of the British Isles and France, but with occasional spells of Southerly wind in Scotland. Temperature was rather low, especially over England and Ireland, the sky cloudy, and, while very little rain fell over Great Britain, a considerable quantity of cold rain, hail, and sleet was reported from Ireland, and the extreme south-west of England. A brilliant display of aurora occurred in the north of Scotland on the evening of the 28th.

On March 31st a new low-pressure system appeared off the west of Ireland, whence the isobars extended eastwards in a somewhat angular form over the Irish Sea and England. (See the Daily and Weekly Reports for this time.) The anticyclonic system then broke up, so far as our islands were concerned, and a new period of mild weather generally set in.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—MARCH, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XIII. March 3.	No. XIV. March 4-5.	No. XV. March 8-9.
Form - - - - -	Uncertain : apparently nearly circular	Elongated ; major axis lying from south to north.	Variable : apparently circular near its centre.
Size ; - - - - -	Moderate - - - - -	Varying ; but, on the whole, moderate	Apparently small.
Depth - - - - -	Moderate - - - - -	Shallow, but gradients somewhat decided near the centre.	Moderate.
Where first Observed - - -	Off the north-west of Ireland - -	Off the Land's End - - -	Off the west of Ireland.
Direction of Motion - - -	North-easterly to northerly - -	North-north-easterly - - -	About north-north-east.
Rate of Motion - - - - -	Slow - - - - -	Slow - - - - -	Moderate.
Regions passed over by Steepest Gradients.	Western parts of the British Islands	Ireland, England, and the Channel -	Scotland and the northern parts of Ireland.
Termination - - - - -	Travelled away to the northward -	Dispersed off the west of Norway -	Travelled away to the northward.
Time under Observation - -	1 day - - - - -	About 36 hours - - - - -	About 24 hours.
Accompanying Winds - - -	Southerly to Westerly, strong to a gale, in the west and north ; moderate Southerly in the east.	Southerly, strong to a gale, over England ; Northerly moderate to strong in Ireland and over the Irish Sea ; finally moderating at West.	Southerly strong winds and gales in the north and north-west, South-westerly and Westerly breezes elsewhere.
Weather - - - - -	Mild, and very wet in the west, with thunder locally ; cold and dry in the east.	Very rainy ; but clearing quickly in its rear.	Mild and showery at first, then much colder, with sleet and hail in many places. (See p. 29.)
Rainfall - - - - -	Considerable over our western districts, slight elsewhere.	Very general in our island. Heaviest in south of England.	—
REMARKS	This disturbance appeared on the western side of a ridge of high pressure which extended southwards from a high pressure area over northern Europe.	This depression appeared while No. XIII. was travelling away, and the high pressure area which had prevailed over northern Europe for some time was moving South-eastwards, and gradients for Southerly winds prevailed over the British Islands and their neighbourhood. In its rear the anticyclonic system No. VI. was formed over France.	This depression first came towards us when pressure was high both over northern Europe and in France, and as it moved north-eastwards a somewhat angularly shaped depression was formed over England and the North Sea, causing the wind over our southern counties to be much more Westerly than it would otherwise have been.

SECTION II.—*continued.*

TABLE OF CYCLONIC SYSTEMS.—MARCH, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XVI. March 11-13.	No. XVII. March 18-19.	No. XVIII. March 19-22.
Form - - - - -	Somewhat oval - - - - -	Uncertain; apparently nearly circular	Nearly circular.
Size - - - - -	Moderate - - - - -	Large - - - - -	Large.
Depth - - - - -	Shallow: gradients somewhat decided near the centre.	Apparently moderate - - - - -	Deep at first, then filling up gradually.
Where first Observed - - -	Over our south-eastern counties - - -	To the north-westward of our Islands	Off our north-western coasts.
Direction of Motion - - -	North-easterly till 12th, then easterly and south-easterly.	About north-easterly - - - - -	About E.N.E.
Rate of Motion - - - - -	Rapid at first; then moderate to very slow.	Moderate - - - - -	Moderate at first, then slow.
Regions passed over by Steepest Gradients.	Channel and North of France - - -	Ireland and Scotland - - - - -	The northern and north-western parts of the United Kingdom.
Termination - - - - -	Travelled away towards North Germany and filled up.	Travelled away along the coast of Norway.	Dispersed over Sweden.
Time under Observation - - -	2 days - - - - -	1 day - - - - -	3 days.
Accompanying Winds - - -	Southerly to Westerly gales in the north of France and over Belgium; North-easterly winds over our south-eastern counties.	Southerly and South-westerly gales in the western and northern parts of our islands.	South-westerly and Westerly, blowing a gale over all the more northern part of the country, and a moderate to fresh breeze in the south.
" Weather - - - - -	Very changeable; cold rain and sleet, followed by dry, cold air.	Showery, except over the Midland, Eastern, and South-eastern counties. Very fine over France. Thunderstorms in extreme N.W.	Mild and showery at first, then colder, with some sleet, hail, and cold rain.
" Rainfall - - - - -	General; heaviest in the south and east.	Slight, but general in the districts named above.	General, but slight.
REMARKS - - - - -	<p>This system came on while pressure was highest over Europe and lowest over the Atlantic, the gradients being moderate. Like those which preceded it, the depression was much smaller than those experienced in January, but deeper than the ordinary thunderstorm system of summer.</p> <p>With its disappearance the period of complex, changeable, unsettled weather ceased, and a fine warm period set in, accompanied by Southerly breezes.</p>		
	<p>At the time of the approach of this depression pressure was highest over France and Germany, whence a ridge extended Northwards over the Baltic and Gulf of Bothnia to Finland.</p> <p>The disturbance was apparently not complicated by any subsidiary system, but was followed quickly by system No. XVIII.</p>		
	<p>This disturbance had a threatening appearance when it first showed itself, but soon began to fill up. At 8 a.m. on the 21st it appeared to be subsidiary to some larger system in the far north, but its subsequent movements show that this was not so. In its rear the barometer rose quickly, and moderate North-westerly breezes prevailed for a time in all parts of the country.</p>		

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS, MARCH 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. VI. March 6-8.	No. VII. March 23-24.
Form - - - - -	Irregular ellipse - - - - -	Irregular and varying; somewhat oval on the 24th.
Size - - - - -	Small - - - - -	Small.
Height - - - - -	Very small - - - - -	Very small.
Where first Observed - - -	Bay of Biscay, on 5th - - -	Bay of Biscay.
Direction of Motion - - -	Easterly - - - - -	North-easterly.
Rate of Motion - - - - -	Moderate - - - - -	Slow.
Regions passed over - - -	Bay of Biscay and France - - -	France, United Kingdom, and North Sea.
Termination - - - - -	Dispersed over France - - -	Coalesced with another high pressure area over northern Europe, and remained over, or a little to the westward of that region during the rest of the month.
Accompanying Wind - - -	Very light and variable; Westerly over our Southern counties and Channel, Easterly in South of France.	Light: North-westerly at first, but drew into East as the centre moved northwards.
„ Weather - - - - -	Fine, hazy, cool - - - - -	Fair, but often dull and foggy over England and Scotland. Cold for the time of year over England.
REMARKS - - - - -	<p>On the 7th this system appeared to form a "ridge" to the larger high pressure system over Russia, but its separate existence was apparent (in the North German Bulletin) even on the 8th.</p> <p>The prevalence of Easterly winds and gloomy weather over England, while Southerly breezes and fair weather were at times felt in Scotland, made the mean temperature of the latter region to be higher than that of the former.</p>	

SECTION III.

REMARKS FOR MARCH 1884.

(Tables V. and VI., with Plates VI. and VII.)

Pressure.—The mean pressure of the month (at 8 a.m.) varied from about 29·95 inches over the south-eastern counties of England to about 29·68 inches in the Hebrides, the gradients (as might be anticipated, from the movements of the principal depressions, shown in Map 2, Plate VII.) being somewhat more decided over Ireland and Scotland than those over England. This distribution is favourable for winds from a more Southerly direction than is usual for the time of year. Over our southern counties the highest readings were recorded on the 6th, when the anticyclone No. VI. lay over France and the S. of England, but in the North the highest values were reached on the 26th or 27th, at which time an anticyclonic “ridge” stretched across the North Sea from Norway to the northern and north-eastern parts of Great Britain. In the North the lowest values occurred on the 20th, while the depression No. XVIII. was passing over, but the readings recorded at our Southern stations on this occasion were not nearly so low as those registered on the 11th when the depression No. XVI. passed over our south-eastern counties. In all cases the range was small.

Movements of Depressions.—These were uniformly in a north-easterly direction, and as a rule the rate of motion was rather slow. While the tracks of the majority lay outside our extreme north-western coasts, those of two well-marked disturbances passed more completely over our area. The depressions (excepting Nos. XVII. and XVIII.) were not large, and in their general features seemed to be midway between the usual large cyclones of Winter time, and the shallower “thunderstorm” depressions of the Summer.

Anticyclones.—There were only two clearly defined anticyclones which passed over our area during March, and they exhibited no features worthy of special note. Each of them coalesced with the larger continental high-pressure system as they moved inland; but as the first one passed to the southward of our islands it produced Westerly winds on our coasts, while the second, passing northwards, left us with breezes from the Eastward, and comparatively cold weather.

Winds.—The prevalent winds were South-westerly and Southerly on our south-western coasts, South-easterly and Southerly in the far north, and very variable in the south. At Shields the wind was much more Westerly than, apparently, it should have been on that part of our coast, owing to the tendency of the air to drift down the valley of the Tyne, whenever its movement is from any point to the westward of S.W.; under these circumstances its force, also, is usually greater than at other stations on our north-east coast. The gales were few in number and moderate in force, and were chiefly from the Southward and South-westward.

Temperature.—The mean temperature for the month varied from about 47° at the stations lying along our extreme south-western coasts, and 43° over the northern parts of Ireland and England, to somewhat below 42° over Scotland. There were the usual cold areas over the north of Ireland and the north-east and east of England. The Winter type of distribution (viz., low inland as compared with the coast temperatures) was maintained except over the south-eastern and some parts of the south Midland Counties, where there were some indications that the sun’s rays were beginning to show their power by modifying to some extent the rule just quoted. There were also several local irregularities, such as are frequently observed near this time of the year, when the mean temperatures of the sea and land do not differ much from one another. Compared with the mean condition of March for the 20 years 1861–80, the temperature of the month was rather high generally. The lowest readings were recorded on the 1st and 2nd over England and the east of Scotland, at which time anticyclonic South-easterly winds were prevailing very generally; the extreme point

reached was, however, not exceptional for the time of year, the lowest value reported being only 26° at Nairn and Cambridge, and 28° at Leith and Oxford. At our western stations and in the North of Scotland the lowest temperatures were recorded between the 8th and 11th, during the peculiar spell of cold referred to on p. 29. The warmest days were the 15th to 18th, the warmest of all being, generally, the 16th, when the thermometer rose to 70° at Cambridge and to 68° or 69° in many other parts of England. The range of temperature exceeded 40° over our eastern counties, while it did not exceed 26° in the south of Ireland and at Wick, and was only 22° at Sumburgh Head and 20° at Scilly.

Vapour Tension varied from 0·20 inch over the north-western counties of England and the north-east of Scotland, and from 0·22 inch over the north of Ireland, to 0·26 inch in the southern parts of England and Ireland, and to 0·27 inch at Valencia and Scilly. The *Relative Humidity* varied irregularly, the greatest difference being between Dover and Holyhead on the one hand, where it was 82 per cent., and Spurn Head on the other hand, where it was 91°. The value for Ardrossan (96) still appears too high, and has again been queried in Table V., p. 37.

Rainfall.—This was slight over England, especially at some of the eastern stations, while it was excessive in the south and south-west of Ireland. The largest total for the month was 10·9 inches at Valencia, while the smallest amounts were 0·7 inch at Spurn Head and Cambridge. The fall at Nairn (0·8 inch) was singularly small when compared with that at the other stations in the north-east of Scotland, the values for which were 2·7 inches at Wick, and 3·4 inches at Aberdeen.

TABLE V.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
Observations are made at 8 a.m. daily, but the Number of Days of Rain, Snow, Hail,
(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head	ins. 29°768	41°0	36°4	44°9	40°7	32	11th, 21st	54	16th
	Wick	29°755	41°2	36°7	46°1	41°4	29	11th	55	17th
	Stornoway	29°675	41°5	36°7	46°6	41°7	30	29th	54	16th, 17th
1. SCOTLAND, E.	Nairn	29°749	39°9	35°6	48°7	42°2	26	1st	65	16th
	Aberdeen	29°811	40°5	36°2	46°6	41°4	30	1st	57	17th
	Leith	29°812	41°0	35°7	48°8	42°3	28	1st	68	16th
2. ENGLAND, N.E.	Shields	29°870	41°2	37°4	47°9	42°7	30	1st	64	17th
	York	29°908	40°0	35°7	50°9	43°3	27	2nd	68	16th
	Spurn Head	29°903	41°7	38°4	47°0	42°7	32	1st	59	18th
3. ENGLAND, E.	Yarmouth	29°936	41°9	37°6	46°8	42°2	29	1st	62	18th
	Cambridge	29°937	41°0	35°1	52°4	43°8	26	1st	70	16th
4. MIDLAND COUNTIES	Loughborough	29°919	39°4	36°0	51°6	43°8	29	1st, 2nd, 3rd, 24th, 3rd	69	16th
	Oxford	29°942	40°8	36°9	51°4	44°2	28		67	16th
5. ENGLAND, S.	London	29°951	42°0	37°5	52°1	44°8	27	1st, 3rd	68	16th
	Dover	29°936	43°5	39°6	48°9	44°3	31	3rd	57	15th
	Hurst Castle	29°938	42°8	39°6	50°5	45°1	32	6th	59	16th
6. SCOTLAND, W.	Ardrossan	29°799	41°3	38°1	46°4	42°3	30	1st	63	16th
7. ENGLAND, N.W.	Hawes Junction*	28°625	37°3	32°7	43°9	38°3	25	1st, 11th	62	16th, 17th
	Barrow-in-Furness	29°865	41°1	38°1	47°5	42°8	32	1st	59	16th
	Liverpool	29°880	41°1	38°1	49°1	43°6	31	1st	65	16th
	Holyhead	29°849	43°0	38°1	48°4	43°3	29	11th	60	15th
8. ENGLAND, S.W.	Pembroke	29°866	43°6	41°2	47°5	44°4	33	11th	56	16th
	Prawle Point	29°922	44°6	40°2	49°5	44°9	36	2nd, 10th, 11th	56	16th
9. IRELAND, N.	Donaghadee	29°814	41°5	37°8	47°4	42°6	29	11th	54	16th
	Mullaghmore	29°729	43°3	39°2	49°1	44°2	30	8th	62	16th
10. IRELAND, S.	Parsonstown	29°806	41°6	37°8	49°7	43°8	28	8th	59	16th
	Valencia	29°771	46°1	41°6	51°4	46°5	31	11th	57	15th, 16th
	Roche's Point	29°818	45°0	41°0	50°8	45°9	33	8th, 10th	56	18th
CHANNEL ISLANDS	Scilly (St. Mary's)	29°865	47°1	43°4	50°9	47°2	37	11th	57	17th
	Jersey (Noirmont)	29°948	45°1	42°1	50°7	46°4	36	1st	61	17th

* Hawes Junction is 1,125 feet above Mean Sea Level, and the

- TABLE V.

REPORTING STATIONS in the BRITISH ISLANDS during the Month of March 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred, beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER.							WIND.								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calm.
ins. 0.231	% 90	7.2	ins. 3.80	ins. 0.79	7th	22	2	0	0	3	12	5	1	1	0	9	14	2	1	2	1
'225	88	5.7	2.65	0.50	10th	15	0	0	0	8	11	4	1	0	0	1	19	3	1	5	1
'232	89	6.7	4.04	0.51	13th	22	3	4	0	8	16	7	0	0	2	8	11	3	4	3	0
'204	84	5.7	0.83	0.24	7th	13	0	0	0	11	11	2	0	0	2	3	2	10	4	1	9
'211	84	5.6	3.40	0.74	8th	21	3	0	0	9	11	5	0	0	1	5	13	7	3	2	0
'213	83	5.8	1.33	0.30	4th	15	2	0	0	7	8	2	0	1	2	4	5	6	5	2	6
'223	87	7.8	2.21	0.82	4th	13	1	1	0	4	17	3	0	3	2	1	4	9	7	1	4
'215	87	6.5	1.78	0.52	4th	10	2	0	0	8	14	0	2	5	2	4	8	3	3	3	1
'238	91	5.2	0.72	0.20	3rd	11	0	0	0	8	4	4	2	4	3	5	9	3	2	3	0
'232	88	5.5	1.12	0.33	10th	19	1	0	0	5	5	0	2	5	4	3	7	2	3	3	2
'225	88	6.8	0.73	0.22	3rd, 10th	7	0	0	0	9	18	0	3	4	2	3	8	5	2	3	1
'216	90	8.1	1.87	0.64	3rd	11	2	1	0	3	21	5	3	2	1	7	5	3	5	3	2
'221	88	6.5	1.46	0.52	3rd	9	1	1	0	11	17	0	2	6	1	4	7	5	2	2	2
'223	84	6.6	1.11	0.48	10th	9	0	0	0	7	14	1	2	4	2	5	5	5	3	3	2
'233	82	4.1	1.06	0.32	10th	14	0	1	0	13	5	0	8	3	5	1	4	2	6	1	1
'257	94	5.0	2.15	1.08	3rd	11	0	0	0	9	3	3	3	4	6	1	5	4	4	2	2
'247	906	7.9	1.53	0.36	3rd	22	1	0	0	5	21	4	0	4	9	3	6	4	2	2	1
'199	90	6.5	4.76	1.36	4th	18	6	0	0	8	17	1	0	4	3	3	6	10	5	0	0
'220	85	6.8	3.47	1.34	4th	15	0	0	0	1	11	4	3	7	3	8	3	3	1	3	0
'216	84	7.6	2.23	0.81	4th	15	3	0	0	1	15	0	0	3	4	12	2	5	3	2	0
'228	82	7.6	3.87	0.69	4th	21	0	1	1	6	19	1	1	0	3	5	11	5	4	2	0
'246	86	6.9	4.79	0.78	3rd	19	0	0	0	5	13	0	1	1	9	3	5	7	3	1	1
'260	89	5.9	2.02	0.70	3rd	16	0	1	0	11	12	1	2	6	3	4	6	1	6	3	0
'238	91	7.4	3.04	0.85	30th	24	0	1	0	5	17	5	0	0	3	3	12	7	6	0	0
'242	86	7.6	2.90	0.50	9th	22	3	9	0	2	10	10	0	0	3	8	5	10	4	1	0
'222	85	6.8	2.91	0.47	6th	18	1	0	1	4	15	0	0	0	1	5	12	5	2	0	6
'271	87	8.2	10.86	1.80	6th	28	1	1	1	0	17	11	1	0	3	5	8	5	3	3	3
'260	87	8.5	5.11	0.70	9th	22	1	0	0	2	20	7	2	2	1	3	10	5	7	1	0
'274	85	8.3	4.13	1.04	3rd	23	0	1	0	1	15	4	2	2	5	3	6	7	3	2	1
'265	88	5.4	1.89	0.66	3rd	12	0	1	0	11	10	2	1	4	5	4	5	3	5	4	0

barometric observations at this Station are not reduced to sea level.

TABLE VI.

OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the month of March 1884.

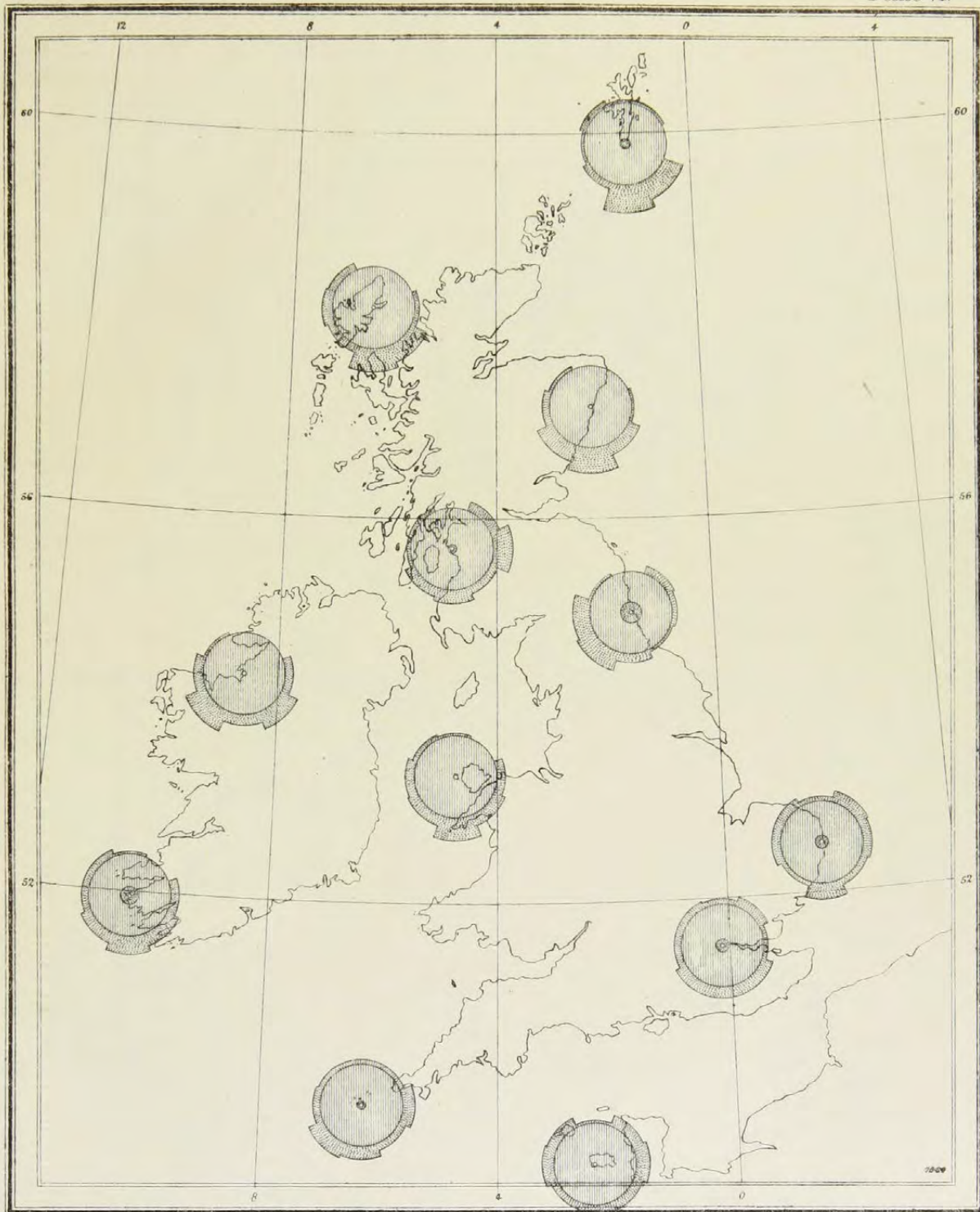
STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per- centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Mini- mum.	Date.	Maxi- mum.	Date.			
STORNOWAY - -	*	*	*	*	*	*	*	*	88	24
ABERDEEN - -	*	*	*	*	*	*	*	*	79	22
ALNWICK CASTLE - -	36°3	46°0	41°2	28	10th	59	17th	2°69	—	—
DURHAM - -	†	†	†	†	†	†	†	†	†	†
SCARBOROUGH - -	38°4	48°3	43°4	32	3rd	65	17th	2°16	—	—
YORK - -	*	*	*	*	*	*	*	*	87	24
HILLINGTON - -	35°6	51°2	43°4	25	1st	69	16th	1°29	98	27
GELDESTON - -	36°7	51°0	43°6	25	3rd	67	16th, 17th	1°23	108	30
CAMBRIDGE - -	*	*	*	*	*	*	*	*	110	30
ROTHAMSTED - -	35°5	50°3	42°9	26	1st, 3rd	66	16th	1°66	—	—
BAWTRY - -	34°6	51°5	43°1	24	1st	70	16th	1°35	—	—
LEICESTER - -	37°1	51°9	44°5	29	24th	69	16th	1°62	85	23
BIRMINGHAM - -	35°6	49°8	42°7	30	2nd, 3rd, 26th	67	16th	2°15	—	—
CHEADLE - -	35°3	48°5	41°9	29	1st, 2nd	66	16th	2°24	—	—
CHURCHSTOKE - -	35°0	49°2	42°1	29	11th, 24th, 26th.	65	16th	2°88	104	29
HEREFORD - -	36°7	51°7	44°2	30	12th, 24th	66	16th	2°28	—	—
CIRENCESTER - -	34°8	49°3	42°1	26	3rd	65	16th	2°29	92	25
OXFORD - -	*	*	*	*	*	*	*	*	103	28
LONDON - -	*	*	*	*	*	*	*	*	86	24
MARLBOROUGH - -	35°5	49°7	42°6	27	3rd	64	16th	2°57	86	24
STRATHFIELD TURGISS -	35°2	52°1	43°7	25	3rd	67	16th	1°72	—	—
HASTINGS - -	40°6	50°1	45°4	32	1st	60	15th	1°77	130	36
SOUTHAMPTON - -	38°7	52°5	45°6	30	3rd	62	16th, 17th	2°39	111	30
LAUDALE - -	38°7	48°7	43°7	31	1st	61	16th	8°39	—	—
GLASGOW - -	37°7	46°7	42°2	30	1st	62	16th	2°38	56	15
SILLOTH - -	37°6	48°6	43°1	30	11th, 26th	67	16th	2°78	74	20
DOUGLAS - -	38°7	46°8	42°8	28	11th	56	16th	3°28	81	22
NEWTON REIGNY - -	35°9	47°3	41°6	27	26th	67	15th	3°38	85	23
STONYHURST - -	36°8	48°2	42°5	30	1st	65	16th	2°75	75	21
BLACKPOOL - -	36°9	48°2	42°6	28	11th	64	16th	3°04	68	19
MANCHESTER - -	35°9	48°5	42°2	30	1st, 2nd	67	16th	1°90	—	—
LLANDUDNO - -	39°6	49°7	44°7	30	11th	68	16th	2°12	70	19
PEMBROKE - -	*	*	*	*	*	*	*	*	119	33
ARLINGTON - -	37°3	42°8	40°1	31	10th, 24th	62	16th	4°12	—	—
CULLOMPTON - -	36°8	51°0	43°9	28	12th	60	18th	3°77	98	27
FALMOUTH - -	42°6	49°7	46°2	36	11th	57	17th	4°19	97	27
PLYMOUTH - -	40°3	51°8	46°1	33	6th	60	15th	3°41	116	32
JERSEY - -	*	*	*	*	*	*	*	*	168	46
LONDONDERRY - -	37°9	50°0	44°0	30	11th	65	16th	3°13	—	—
MARKEE CASTLE - -	37°2	48°7	43°0	29	8th, 11th	63	16th	2°49	73	20
BROOKEBOROUGH - -	36°5	47°8	42°2	28	11th	62	16th	3°23	—	—
ARMAGH - -	38°5	48°0	43°3	29	11th	59	16th	2°84	64	18
DUBLIN - -	40°3	50°5	45°4	31	11th	61	15th, 16th	1°86	88	24
PARSONSTOWN - -	*	*	*	*	*	*	*	*	78	21
KILKENNY CASTLE - -	37°9	49°6	43°8	27	10th	57	15th, 16th	3°49	—	—
WATERFORD - -	38°7	49°4	44°1	29	10th, 11th	56	14th	4°25	—	—
VALENCIA - -	*	*	*	*	*	*	*	*	89	24
FOYNES - -	†	†	†	†	†	†	†	†	—	—

* Information to be found in Table I.

† Records incomplete.

MONTHLY WIND CHART FOR MARCH 1884.

Plate VI.



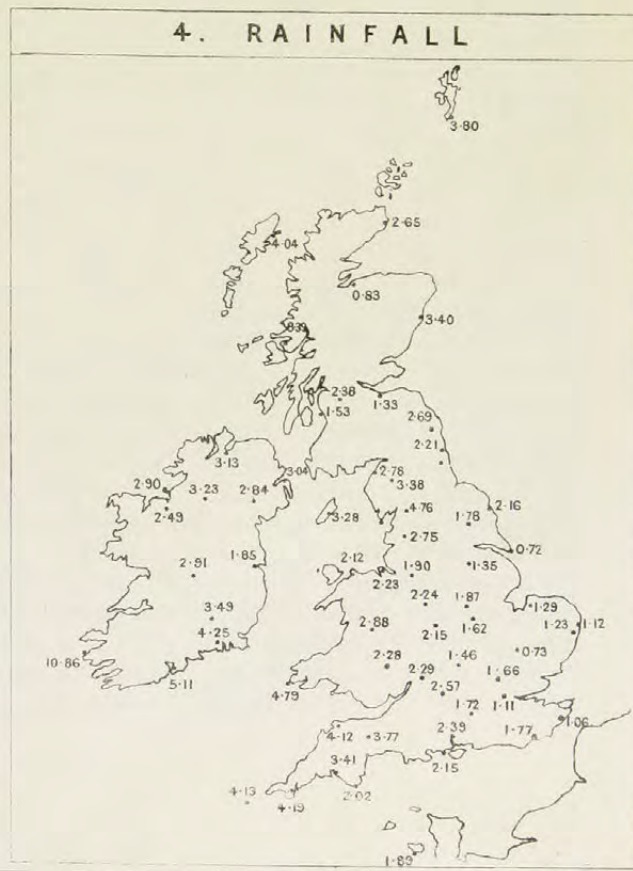
To face p. 38.

DANGERFIELD LITH 22 BEDFORD ST COVENT GARDEN

2. MOVEMENTS OF DEPRESSIONS.



4. RAINFALL



DANGERFIELD LITH 22 BEDFORD ST COVENT GARDEN " 1980

MONTHLY WEATHER REPORT.

APRIL 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather of April consisted of three distinct periods:—(1) A comparatively mild period, which lasted till the 7th. (2.) An anticyclonic period, of cold dry North-easterly and Easterly winds, lasting from the 8th to the 25th. In it the temperature was much below its average value, and during its latter portion destructive frosts occurred over England. (3) A period of less cold weather than that last mentioned, lasting from the 26th to the end of the month, marked by very variable winds, showery weather, and local thunderstorms. On the whole, however, the mean temperature of the month was below its normal value especially over the south of England; the rainfall was deficient, but the clouds were heavy and numerous, and the amount of bright sunshine was consequently very small.

April 1–7.—During this period the distribution of pressure, the winds, and the weather were of a southerly type. For the first two days the pressure distribution was simple, the barometer being, on the whole, highest over Russia and the Baltic, and lowest to the westward of Ireland, and there were no subsidiary disturbances worth noting. The sky consequently cleared and the thermometer rose quickly, so that for a time the weather was remarkably similar to that observed over England about the middle of March. The maximum readings recorded varied from 65° to 68° over England, both on the 2nd and 3rd, but on the latter day the sky began to wear an unsettled appearance over London and its vicinity, and several complications ensued. A moderate-sized depression appeared off the south-west of Ireland on the 3rd and advanced eastwards slowly, till, at 8 a.m. on the 4th, its centre was not many miles to the southward of Cape Clear (see the charts given in the Weekly Weather Report, page 54). The movements of this disturbance were peculiar, and are shown as nearly as possible by the arrow marked XIX. on Map 2, Plate IX. A shallow subsidiary was formed over the Bristol Channel on the 3rd, and, moving northwards, reached the Irish Sea near Barrow-in-Furness by 6 p.m., and the west of Scotland by 8 a.m. the next day, whence it apparently passed northwards and dispersed. No sooner had it gone, however, than another small subsidiary disturbance appeared at the mouth of the English Channel, and this moved quickly in about a north-north-westerly direction across St. George's Channel, so that at 8 a.m. on the 5th it lay over the north of Ireland (see the chart for that date in the Weekly Weather Report, page 55, and the arrow XIXb. on Map 2, Plate IX. in the present Report). From this position it travelled away to the north-westward. The larger depression in the south-west then dispersed, and the barometer rose quickly in the south-west and south. The principal effects resulting from these small disturbances were (1) the spreading of the cyclonic conditions (viz., the strong South-easterly and Southerly winds, rain, thunder, and lightning) over nearly the whole of our Islands, and (2) a great reduction from the high temperature which had been experienced on the 1st and 2nd. The rainfall, however, was not heavy, except near the mouth of St. George's Channel, where it amounted to an inch, or more.

On April 6th another depression appeared off our north-west coasts, but it travelled quickly away to the northward, without coming sufficiently near to us for its movements to be shown on Map 2, Plate IX. During the night of the 6th (pressure being still highest in the north-east and lowest in the west) a shallow depression was formed over the north-east of France (see the 6 p.m. synoptic chart in the Weekly Weather Report, page 55), and this advanced northwards, bringing local thunderstorms and much rain to the south-eastern and eastern parts of England, while fair weather prevailed in the west. Great variations in the direction of the wind were caused by this disturbance over all the eastern parts of the country, but these were followed by a settling down finally to a light breeze from the northward. The system apparently broke up over the North Sea on the 7th; and a complete change took place in the distribution of pressure, and, consequently, in the winds and weather also.

April 8–25.—Throughout the whole of this period the conditions over our Islands were more or less anticyclonic, the air was cold and searching, sharp frosts were felt at times, and the winds were chiefly Northerly to Easterly in direction. The period may, however, be subdivided as follows:—(1.) From the 8th to the 10th, when an arm (or “ridge”) of high pressure extended from the Scandinavian anticyclone across the North Sea and our Islands, producing North-easterly winds over England and the Channel, while Southerly and South-easterly winds prevailed in the north. Temperature during this time decreased, but was not very low, and while dry weather prevailed in most places, some rain showers fell in the north-eastern parts of Great Britain on the 8th, and hail showers in the south-east next day. (2.) From the 11th to the 16th, when, owing to a fall of the barometer over the Baltic and northern Europe, the area of highest pressure was transferred to a position off our north-western coasts, while a ridge extended thence in a south-south-easterly direction over the whole kingdom. The wind consequently backed to the northward on our North Sea coasts, but became at first South-easterly and then Easterly in the west. Temperature fell fast, and the mean temperature over England at this time was as low as that of February: some of the night frosts were very keen (see the Daily and Weekly Weather Reports for about this date). Showers of sleet, soft hail, and snow fell in the north and east, and gradually spread over the country; the air was, on the whole, cold and searching, and on several of the nights frost occurred at our inland stations. These conditions continued with little modification till about the 16th, and during their prevalence dry North-easterly winds prevailed very generally, with cold showers separated by bright intervals. (3.) On April 17th pressure began to give way over Scandinavia, and being already relatively low over the south of France, a band of relatively high pressure was left over the British Islands and the North Sea, lying west and east from the Atlantic to the Baltic and North Germany. Thus, while North-easterly breezes continued to blow in the south, Westerly winds appeared for a time at our northern stations (see the daily charts in the Weekly Weather Report, p. 62), but soon disappeared as the band of high pressure again spread northwards, and North-easterly winds became general, with a further decrease of temperature. On April 20th pressure gave way a little on our Atlantic coasts, and the high-pressure band assumed the form of a well-developed ridge extending south-westward, from a large high-pressure area whose centre lay over northern Europe, right over the North Sea and our Islands. With this change the cold became still more severe, so that not only were the mean daily temperatures from five to ten degrees below the average for the time of year, but the night frosts were very sharp—especially in some parts of Surrey, where the fruit crops suffered severely. The very cold spell continued till the 25th, when the whole system which had prevailed since the 8th began to break up.

April 26–30.—The distribution of pressure now became irregular, although the gradients were not steep. An ill-formed depression appeared off our north-western coasts on the 26th, causing Southerly winds for a time, but dispersing quickly. Another shallow system (No. XXI.) moved north-north-westwards over the eastern shores of the North Sea

on the 26th, while a third, of complex form (No. XXII.), came in over our south-western counties on the 27th, and dispersed near London early on the 29th. These depressions brought with them cold rain, thunder, and lightning to the regions which they visited, together with some (irregular) increase of air temperature, and displaced the searching, parching North-easterly and Easterly winds of the previous three weeks. Pressure now became more uniform over the southern parts of the kingdom, and although a new cyclonic system (see No. XXIII., p. 43, and Map 2, Plate IX.), approached our north-western coasts on the 29th, it brought with it only moderate gradients for Southerly to Westerly breezes. Temperature rose decidedly, and warm showers fell in most places, accompanied by some thunder in the south-east.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—APRIL, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XIX. April 4-5.	No. XX. April 14-16.
Form - - - - -	Doubtful; apparently nearly circular - -	Elongated and somewhat complex, having two minima.
Size - - - - -	Moderate - - - - -	Moderate - - - - -
Depth - - - - -	Shallow - - - - -	Very shallow - - - - -
Where first Observed - - - - -	To the south-westward of Ireland - - -	Off the west of Norway - - - - -
Direction of Motion - - - - -	Doubtful; apparently North-easterly at first, then North-westerly.	South-easterly - - - - -
Rate of Motion - - - - -	Slow - - - - -	Moderate - - - - -
Regions passed over by Steepest Gradients	Over our western and northern coasts - -	Norway, the northern parts of the North Sea, and the east of Scotland.
Termination - - - - -	Passed out to sea again - - - - -	Part of it dispersed, but the southern portion travelled away to the Baltic and grew larger.
Time under Observation - - - - -	Nearly two days - - - - -	About 30 hours - - - - -
Accompanying Winds - - - - -	South-easterly to Southerly, moderate and strong	Westerly to Northerly at the northern stations only. The Northerly winds blew strongly on our north-east coasts for a time.
„ Weather - - - - -	Dull and showery; thunder and lightning locally.	Cold showers over Great Britain - - -
„ Rainfall - - - - -	General, but not heavy except on our south-western and western coasts.	The rainfall from this depression seems to have been confined to our northern and north-eastern coasts. That in the south apparently belonged to another system.
REMARKS - - - - -	<p>This disturbance approached our south-western coasts when pressure was highest over northern Europe and rather high in the south of France also.</p> <p>Its distance from our Islands was considerable, but during its stay several subsidiary disturbances (Nos. XIXA. and XIXB. on the map) were developed, which caused the thundery unsettled weather to spread all over the kingdom.</p>	
	<p>This depression came towards Norway when pressure was highest to the westward of Scotland and lowest over south-eastern Europe. It was, however, too shallow, and its distance from us was too great for any serious effects to be produced on our coasts.</p> <p>The northern minimum broke up over Scandinavia on the 15th, while the southern one (marked XXA. on Map 2, Plate IX.) travelled south-eastwards to the Sound.</p>	

ANTICYCLONIC SYSTEMS - - - - -

Although from the 8th to the 25th of the month there was a constant succession of anticyclonic ridges or cols prevalent over our Islands and was both small and unimportant, and was subsidiary to a large system, the centre of which lay over the Atlantic. The centre of the small anticyclone was therefore, not been possible to tabulate its characteristics in the ordinary form.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—APRIL, 1884.

No. XXI. April 26-27.	No. XXII. April 27-28.	No. XXIII. April 29-30.
Nearly circular - - - - -	Elongated, and somewhat complex, having two minima.	Varying greatly.
Small - - - - -	Small - - - - -	Apparently moderate.
Very shallow - - - - -	Shallow - - - - -	Shallow.
Over the Sound - - - - -	At the mouth of the Bristol Channel - - -	To the westward of the Hebrides.
Northerly and north-north-westerly - - -	Easterly - - - - -	North-easterly and northerly.
Slow - - - - -	Moderate at first, then slow - - - - -	Apparently slow.
Sweden - - - - -	France, the Channel, and the southern counties of England.	The north of Scotland and west of Norway.
Travelled away in a north-north-westerly direction to the Atlantic.	The more westerly of the minima dispersed over France on the 29th, the easterly part dispersed over the home counties on the 28th.	Travelled away to the northward.
About 30 hours - - - - -	About 30 hours - - - - -	About two days.
Strong South-easterly in Sweden, light North-westerly, and backing, on the eastern shores of the North Sea.	Moderate North-easterly over our northern counties, fresh to moderate South-westerly to Westerly and North-westerly in the south.	Strong Southerly in front of the disturbance, moderate Westerly in its rear.
Rainy to the eastward of the North Sea - - -	Dull, close, and rainy, with thunderstorms in many places, most in the west.	Some showers in the extreme west and north.
None fell over our Islands except on the extreme north-eastern coasts.	Comparatively slight; none in the north of Scotland.	Very partial, and slight at first.
This disturbance appeared as the anticyclonic system, which ended on the 25th, was breaking up. Its distance was too great for our weather to be much affected, and its movement was apparently decided by the high-pressure area which still lay over northern Europe.	This disturbance also reached our coasts during the transitional period from the cold anticyclonic Easterly winds to one of South-westerly breezes and mild weather. The cyclonic circulation of winds round the depression was complete, but their force was never great. The more westerly of the two minima, after reaching Cornwall, travelled abruptly away in a south-south-easterly direction, and reached the south-west of France by 8 a.m., 29th. It then dispersed.	This disturbance appeared in the north just as No. XXII. was breaking up, and (together with some subsidiary disturbance which appeared over England on the 30th), brought about a return of South-westerly and Westerly winds to all our coasts.

ANTICYCLONIC SYSTEMS.

their neighbourhood (for particulars of which see pp. 39 to 41), there was only one occasion on which a fully-developed anticyclone was observed. This near Copenhagen at 8 a.m. (18th), but by 6 p.m. all its regularity of form had disappeared, and at 8 a.m. on the 19th it was no longer traceable. It has,

SECTION III.

REMARKS FOR APRIL 1884.

(*Tables VII. and VIII. with Plates VIII. and IX.*)

Pressure.—The mean pressure at 8 a.m. varied from about 29·89 inches at Sumburgh Head, and from 29·88 inches in the east of Scotland to 29·76 inches at the Scilly Islands. The general tendency was, therefore, favourable for the prevalence of Easterly and South-easterly winds, whereas the average conditions at this time of year are favourable for winds from the South-westward, but the gradients were very slight, especially over Scotland and Ireland. The highest readings were recorded during the anticyclonic conditions reported on the 14th, when the barometer rose to nearly 30·4 inches at Stornoway and to 30·0 inches even on our extreme south-eastern coasts. The lowest values were registered on the 5th, at which time the depression No. XIX. was lying over the north of Ireland. The range, however, was small, except in Ireland, where it amounted to about an inch and a half.

Movements of Depressions.—The depressions which passed over these Islands during April were almost all subsidiary to larger disturbances, the centres of which lay outside our area. They travelled chiefly from south-south-east to north-north-west, and brought with them thunderstorms, rain, and hail. One shallow disturbance (No. XXIII.) passed in a north-easterly direction far to the northward of our northern coasts on the 29th; but the most singular occurrence with regard to the movements of the cyclonic systems during this month, was the simultaneous advance in an easterly direction of No. XXII. over our south-western districts, while No. XXI. was travelling in a north-north-westerly direction over the eastern shores of the North Sea. Another feature worth noting is, that the very shallow subsidiary disturbance (No. XIXA.), which passed northwards over our western stations on the 3rd, was actually formed over our Islands, while that which reached our south-eastern counties on the 7th dispersed slowly soon after it reached the North Sea. (See p. 40.) Another disturbance (No. XX.), which, when it reached Norway on the 15th, had two distinct minima, underwent great modifications, the more northern minimum filling up while the southern one continued its progress to the Baltic for some time longer.

Anticyclones.—No well-formed anticyclone was observed in our neighbourhood except on the 18th, when a very small one appeared near Copenhagen for a few hours, and again dispersed. Anticyclonic “ridges” and “cols” were, however, very prevalent between the 8th and 25th.

Winds.—The bulk of the winds observed during this month came from the eastern (north-east to south-east) quarter of the compass, and in force they were, as a rule, moderate or light. This prevalence of Easterly wind is only what might be inferred from an examination of the charts given in the Daily and Weekly Weather Reports, but the final results are more clearly shown in the wind chart, Plate VIII., appended to this Report. Of gales there were few; those experienced on our western coasts were Southerly, while those felt in the south were Easterly, but none of them require particular mention.

Temperature.—The mean (sea level) temperature of the month varied from about 48° in the extreme south-west of Ireland and in the Scilly Islands and from a little above 46° over Sussex, Kent, Middlesex, and the south Midlands, to 43° in the extreme east of Scotland. Its distribution between these extremes, however, was by no means regular, the curves over the northern and western portions of the kingdom showing a persistent adherence to the winter type, while those over our south-eastern counties showed that the solar influence on the land was becoming apparent, by the area of comparative warmth which spread northwards from Hampshire and Sussex over the home counties, and away in a north-westerly direction to Cheshire, and in a north-easterly direction towards Lincolnshire. The

readings show a deficit generally from the average values for the 20 years 1861-80, the main difference being over Ireland and the southern parts of England, where it amounts to between 3° and 5° , while in the extreme north of Scotland it is only 1° . The *coldest* weather occurred over England between the 23rd and 25th, but some localities in the neighbourhood of Epsom were severely affected on each night between the 20th and 25th. In Scotland the sharpest night occurred a day or two later, but Wales and the western parts of England had their minimum on the 19th, while in Ireland the dates varied greatly with the locality. The warmest days, however, were undoubtedly the 2nd and 3rd over the greater part of England, the 8th and 9th at the more western stations, and the 10th over Ireland and Scotland. The exceptional cases of Yarmouth, with its maximum on the 30th, Roche's Point on the 28th, and Valencia on the 21st, are the results of purely local causes.

Vapour Tension, as a rule, was lowest (0·23 inch) at the inland stations both in Ireland and Great Britain, and highest (0·27 inch) on our extreme south-western coasts; while the *Relative Humidity* was lowest over the northern parts of Scotland, the valley of the Forth, North Wales, and the home counties.

Rainfall was deficient almost everywhere—especially over the north-east of Scotland and the Midland and eastern parts of England. The deficiency, however, was not large at the majority of stations, but the effects of the drought were rendered more apparent by the fact that the drying power of the winds experienced during the anticyclonic portion of the month soon obliterated all traces of the cold passing showers which fell from time to time during their continuance.

TABLE VII.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
Observations are made at 8 a.m. daily, but the Number of Days of Rain, Snow, Hail, Thunder-
(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 82° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			Means of				Absolute Extremes.			
			At 8 a.m.	Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head	ins. 29° 88'9	42° 9	37° 6	46° 4	42° 0	34	23rd, 30th	50	10th
	Wick	29° 87'9	44° 0	37° 7	49° 2	43° 5	30	27th	58	6th
	Stornoway	29° 85'3	44° 1	38° 3	49° 9	44° 1	32	1st, 3rd, 27th	57	10th
1. SCOTLAND, E.	Nairn	29° 86'2	42° 4	36° 9	51° 9	44° 4	30	1st, 21st	60	4th
	Aberdeen	29° 87'9	43° 3	36° 7	49° 0	42° 9	29	28th	56	3rd, 8th
	Leith	29° 85'7	44° 6	37° 1	51° 7	44° 4	28	25th	61	2nd
2. ENGLAND, N.E.	Shields	29° 85'7	44° 2	38° 4	48° 4	43° 4	33	26th	59	6th
	York	29° 85'7	44° 0	37° 8	52° 9	45° 4	27	24th	67	3rd
	Spurn Head	29° 83'7	44° 9	40° 6	48° 3	44° 5	36	18th	56	6th
3. ENGLAND, E.	Yarmouth	29° 83'3	44° 7	40° 6	48° 3	44° 5	35	26th	57	30th
	Cambridge	29° 83'2	44° 9	35° 3	53° 6	44° 5	24	19th	68	2nd, 3rd
4. MIDLAND COUNTIES	Loughborough	29° 83'9	42° 8	37° 0	53° 2	45° 1	25	23rd	66	3rd
	Oxford	29° 83'6	43° 5	38° 3	52° 3	45° 3	27	23rd	64	2nd
5. ENGLAND, S.	London	29° 83'1	45° 2	38° 9	53° 3	46° 1	27	23rd	68	2nd
	Dover	29° 80'2	46° 2	42° 0	50° 3	46° 2	35	24th, 26th	60	2nd, 3rd
	Hurst Castle	29° 81'5	44° 0	38° 9	51° 5	45° 2	31	23rd	58	4th
6. SCOTLAND, W.	Ardrossan	29° 84'2	44° 3	38° 9	52° 0	45° 5	34	1st	58	3rd, 7th
7. ENGLAND, N.W.	*Hawes Junction	28° 60'2	40° 2	33° 9	47° 1	40° 5	25	24th	59	3rd
	Barrow-in-Furness	29° 84° 0	43° 2	39° 8	52° 8	46° 3	33	18th	63	3rd
	Liverpool	29° 83'7	44° 6	39° 8	52° 1	46° 0	31	18th	63	3rd
	Holyhead							Record incomplete, owing		
8. ENGLAND, S.W.	Pembroke	29° 80'4	45° 2	41° 2	49° 6	45° 4	34	18th	56	30th
	Prawle Point	29° 80'7	45° 8	39° 8	51° 1	45° 5	32	19th	57	9th
9. IRELAND, N.	Donaghadee	29° 84'2	44° 8	40° 5	50° 2	45° 4	33	11th	56	6th, 7th
	Mullaghmore	29° 80'6	44° 7	42° 1	53° 2	47° 7	35	1st	59	9th
10. IRELAND, S.	Parsonstown	29° 82'7	43° 0	36° 6	53° 8	45° 2	28	18th	60	9th, 10th
	Valencia	29° 78'8	47° 5	42° 3	53° 1	47° 7	34	20th	58	10th, 21st
	Roche's Point	29° 80'4	46° 9	41° 6	53° 3	47° 5	37	14th, 18th, 20th.	57	7th, 8th, 28th
CHANNEL ISLANDS	Scilly (St. Mary's)	29° 76'4	48° 2	43° 6	51° 7	47° 7	38	18th	57	6th
	Jersey (Noirmont)	29° 78'2	46° 2	42° 4	51° 2	46° 8	39	18th, 19th, 20th, 21st, 22nd, 25th.	57	2nd

* Hawes Junction is 1,135 feet above the Mean Sea Level, and the

TABLE VII.

REPORTING STATIONS in the BRITISH ISLANDS during the Month of April 1884.

storms, and Gales are counted irrespective of the hours at which they occurred.

beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calms.
ins.	%		ins.	in.																	
0.252	91	7.8	1.65	0.38	1st	18	0	0	0	3	18	1	5	5	1	9	8	1	0	1	0
0.238	82	6.0	0.67	0.15	2nd	11	0	1	1	9	9	2	3	3	2	5	13	1	0	3	0
0.247	85	6.7	1.54	0.69	30th	13	1	0	0	8	13	3	3	6	4	5	7	1	1	2	1
0.220	85	6.4	0.53	0.10	2nd, 12th, 18th.	11	0	0	0	9	15	0	1	4	4	1	2	3	1	1	13
0.235	84	7.2	1.49	0.38	1st	23	0	0	0	5	15	2	6	2	1	5	7	3	1	2	3
0.235	79	7.0	0.77	0.26	2nd	14	0	0	1	5	13	0	2	6	2	12	0	2	3	3	0
0.253	87	8.0	2.11	0.26	1st	22	0	2	1	2	17	1	3	10	3	2	4	2	2	1	3
0.244	84	5.9	1.44	0.28	27th	19	0	0	1	10	12	0	10	7	6	1	4	2	0	0	0
0.252	85	4.8	0.74	0.20	6th	14	0	1	0	6	1	0	7	8	6	3	3	2	0	1	0
0.242	82	5.9	1.17	0.52	6th	18	2	2	2	1	0	1	5	7	4	4	3	1	1	3	2
0.242	82	6.3	1.45	0.34	28th	13	0	1	1	7	11	0	13	4	2	3	4	1	0	2	1
0.236	86	7.4	1.81	0.32	1st	17	0	2	0	4	16	1	9	4	2	3	3	1	3	5	0
0.235	83	6.5	1.54	0.39	6th	12	0	1	0	7	14	0	3	11	3	2	4	3	1	2	1
0.227	76	6.6	1.13	0.34	6th	13	0	2	1	4	12	2	4	8	5	3	3	2	2	1	2
0.244	79	4.1	1.57	0.36	6th	17	1	4	0	10	2	1	4	9	8	1	4	2	1	1	0
0.255	88	5.5	1.50	0.39	26th	11	0	0	0	7	4	2	3	13	5	2	3	2	0	2	0
0.255	88	6.7	0.83	0.27	2nd	10	0	0	1	8	15	0	0	9	10	2	2	0	1	3	3
0.218	88	5.8	2.26	0.34	1st	22	1	0	1	7	10	0	6	5	9	1	2	5	0	1	1
0.234	84	5.8	1.05	0.21	2nd	12	0	0	1	6	8	0	7	11	3	5	2	0	0	2	0
0.224	76	5.7	1.03	0.29	3rd	15	0	0	1	8	7	0	3	5	6	10	2	2	1	0	1
to death of Observer.																					
0.251	84	6.3	2.46	1.30	4th	11	0	0	0	6	11	0	3	5	11	5	3	2	0	0	1
0.257	84	4.9	1.40	0.55	26th	11	0	0	0	8	8	1	5	11	3	2	3	1	2	1	2
0.253	85	6.2	1.09	0.26	4th	9	0	0	0	7	9	1	1	5	6	6	6	1	3	1	1
0.244	83	6.9	1.72	0.43	27th	13	0	3	1	2	3	1	1	5	8	7	3	2	2	0	2
0.226	82	5.0	1.57	0.42	25th	10	0	0	1	11	10	0	6	2	4	5	3	2	1	0	7
0.271	84	7.3	2.66	0.56	1st	20	0	0	0	2	11	2	3	6	6	6	1	3	0	2	3
0.267	84	5.5	2.35	0.96	4th	16	0	0	0	5	6	0	7	4	3	7	4	3	0	2	0
0.283	85	7.6	1.69	0.32	3rd	14	0	0	0	2	13	4	2	7	8	3	5	2	2	1	0
0.270	87	6.2	1.75	0.43	27th	10	0	0	0	7	12	3	1	12	4	5	1	0	5	2	0

barometric readings at this station are not corrected for altitude.

TABLE VIII.

OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of April 1884.

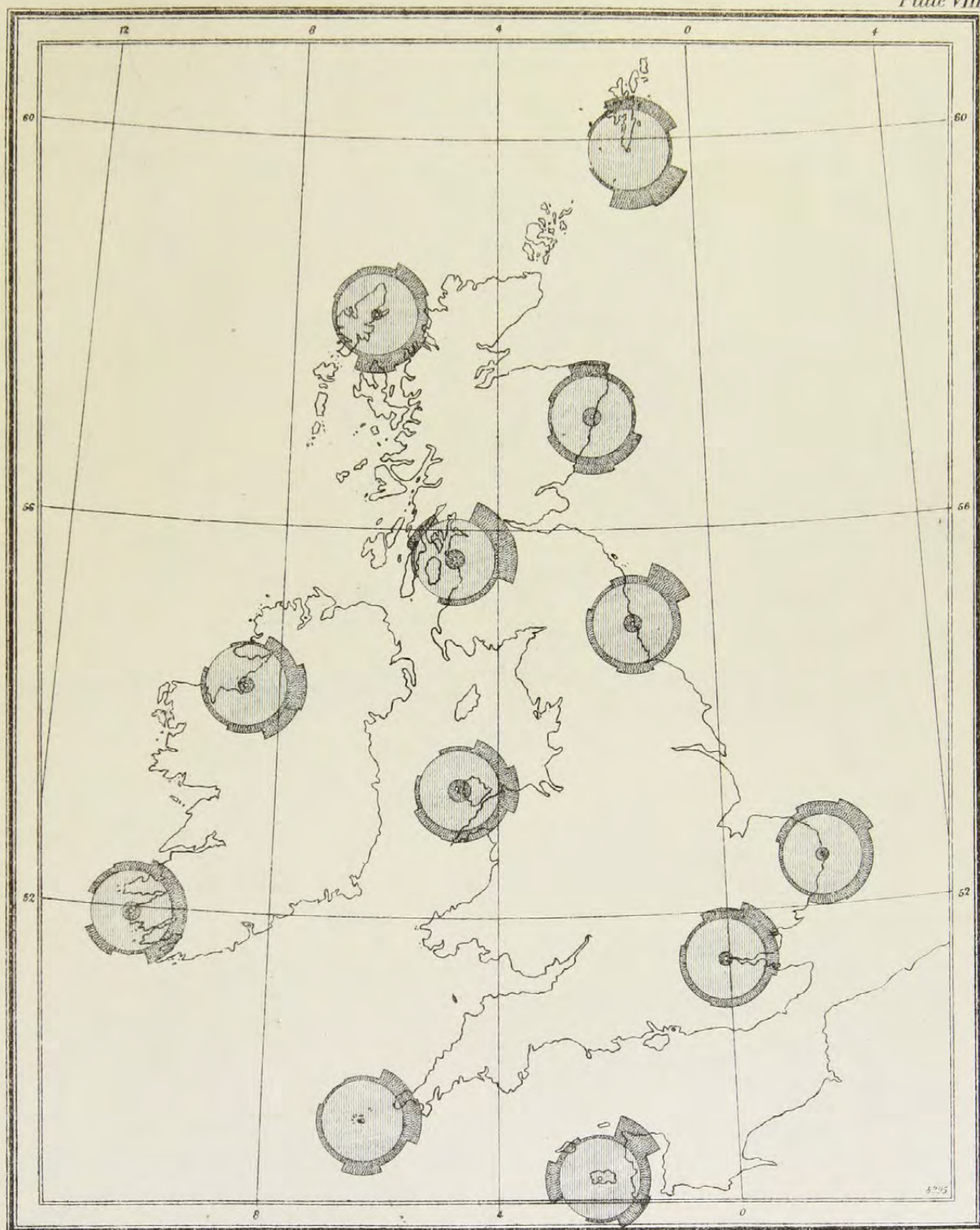
STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per- centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Mini- mum.	Date.	Maxi- mum.	Date.			
STORNOWAY	*	*	*	*	*	*	*	*	129	30
ABERDEEN	*	*	*	*	*	*	*	*	134	32
ALNWICK CASTLE	37°6	47°1	42°4	28	25th, 26th	56	4th, 6th	2°12	—	—
DURHAM	†	†	†	†	†	†	†	†	†	†
SCARBOROUGH	40°3	48°8	44°6	35	20th, 23rd, 24th, 26th.	58	6th	1°83	—	—
YORK	*	*	*	*	*	*	*	*	126	30
HILLINGTON	35°9	53°6	44°8	25	26th	69	2nd	1°43	145	35
GELDESTON	37°9	51°5	44°7	28	24th	65	2nd	1°47	145	35
CAMBRIDGE	*	*	*	*	*	*	*	*	111	27
ROTHAMSTED	35°3	51°7	43°5	25	23rd	66	2nd	1°79	—	—
BAWTRY	36°0	53°9	45°0	22	24th	67	3rd	1°34	—	—
LEICESTER	38°3	53°5	45°9	26	23rd	68	3rd	1°73	90	22
BIRMINGHAM	36°6	51°5	44°1	29	22nd, 23rd, 24th.	64	3rd	1°69	—	—
CHEADLE	36°1	50°7	43°4	29	18th, 23rd	62	3rd	1°63	—	—
CHURCHSTOKE	35°5	50°9	43°2	27	23rd	61	8th	1°02	121	29
HEREFORD	37°2	53°4	45°3	26	23rd	62	8th	1°33	—	—
CIRENCESTER	35°4	50°8	43°1	25	23rd	60	3rd	1°42	102	25
OXFORD	*	*	*	*	*	*	*	*	104	25
LONDON	*	*	*	*	*	*	*	*	86	21
MARLBOROUGH	35°6	51°0	43°3	23	23rd	61	3rd	1°50	102	25
STRATHFIELD TURGISS	35°6	54°2	44°9	23	23rd	66	2nd	1°64	—	—
HASTINGS	40°6	52°1	46°4	33	24th	59	2nd, 3rd	2°02	134	33
SOUTHAMPTON	37°8	53°8	45°8	29	23rd	63	8th	1°67	115	28
LAUDALE	39°9	52°1	46°0	33	18th	60	10th	2°92	—	—
GLASGOW	39°0	51°2	45°1	34	26th, 27th	58	15th	1°15	100	24
SILLOTH	38°0	52°8	45°4	31	25th	62	3rd	1°26	130	31
DOUGLAS	38°9	50°3	44°6	31	26th	57	9th	1°46	169	41
NEWTON REIGNY	35°4	50°1	42°8	27	25th	62	3rd	1°46	129	31
STONYHURST	37°0	52°1	44°6	30	10th, 18th	62	3rd	1°01	125	30
BLACKPOOL	36°3	51°6	44°0	28	18th	63	3rd	1°28	120	29
MANCHESTER	36°4	51°1	43°8	29	18th, 23rd	63	3rd	0°82	—	—
LLANDUDNO	39°7	50°6	45°2	31	18th	58	5th	1°19	162	39
PEMBROKE	*	*	*	*	*	*	*	*	177	43
ARLINGTON	36°2	50°1	43°2	29	22nd, 24th	57	9th	2°42	—	—
CULLOMPTON	36°2	52°0	44°1	25	23rd	60	7th	2°16	120	29
FALMOUTH	43°1	50°3	46°7	36	18th	56	7th, 9th	1°94	165	40
PLYMOUTH	39°6	53°1	46°4	31	19th	61	9th	1°72	155	38
JERSEY	*	*	*	*	*	*	*	*	176	43
LONDONDERRY	38°3	54°6	46°5	32	1st	64	9th	1°40	—	—
MARKREE CASTLE	36°2	54°0	45°1	28	21st	60	10th	1°24	153	37
BROOKEBOROUGH	36°4	53°3	44°9	29	8th	62	9th	1°58	—	—
ARMAGH	37°7	52°3	45°0	31	25th	58	9th	2°00	141	34
DUBLIN	40°4	52°4	46°4	34	1st	59	7th	1°53	180	44
PARSONSTOWN	*	*	*	*	*	*	*	*	169	41
KILKENNY CASTLE	38°3	57°5	47°9	30	23rd	66	10th	1°19	—	—
WATERFORD	38°4	53°7	46°1	31	23rd, 24th	59	9th	1°71	—	—
VALENCIA	*	*	*	*	*	*	*	*	152	37
FOYNES	37°7	53°7	45°7	32	18th	60	10th	1°39	—	—

* Information found in Table VIII.

† Records incomplete.

MONTHLY WIND CHART FOR APRIL 1884.

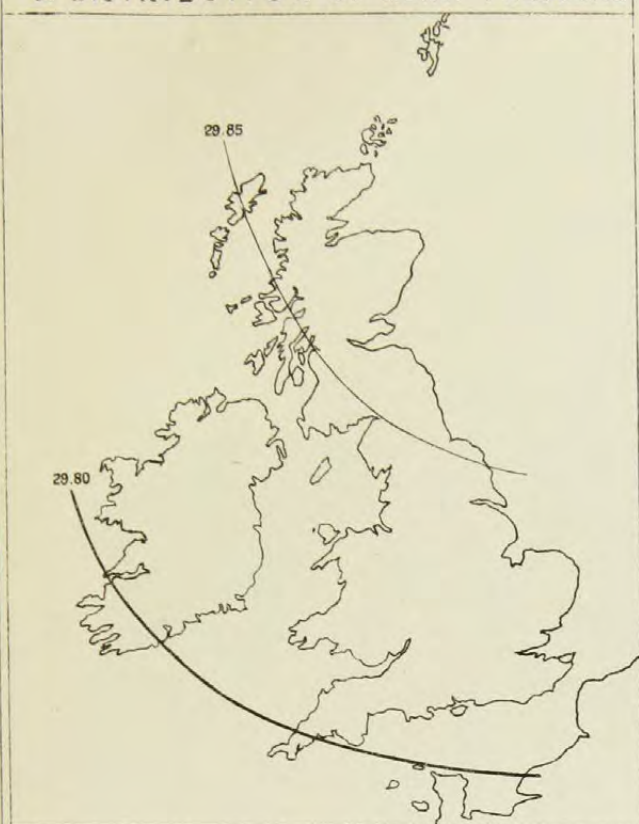
Plate VIII



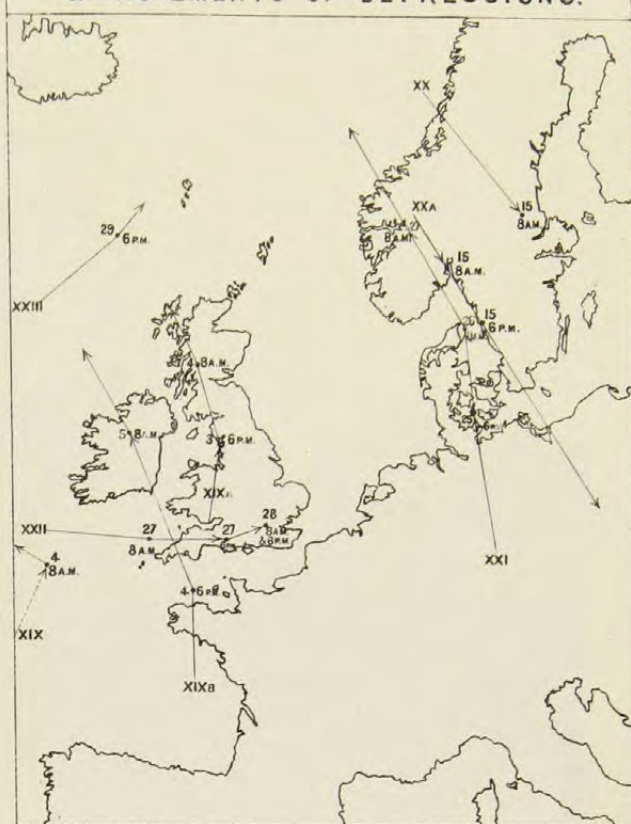
To face p. 48.

DANGERFIELD LITH. 22 BEDFORD ST. COVENT GARDEN.

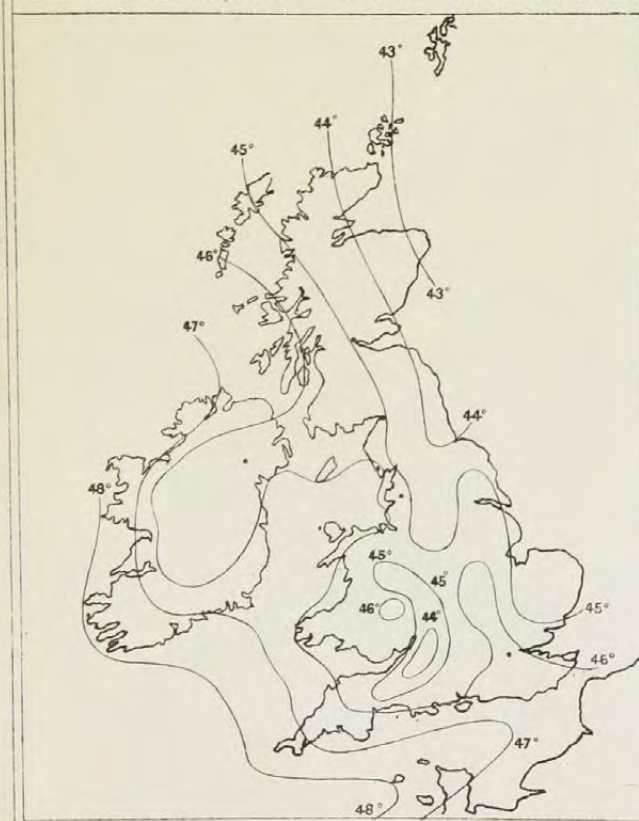
1. DISTRIBUTION OF MEAN PRESSURE



2. MOVEMENTS OF DEPRESSIONS.



3. DISTRIBUTION OF MEAN TEMPERATURE.



4. RAINFALL



MONTHLY WEATHER REPORT.

MAY 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather experienced over the British Islands during May was of two distinct kinds : (1) cyclonic, extending from the 1st to the 19th ; (2) anticyclonic, from the 20th to the end of the month. In the former period the distribution of pressure was very varied, sometimes complex, and several depressions passed over the northern and north-western parts of the kingdom. Showers occurred frequently separated by bright intervals in the east and south, much rain fell in Scotland and the north of Ireland, and thunderstorms prevailed locally. Temperature, which was occasionally rather high over England, varied greatly as the Southerly and North-westerly currents of wind alternately prevailed, and, except in the south and east, bright sunshine was very deficient. In the latter period the thermometer was low—especially during some of the clearer nights—the air was dry and searching, the winds were light, being chiefly Easterly or North-easterly in direction, and no cyclonic system of importance showed itself near our coasts. Pressure was high generally, and its range was very small over our southern counties. On the 31st the anticyclonic conditions appeared to be breaking up.

May 1-6.—During this period the distribution of pressure over north-western Europe was of a complex character. At first two high-pressure areas were observed, one over northern Europe, the other over Spain, while the lowest readings were reported from our north-west coasts. Some well-marked low-pressure systems passed along to the north-westward of Scotland about parallel to the direction of the broken arrow marked "A" on Map 2 Plate XI., and some shallow local disturbances were developed over the United Kingdom in the "hollow" of low pressure which separated the two anticyclones referred to above. Under these circumstances unsettled, cool, cloudy, showery weather was experienced over our Islands generally, and thunderstorms prevailed in several places. The winds varied in direction, from West or South-west at our own stations to South-east and East in Norway, the former blowing strongly at times and exhibiting a tendency to "veer" rather than to "back." On May 4th depression No. XXXIV.* came over Scotland from the north-westward, and as it passed south-eastwards to the North Sea the wind on our coasts veered to North-west and temperature fell, but the weather so far from clearing remained showery, and severe thunderstorms occurred locally—notably over the south-east of England on the 5th. (See the Daily and Weekly Weather Reports for this time.)

May 7-11.—The high-pressure area over northern Europe now gave way, while a well-formed anticyclone (No. VIII., p. 53) appeared over France; the barometer fell again at our western and north-western stations, and the cyclonic system No. XXXV.,* appeared off our northern coasts. The wind soon backed to the South-westward (though varying somewhat in Scotland), temperature rose, and the weather began to improve over the southern and eastern counties of England, but it continued dull and showery for a time over the western and northern parts of the kingdom. The 10th and 11th were very fine over

* See Section II., and Map 2 Plate XI., for the history and tracks of depressions.

England, and a great improvement was observed in Ireland and Scotland, for, as the depressions in the north broke up, the anticyclone over France extended northwards, in a ridge, which spread over our eastern counties and the North Sea to Norway. The wind over the British Islands backed to the Southward and fell very light, the sky cleared, and the daily maximum temperatures on the 11th were as high as 83° at Bawtry, 80° at Newton Reigny, and 78° or 79° at most of our other inland stations.

May 12-14 was another changeable, unsettled, and thundery period, in which a second, but small, subsidiary anticyclone appeared off our south-western coasts, between which and the larger system over Germany, Denmark, and Scandinavia, there was a mingling of North-westerly and Southerly winds, which soon produced heavy showers and local thunderstorms, the thermometer falling fast. It was during this time that the peculiarly shaped depression No. XXXVI.* passed over the country.

May 15-19.—Pressure was now highest in an anticyclone (No. IX., p. 53) which lay over France, and lowest to the northward and north-westward of the United Kingdom. Fine warm weather prevailed at all our southern stations, but in Scotland and the north of Ireland two depressions (Nos. XXXVII. and XXXIII.*) kept the weather in a squally, rainy condition, so that during the week which ended on the 19th the excess of rain in the north and north-west amounted to 2·3 inches at Stornoway, 9·3 inch at Wick and Sumburgh Head, 0·6 inch at Silloth and Donaghadee, and 0·7 inch at Armagh, while over nearly the whole of England there was a marked deficit, and over our southern counties the total fall amounted to only a few hundredths of an inch. (See the Weekly Weather Report, p. 80.)

May 20-30.—A high-pressure area now appeared in the south-west, and, moving north-eastwards, spread over the whole of north-western Europe. Anticyclonic conditions, therefore, became general, and were experienced until the end of the month (see Nos. X. and XI. in the Table of Anticyclonic Systems, p. 53). As this change was effected the wind over our Islands fell very light, and backed round from North-west, first to the southward, and then to the eastward; temperature decreased, so that, although the sun's rays were warm, the air was dry and searching, the nights were keen, and sharp frosts occurred on the grass. By the 22nd the centre of the anticyclone No. X. had reached North Germany, whence a ridge extended westwards over the North Sea and our Islands, causing Easterly breezes to prevail in the south, and Southerly airs in the north. Pressure then gave way over Scandinavia and the Baltic, while it increased over the United Kingdom, and the result was that the 24th found a new anticyclonic centre over our northern districts (see No. XI., p. 53), which did away with the Southerly breezes recently prevailing there, and caused the cold, dry, Easterly wind to spread all over the kingdom. Vegetation began to suffer greatly, both from the cold wind and from want of rain. The only stations at which there was not an actual deficit of rain in the week ending on the 26th were Hurst Castle, Pembroke, and Waterford. The eastern, northern, and north-western counties of England were rainless. During the remainder of the month the movements of this system were slight and irregular, and it was not until near its close that any signs of its giving way were observed. The barometer then began to fall somewhat generally, and on the 31st the anticyclone was moving decidedly in a southerly direction, causing Westerly breezes to appear at our extreme northern stations.

* See Section II., and Map 2 Plate XI., for the history and tracks of depressions.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—MAY, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XXXIV. May 4-6.	No. XXXV. May 7-8.
Form - - - - -	Somewhat complex at first, having two minima, one of which quickly filled up. Nearly circular on 5th.	Apparently nearly circular.
Size - - - - -	Moderate - - - - -	Large at first, then moderate to small.
Depth - - - - -	Moderate; gradients steepest on its south-western and southern sides.	Moderate to shallow.
Where first Observed - - -	Approaching the north of Scotland - - -	Off the west of Ireland.
Direction of Motion - - - -	South-easterly till evening of 4th, then north-easterly	North-easterly.
Rate of Motion - - - - -	Slow to very slow - - - - -	Moderate.
Regions passed over by Steepest Gradients	Ireland and England - - - - -	The British Islands, North Sea, and western Norway.
Termination - - - - -	Broke up over Norway - - - - -	Filled up off the west of Norway.
Time under Observation - - -	Three days - - - - -	Nearly two days.
Accompanying Winds - - - -	Strong Westerly and North-westerly at first, then falling light and veering.	South-westerly to Westerly, strong; a gale in exposed places.
" Weather - - - - -	Cold showers of rain and hail, with thunder and lightning locally.	Squally and showery, but mild.
" Rainfall - - - - -	Greatest over the northern and eastern parts of the kingdom, but not heavy anywhere.	Greatest in the west and north, slight in the south-eastern half of England.
REMARKS - - - - -	<p>This depression advanced when the area of highest pressure lay over the Spanish peninsula and another area of rather high pressure lay over northern Europe.</p> <p>Its movement changed very suddenly from a south-easterly to a north-easterly direction during the night of the 4th, from which time its rate of motion slackened and the depression began to fill up.</p>	<p>This depression advanced to our coasts when pressure was highest over the peninsula and west of France, lowest in the north-west of Norway, the gradients being slight.</p>

SECTION II.—*continued.*TABLE OF CYCLONIC SYSTEMS.—MAY, 1884—*continued.*

NATURE OF CHARACTERISTICS OBSERVED.	No. XXXVI. May 13-14.	No. XXXVII. May 15-16.	No. XXXVIII. May 17-18.
Form - - - - -	Apparently circular at first, then elongated and variable.	Apparently circular - - - -	Somewhat oval.
Size - - - - -	Moderate - - - - -	Large - - - - -	Moderate.
Depth - - - - -	Moderate - - - - -	Moderate - - - - -	Shallow.
Where first Observed - -	Off the north-west of Ireland - -	Very near the Faroe Islands - -	Off the west of Scotland.
Direction of Motion - -	North-easterly - - - - -	North-easterly - - - - -	North-easterly.
Rate of Motion - - - -	Moderate to slow - - - -	Slow - - - - -	Slow to moderate.
Regions passed over by Steepest Gradients.	The British Islands generally - -	The British Islands - - - -	The western and northern parts of our Islands.
Termination - - - - -	Travelled north-eastward up the Norwegian coast, and apparently filled up.	Travelled away to the north-eastward	Travelled away north-eastwards over Norway.
Time under observation - -	One day - - - - -	About 36 hours - - - - -	Nearly 2 days.
Accompanying Winds - -	Southerly and South-westerly, fresh; subsequently changing to North-westerly, strong.	South-westerly to Westerly, strong; a gale at some northern stations.	Strong South-south-westerly at first at our western and north-western stations; then veering to West and North-west in Scotland.
" Weather - - - - -	Showery in the west and north; fair in the south-east.	Showery and squally, more especially in the west and north.	Rainy in the west and north; a few local showers elsewhere.
" Rainfall - - - - -	Rather heavy in the south of Ireland, slight elsewhere.	Slight in most places, but more than half-an-inch at Mullaghmore.	Very heavy (1.9 in.) at Sumburgh Head; slight elsewhere.
REMARKS - - - - -	<p>This depression came on when pressure was highest in the south of France, whence a "ridge" extended northwards over the Channel and England.</p> <p>In the middle of this ridge there was a singularly shallow but well-marked depression, and it is to this that the rain at our southern stations and the thunderstorms in France on the 13th appear to have been due.</p> <p>The depression developed a very decided subsidiary system on its southern side as it passed over. See the Weekly and Daily Reports for this date.</p>	<p>This depression came on when pressure was highest over the peninsula and lowest to the northward of Scotland.</p> <p>It followed closely on No. XXXVI., and was accompanied by some very small and shallow subsidiary disturbances over our Islands, and developed some more decided ones over the northern parts of the North Sea.</p>	<p>This disturbance appeared when pressure was highest in the extreme south-east of our area and lowest in the north-west, the gradients being moderate.</p> <p>It developed shallow subsidiary disturbances on its southern side, but they brought very little rain with them.</p>

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS.—MAY, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. VIII. May 7-10.	No. IX. May 15-16.	No. X. May 20-23.	No. XI. May 24-31.
Form - - - -	Oval - - - -	Oval - - - -	Somewhat oval at first, but very irregular and variable.	Uncertain; portions visible elongated like a ridge (see remarks below).
Size - - - -	Small at first, then large -	Small - - - -	Large - - - -	Large.
Height - - - -	Small - - - -	Small - - - -	Small - - - -	Small.
Where first observed -	Off the south-west of France -	Off the south-west of France.	To the south-westward of our Islands.	Over Scotland and the adjacent parts of the North Sea.
Direction of Motion -	Easterly and north-easterly -	Easterly - - - -	Eastwards and north-eastwards.	Very irregular.
Rate of Motion - -	Very slow - - - -	Very slow - - - -	Slow - - - -	Very slow.
Regions passed over -	France and Germany - -	France - - - -	The southern parts of our Islands, the north of France, and north Germany.	The British Isles and North Sea.
Termination - - -	Developed into a large high-pressure system, and finally passed away over Russia on 13th.	Travelled eastwards to Switzerland and Austria.	Moved south-eastwards to Austria on 24th, and passed away from our area.	Moved southwards on 31st, and dispersed.
Accompanying Wind -	Westerly and South-westerly over our Islands.	Calms and variable airs over southern Europe; South-westerly breezes in our Islands.	Very light and variable near its centre. Easterly breezes appearing over our southern counties on the 22nd.	Northerly and Easterly; light in the north, fresh in the south.
Weather -	Very fine in France; cloudy and showery with us.	Very fine over southern Europe; cloudy and showery over the British Isles.	Fine and dry; hazy.	Very cold and dry; gloomy and hazy at times. Much rain and some thunder in west of France between 27th and 31st.
REMARKS - - -	The form of this system was much modified after it reached Germany, an arm or "ridge" being thrown northwards from it on the 11th as far as to the north-west of Norway.	This system increased greatly in size as it advanced eastwards.	As this system passed away anticyclone No. XI. was developed over our northern districts.	By the 26th the central portion of this system had reached the North Sea near Aberdeen, on the 27th it covered all the northern portion of the United Kingdom. The system then receded a little to the northward, and, after showing some signs of breaking up on the 29th and 30th, travelled suddenly in a southerly direction on the 31st, causing Westerly breezes to appear in the far north.

SECTION III.

REMARKS FOR MAY 1884.

(Tables IX. and X., and Plates X. and XI.)

Pressure.—The mean pressure at 8 a.m. varied from 30·02 inches over the south-eastern counties of England, and 29·96 inches over the extreme south-east of Ireland, to 29·80 inches at Wick, 29·78 inches at Stornoway, and to 29·76 inches at Sumburgh Head. These readings are slightly higher over our south-eastern counties, but are rather lower in the north and north-west than the normal values for this time of year; the resulting gradients agree with those shown by the normal values in being favourable for South-westerly breezes, but are somewhat the steeper of the two. Over the northern parts of the kingdom the highest readings were registered on the 26th, while the anticyclone No. XI. was lying over the North Sea and the northern and eastern parts of our Islands, but at the more southern stations the highest values were recorded on the 21st, when anticyclone No. X. lay over the Channel, the north of France, and the southern counties of England. The maximum values recorded did not exceed 30·45 inches in any part of the kingdom. The lowest pressures occurred between the 2nd and 4th, when the mercury sank below 29 inches at all our northern stations and to a little below 29·5 inches even on the south coast of England. Thus the range during the month was much greater over our northern than over our southern districts, but was not excessive anywhere.

Movements of Depressions.—Nearly all the principal depressions observed moved from west-south-west to east-north-east, their tracks lying over the northern portions of our area, but during the earlier portion of the month subsidiary disturbances frequently spread southwards over Ireland and England, and produced thundery, showery weather in many places. The movements of one of the depressions (No. XXXIV.*) are worthy of particular notice. The system advanced briskly towards Scotland from the north-westward early on the 4th, its centre at 8 a.m. being a little to the south-eastward of Nairn. It then moved in a more easterly direction, and at 6 p.m. was about 150 miles to the eastward of St. Andrews (Fife); its next movement was in a north-easterly direction, the centre reaching the south-west of Norway early on the 5th, after which its rate of motion slackened and the system broke up not far from Lillehamer on the evening of the 6th. The whole of the depressions observed came over us between the 1st and 17th of the month, after which anticyclonic conditions prevailed continuously.

Anticyclones.—These were well marked, although the pressure in them was never very high. The first well-defined system which came within our area appeared near Biarritz on the 7th, whence it moved north-eastwards to Germany by the 10th, and covered a much more extensive area than it did at its first appearance. (See Table of Anticyclonic Systems, page 53.) A new but subsidiary (small) anticyclone appeared off our south-western coasts early on the 12th, and, passing north-eastwards, disappeared to the eastward of the North Sea. (See the synchronous maps in the Weekly Weather Reports.) Another larger system advanced over France from the Atlantic on the 16th, and between this date and the end of the month, our Islands were constantly under the influence of one or more of such systems. While they lay over the more northern parts of our area, cold, searching, Easterly winds were felt over the United Kingdom, and as these lulled, sharp night frosts were experienced, especially over our inland counties, causing both the fruit crops and flowers to suffer greatly from drought and cold.

Winds.—These varied greatly, so far as their direction is concerned, especially during the first half of the month, but in the latter portion they were chiefly Easterly to Northerly, especially over England, and at times blew rather strongly in the Channel. It

* See Section II. and Map 2 Plate XI., for the history and tracks of depressions.

will be seen on examining the Monthly Wind Chart, Plate X., that at all stations the petals of the wind roses show a well-marked prevalence of wind from the South-westward, though an almost equal prevalence of wind from North-east is shown at our eastern and south-eastern stations and from East in the south-west and west. Their forces were, however, low. The number of gales experienced was small except in the extreme west of Ireland and at Stornoway, where the Southerly and South-westerly winds experienced during the earlier part of the month occasionally blew hard. At Nairn and Parsonstown the "calms" reported were especially numerous.

Temperature.—The mean (sea level) temperature of May varied from a little above 55° in the neighbourhood of London and 54° over Devonshire, to about 50° over central Scotland, 47° in the Hebrides, and to 45° in the south of the Shetlands. In Ireland the values ranged from about 52° over the south-eastern, to 51° over the north-western parts of the country. Thus there was an advance since the previous month of 9° near London, of 7° over the north of England, 4° to 7° in Ireland, 5° over Scotland, and about 3° in the Hebrides and Shetlands. Compared with the average values for the corresponding month in the 20 years, 1861–80, it appears that the temperature of May this year was very slightly in excess over Great Britain, and equally slightly in defect over Ireland. The summer type of distribution (viz., warm inland and relatively cold coast stations) was well developed, our midland counties being about 2° warmer than our east coast, and 3° warmer than the eastern shores of the Irish Sea.

The highest temperatures recorded during the month occurred on the 23rd or 24th in almost all parts of the kingdom, at which time the western portion of anticyclone No. X. was extended over us. At stations in the north of England, however, and at Jersey the maximum occurred on the 11th, and on our east coast on the 17th. These latter were the results of purely local conditions. The lowest temperatures ranged from 31° to 35° at the inland stations, and were recorded (as a rule) over the eastern half of England on the 1st, in Scotland between the 4th and 7th, in the north-west of England and north of Ireland on the 19th, in Wales and the south-east of Ireland on the 21st. The range of temperature was large over England, amounting to 51° at Strathfield Turgiss and 45° to 47° in many other places.

Vapour Tension varied from about a quarter of an inch of mercurial pressure in the northern counties of Nairn and Aberdeen to $0\cdot30$ inch over the east parts of Ireland and the southern counties of England, and to $0\cdot34$ inch in the south of Ireland; while *Relative Humidity* ranged from between 70 and 75 per cent. over the inland parts of England to between 80 and 85 per cent. at the coast stations.

Rainfall was deficient except at a few stations on our extreme south-western, north-western, and northern coasts. At the south-eastern and eastern stations the amounts measured were very small, being only $0\cdot4$ inch at Hastings, and $0\cdot6$ inch at Dover, Cambridge, Spurn Head, and Shields. On Dartmoor only 1 inch fell, but Glasgow had $2\cdot8$ inches, Valencia, Mullaghmore, and Londonderry 3 inches to $3\cdot5$ inches, Stornoway $4\cdot9$ inches, and Laudale $5\cdot3$ inches. The largest falls on any one day were $1\cdot88$ at Stornoway on the 17th, $1\cdot20$ inches at Hawes Junction on the 15th, $0\cdot76$ inches at Scilly on the 27th, and $0\cdot71$ in Valencia on the 8th. The number of days of rain varied from 6 at Shields, and from between 8 and 10 over our eastern counties generally, to 19 at Parsonstown and 24 at Stornoway.

Bright Sunshine.—The proportion of the possible duration of bright sunshine which was actually registered varied from between 27 and 32 per cent. in the north of Ireland, and from 28 to 37 per cent. over some of the north-western parts of Great Britain, to between 47 and 49 per cent. over portions of our southern and eastern counties, and to 57 per cent. at Jersey.

TABLE IX.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
Observations are made at 8 a.m. daily, but the Numbers of Days of Rain, Snow, Hail,
(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head - - -	ins. 29° 764	45° 9	39° 9	50° 0	45° 0	34	4th, 7th	55	12th, 22nd, 23rd
	Wick - - -	29° 798	48° 6	40° 6	54° 6	47° 6	30	4th	68	23rd
	Stornoway - - -	29° 784	47° 5	40° 3	52° 9	46° 6	33	2nd	65	23rd
1. SCOTLAND, E.	Nairn - - -	29° 814	48° 5	41° 5	56° 5	49° 0	30	4th	71	23rd
	Aberdeen - - -	29° 841	50° 1	41° 5	56° 4	49° 0	29	7th	73	22nd
	Leith - - -	29° 869	49° 4	41° 7	57° 2	49° 5	35	2nd, 7th, 19th	70	22nd
2. ENGLAND, N.E.	Shields - - -	29° 908	51° 3	44° 1	57° 2	50° 7	35	7th	70	11th
	York - - -	29° 960	51° 3	42° 5	61° 7	52° 1	34	7th, 19th	78	11th
	Spurn Head - - -	29° 956	50° 9	46° 2	56° 3	51° 3	40	1st, 4th, 5th, 7th.	68	17th
3. ENGLAND, E.	Yarmouth - - -	29° 986	52° 4	46° 2	57° 9	52° 1	35	1st	70	10th, 16th, 17th
	Cambridge - - -	29° 999	54° 1	41° 9	65° 1	53° 5	32	1st	81	24th
4. MIDLAND COUNTIES	Loughborough - - -	29° 984	52° 1	43° 3	63° 4	53° 4	32	21st	80	23rd
	Oxford - - -	30° 013	52° 0	44° 3	62° 3	53° 3	37	1st, 6th	79	24th
5. ENGLAND, S.	London - - -	30° 023	54° 2	45° 7	64° 4	55° 1	35	1st	81	24th
	Dover - - -	30° 011	55° 0	48° 5	59° 1	53° 8	41	1st	70	23rd, 24th
	Hurst Castle - - -	30° 022	52° 4	46° 5	60° 6	53° 6	40	6th, 21st, 22nd	72	24th
6. SCOTLAND, W.	Ardrossan - - -	29° 870	49° 0	43° 1	55° 8	49° 5	35	7th	69	24th
7. ENGLAND, N.W.	Hawes Junction* - - -	28° 712	46° 4	38° 4	53° 5	46° 0	30	27th	72	11th
	Barrow-in-Furness - - -	29° 923	48° 9	45° 4	57° 1	51° 3	40	2nd	72	23rd, 24th
	Liverpool - - -	29° 950	51° 0	45° 8	60° 3	53° 1	38	7th	79	11th
	Holyhead - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	Observer dead
8. ENGLAND, S.W.	Pembroke - - -	29° 976	50° 5	47° 0	54° 6	50° 8	40	4th	60	23rd, 24th
	Prawle Point - - -	29° 027	52° 0	45° 2	57° 3	51° 3	40	1st, 4th, 6th, 8th, 19th.	70	24th
9. IRELAND, N.	Donaghadee - - -	29° 902	49° 5	42° 9	56° 5	49° 7	33	7th	65	9th
	Mullaghmore - - -	29° 858	50° 6	46° 9	56° 8	51° 9	38	8th	68	24th, 28th
10. IRELAND, S.	Parsonstown - - -	29° 926	50° 6	43° 0	60° 0	51° 5	34	20th	75	24th
	Valencia - - -	29° 930	53° 9	47° 2	58° 6	52° 9	36	7th	74	24th
	Roche's Point - - -	29° 961	52° 4	46° 8	57° 8	52° 3	40	4th	67	24th
CHANNEL ISLANDS	Seilly (St. Mary's) - - -	30° 000	53° 2	48° 3	56° 8	52° 6	42	29th	62	22nd, 24th, 25th.
	Jersey (Noirmont) - - -	30° 031	53° 8	48° 5	60° 7	54° 6	42	1st, 2nd	75	11th

* Hawes Junction is 1,135 feet above Mean Sea Level and the

TABLE IX.

REPORTING STATIONS in the BRITISH ISLANDS, during the Month of May 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred.

beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calm.
ins.	°/100	7.6	ins.	ins.	7th	20	0	0	0	1	11	1	5	6	1	2	4	1	9	3	0
264	80	7.1	3.29	0.44	16th	17	2	2	0	4	14	4	4	1	2	1	5	3	6	6	3
280	82	7.3	2.04	0.30	17th	24	0	5	1	4	12	9	3	4	3	4	6	4	3	2	2
274	83	6.0	4.94	1.88	1st	14	1	2	0	7	9	2	0	0	2	0	0	6	9	3	11
265	77	5.4	1.42	0.25	14th	13	0	3	1	11	11	3	4	2	2	1	6	9	3	4	0
277	77	6.1	2.33	0.72	8th	15	2	2	1	4	9	2	0	2	2	3	0	4	11	4	5
274	78	7.2	0.62	0.26	4th	6	0	1	1	4	14	2	1	4	3	0	1	11	7	1	3
271	72	5.8	1.09	0.23	5th	10	0	0	0	10	13	0	4	5	2	0	4	9	5	2	0
278	73	3.9	0.59	0.15	2nd	10	1	1	2	13	2	2	2	7	2	1	3	8	6	2	0
312	85	4.3	0.92	0.21	6th	12	0	1	3	10	2	2	2	8	2	0	2	6	7	3	1
312	79	4.5	1.04	0.30	2nd	10	0	0	4	15	10	0	4	5	4	0	2	12	2	1	1
307	74	5.7	0.84	0.43	2nd	9	0	1	1	6	8	6	1	7	3	2	1	7	7	3	0
288	74	5.0	0.76	0.26	12th	9	0	1	1	14	10	2	4	7	2	0	4	10	3	1	0
294	76	5.8	0.68	0.20	5th	10	0	2	3	6	9	1	1	5	6	3	1	11	3	1	0
297	71	3.7	0.62	0.17	19th	8	0	1	1	13	4	0	2	5	8	0	0	4	9	2	1
316	73	4.5	1.23	0.49	24th	11	0	1	0	10	2	5	2	8	6	1	1	3	9	1	0
323	82	6.6	2.22	0.40	8th	19	0	3	1	9	16	3	1	4	4	2	6	7	3	1	3
298	86	6.0	5.60	1.20	15th	15	1	1	0	11	15	1	1	1	5	1	6	10	7	0	0
252	81	6.0	1.67	0.41	8th	0	0	0	0	10	14	5	0	9	3	2	5	7	2	3	0
286	83	5.1	1.15	0.26	14th	7	0	0	0	10	7	0	0	1	7	6	3	8	5	1	0
278	73	records incomplete																			
295	81	6.5	1.38	0.53	24th	16	0	0	0	6	12	1	1	1	5	4	6	5	6	2	1
323	83	5.4	1.23	0.41	24th	11	0	3	1	11	11	3	3	8	4	1	1	7	5	2	0
302	86	6.2	2.31	0.53	18th	17	0	1	0	8	13	5	4	1	4	5	5	1	10	3	0
308	83	6.2	3.28	0.53	8th	17	0	3	0	8	8	11	1	1	7	2	1	12	4	2	1
298	81	6.0	2.08	0.36	24th	19	0	1	1	7	13	0	2	0	0	6	5	3	5	0	10
340	82	7.4	3.29	0.71	8th	17	0	1	0	4	17	9	1	1	3	3	4	7	3	4	5
335	85	6.6	1.05	0.50	13th	14	0	1	1	4	13	3	4	0	5	2	3	8	6	3	0
334	83	7.4	1.43	0.76	27th	11	0	0	0	3	17	5	1	2	7	0	4	8	4	5	0
347	83	4.7	1.05	0.37	3rd	14	0	2	2	12	8	4	2	5	8	3	0	5	6	1	1

Barometer readings at that station are not reduced to sea level.

TABLE X.

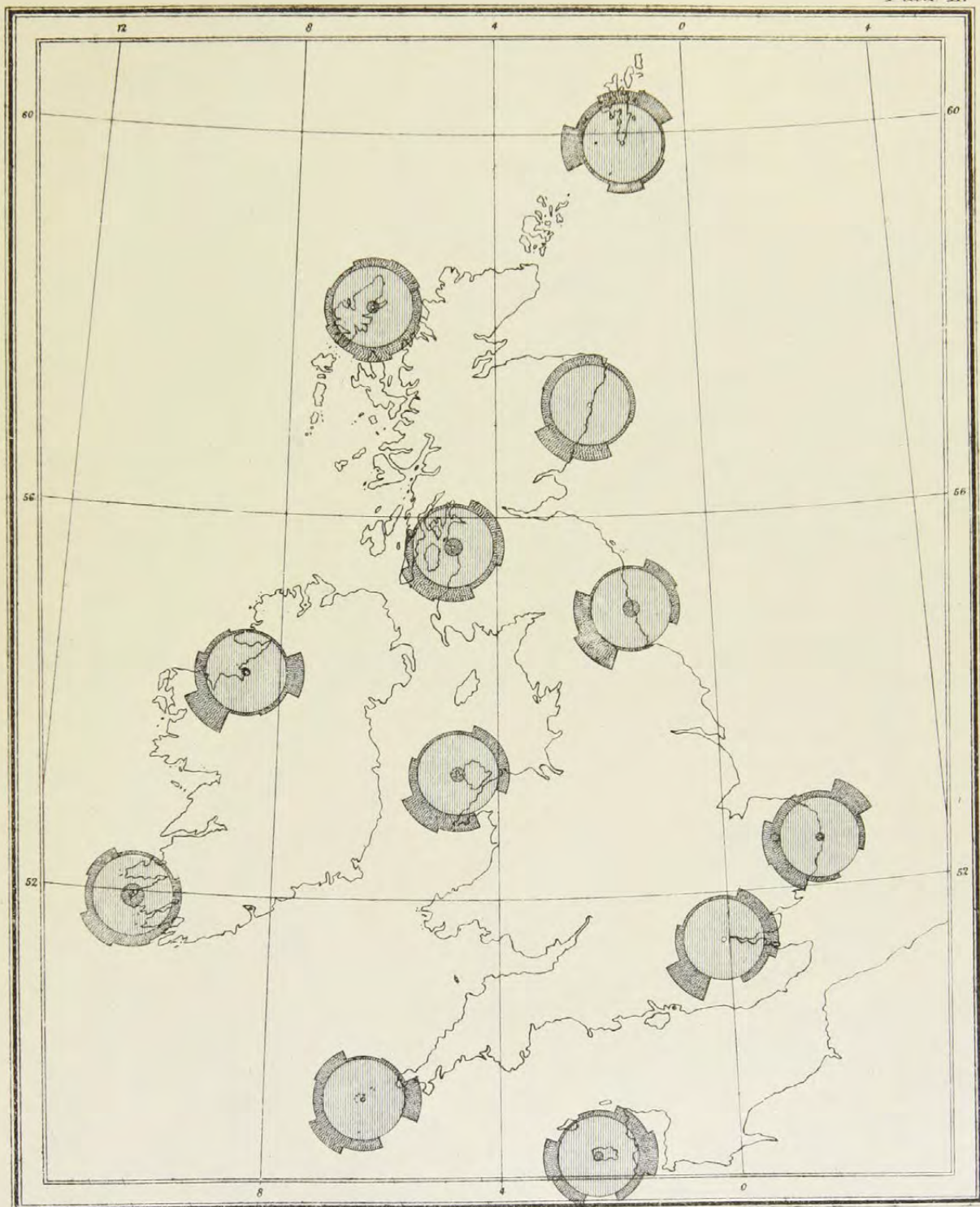
OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of May 1884.

STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per-centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Mini-mum.	Date.	Maxi-mum.	Date.			
STORNOWAY - -	*	*	*	*	*	*	*	*	188	37
ABERDEEN - -	*	*	*	*	*	*	*	*	169	34
ALNWICK CASTLE - -	42°6	55°1	48°9	32	6th	67	22nd	1°45	—	—
DURHAM - - -	40°0	60°1	50°1	33	7th, 19th	76	11th	0°67	193	39
SCARBOROUGH - -	44°7	57°6	51°2	37	2nd, 7th	73	11th	0°71	—	—
YORK - - -	*	*	*	*	*	*	*	*	210	43
HILLINGTON - -	42°5	63°1	52°8	31	7th	78	11th, 23rd	1°13	230	47
GELDESTON - -	43°7	61°0	52°4	34	1st	74	11th	1°36	235	49
CAMBRIDGE - -	*	*	*	*	*	*	*	*	231	48
ROTHAMSTED - -	42°0	62°7	52°4	32	21st	79	24th	0°64	—	—
BAWTRY - - -	42°3	63°9	53°1	34	6th, 20th, 26th, 27th.	83	11th	0°79	—	—
LEICESTER - -	43°5	63°4	53°5	35	1st, 5th, 21st	80	23rd	1°10	205	42
BIRMINGHAM (Oscott) -	42°7	61°3	52°0	35	1st, 5th	76	11th, 24th	0°63	—	—
CHEADLE - - -	43°1	58°9	51°0	34	1st	75	11th	1°41	—	—
CHURCHSTOKE - -	40°7	60°3	50°5	32	21st	77	11th	1°12	224	46
HEREFORD - - -	42°3	64°4	53°4	31	21st	78	11th, 24th	0°52	—	—
CIRENCESTER - -	41°6	60°4	51°0	31	21st	76	24th	0°99	197	41
OXFORD - - -	*	*	*	*	*	*	*	*	201	42
LONDON - - -	*	*	*	*	*	*	*	*	192	40
MARLBOROUGH - -	42°1	62°4	52°3	33	1st, 21st	78	24th	1°13	199	42
STRATHFIELD TURGISS -	41°8	65°2	53°5	32	1st	83	24th	0°74	—	—
HASTINGS - - -	47°9	60°9	54°4	40	1st, 6th	76	23rd	0°40	225	47
SOUTHAMPTON - -	45°0	64°0	54°5	35	1st	77	23rd, 24th	1°05	215	45
LAUDALE - - -	43°0	56°0	49°5	34	7th	71	24th	5°29	—	—
GLASGOW - - -	42°5	56°5	49°5	35	5th, 7th	70	23rd	2°83	142	28
SILLOTH - - -	42°8	58°6	50°7	32	7th	74	23rd	2°77	181	37
DOUGLAS - - -	43°6	55°8	49°7	34	7th	69	23rd	1°29	205	42
NEWTON REIGNY - -	41°0	58°4	49°7	32	19th	85	23rd	2°29	223	44
STONYHURST - -	42°5	58°9	50°7	35	19th	75	11th	2°32	214	45
BLACKPOOL - -	42°8	57°9	50°4	35	19th	76	11th	1°73	179	36
MANCHESTER - -	41°6	59°6	50°6	34	1st	76	11th	1°99	—	—
LLANDUDNO - -	45°9	58°4	52°2	40	3rd, 7th	75	11th	1°35	178	37
PEMBROKE - - -	*	*	*	*	*	*	*	*	205	43
ARLINGTON - - -	43°0	58°8	50°9	32	21st	75	24th	1°94	—	—
CULLOMPTON - -	42°5	62°6	52°6	31	21st	76	23rd, 24th	1°27	226	47
FALMOUTH - - -	47°8	57°2	52°5	42	1st	63	24th	1°37	217	46
PLYMOUTH - - -	46°6	61°2	53°9	36	1st	74	24th	1°00	201	42
JERSEY - - -	*	*	*	*	*	*	*	*	266	57
LONDONDERRY - -	43°3	59°5	51°4	35	7th	74	24th	3°51	—	—
MARKREE CASTLE - -	42°8	58°3	50°6	34	19th	72	23rd, 24th	2°82	159	32
BROOKEBOROUGH - -	41°8	58°1	50°0	32	19th	72	24th	4°22	—	—
ARMAGH - - -	42°6	58°2	50°4	37	2nd, 6th, 7th	68	24th, 25th	3°08	131	27
DUBLIN - - -	45°6	59°5	52°6	37	6th	69	11th	1°36	191	39
PARSONSTOWN - -	*	*	*	*	*	*	*	*	179	37
KILKENNY CASTLE - -	-	-	-	Temperature doubtful				1°33	—	—
WATERFORD - - -	43°8	59°2	51°5	33	19th	74	24th	1°30	—	—
VALENCIA - - -	*	*	*	*	*	*	*	*	191	40
FOYNES - - -	44°3	59°9	52°1	36	31st	75	24th	2°28	—	—

* Information in Table IX.

MONTHLY WIND CHART FOR MAY 1884.

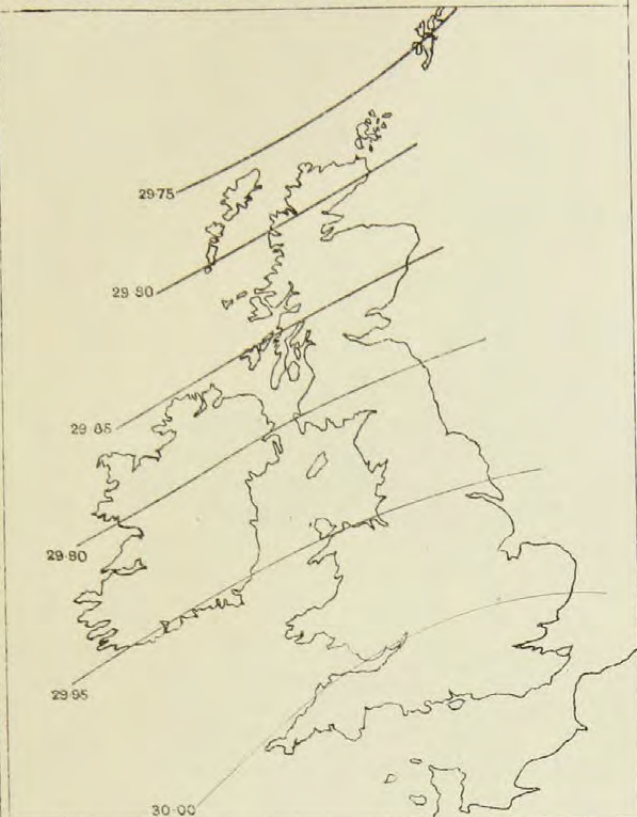
Plate X.



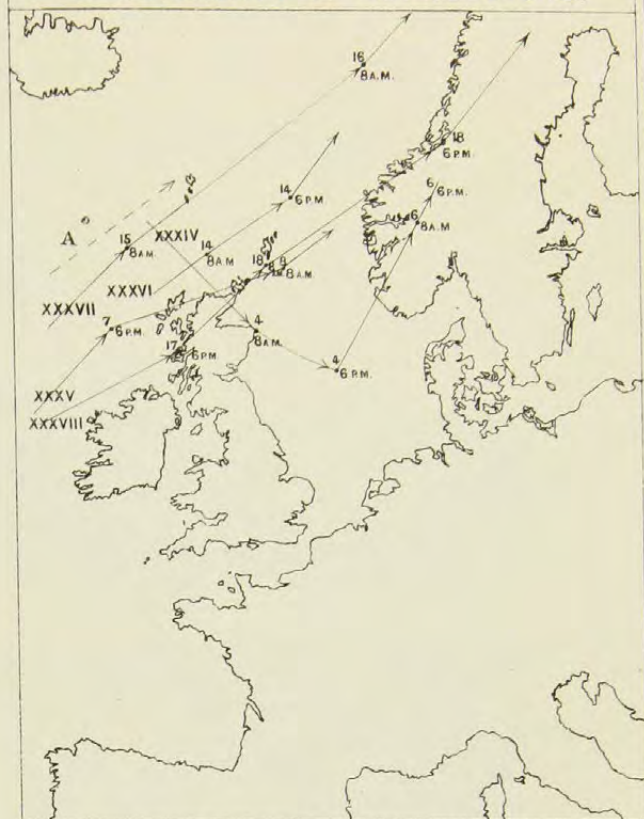
To face p. 58.

DANGERFIELD LITH. 22, BEDFORD ST. COVENT GARDEN.
8283

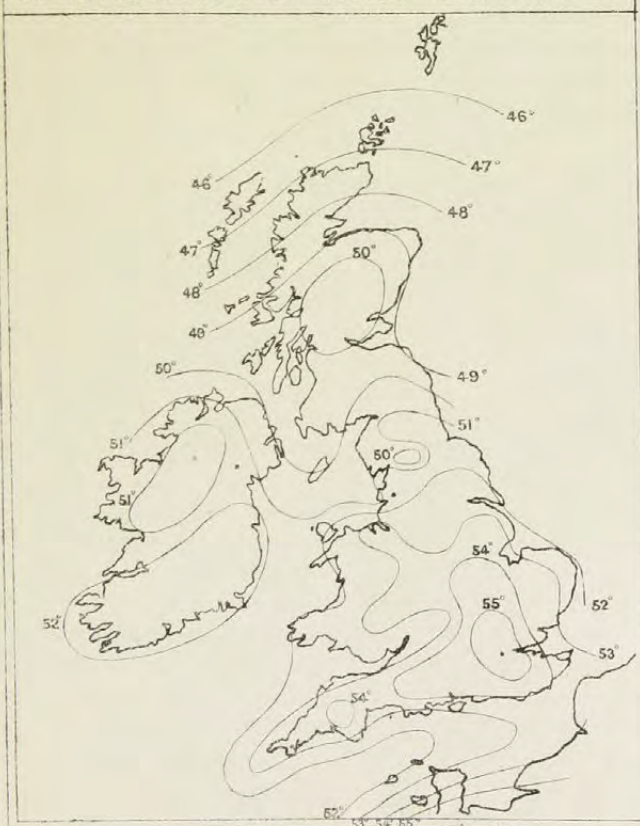
1. DISTRIBUTION OF MEAN PRESSURE



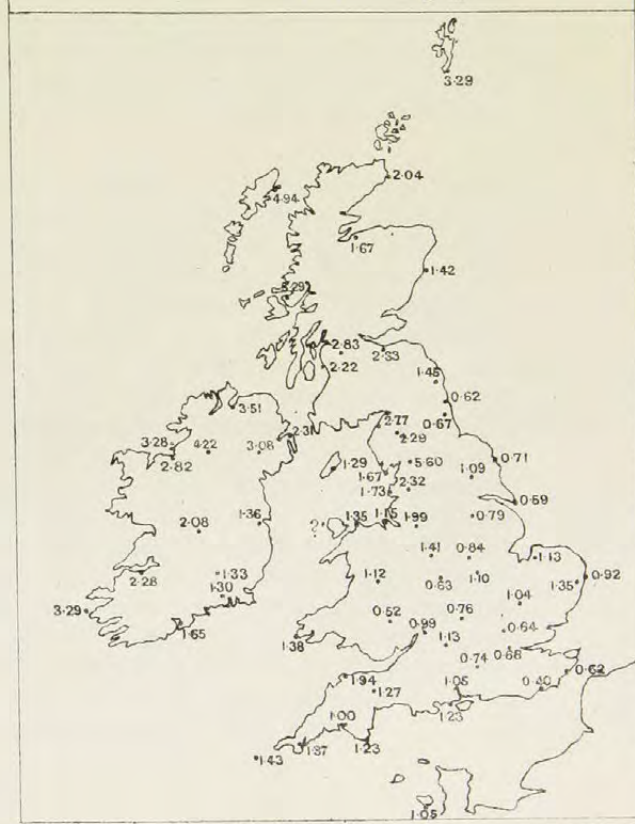
2. MOVEMENTS OF DEPRESSIONS.



3. DISTRIBUTION OF MEAN TEMPERATURE.



4. RAINFALL



MONTHLY WEATHER REPORT.

JUNE 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

OVER the British Islands and their neighbourhood the month of June was dry, cloudy, and, until near the end of the month, cold and gloomy. The last week of the month was decidedly warm and summerlike, the thermometer rising to between 80° and 84° over the greater part of England on the 27th and 28th. Barometric pressure was high generally and its range small. The winds were chiefly from the northward or north-westward, and of little strength; gales were almost unknown. Thunderstorms occurred frequently at intervals.

June 1-2.—The anticyclone, which had been lying partly over the Atlantic and partly over the western districts of Ireland during the latter half of May, moved south-eastwards towards the close of the month, and at 8 a.m. on June 1st covered the Bay of Biscay and nearly the whole of France. At the same time an apparently large and well-marked depression appeared to the north-westward of the Hebrides, with the result that South-westerly and Southerly winds set in on all our coasts, accompanied by a rise of temperature and genial weather. These conditions did not last long, for both this depression and a subsidiary disturbance (No. XXXIX.*) which was formed off the west of Scotland early on the 2nd, soon dispersed. A small new system (No. XL.*) was then formed at the mouth of St. George's Channel, and travelling south-eastwards and eastwards, united with another shallow disturbance which appeared over France on the 3rd; the resulting complex system finally disappeared in the neighbourhood of Strasbourg. (See the Weekly Weather Report, No. 23.) The rainfall brought by these disturbances was slight, and confined to the western and southern parts of the kingdom.

June 3-9.—The conditions now became more complex, gradients for Northerly and North-westerly winds being established over the United Kingdom and France, while gradients for Easterly winds prevailed over Scandinavia. Temperature again fell, and cold weather was experienced for several days, with a great deal of cloud and occasional falls of rain in some localities. Between the 4th and 7th (pressure being then lowest over the Baltic) a well-marked depression (No. XLI.*) advanced from the Baltic, and travelling steadily in a west-north-westerly direction, passed between the Shetlands and Orkneys on the 6th, and finally dispersed off the north-west of Scotland. A second and very similar disturbance followed in a slightly more northerly track, but this dispersed over the south of Norway on the night of the 7th. The first brought with it some cold rain to the northern parts of our Islands, while in the south the weather became even more unsettled owing to the formation of another small depression (No. XLII.*) near the mouth of St. George's Channel on the 6th. Its motion was east-south-easterly, and with it cold rainy weather was experienced over England, the fall of rain on the 6th amounting to 0.8 inch in London and 0.9 inch at Hurst Castle. Thus it will be seen that while over the more northern parts of our area depressions were moving more or less in a westerly direction from the Baltic, there was a disturbance over our south-western districts which moved eastwards towards North Germany.

* See Section II. and Map 2, Plate XIII., for the history and tracks of depressions.

On the 8th and 9th the distribution of pressure became somewhat less complex and gradients for Northerly winds prevailed on all our coasts. Cold, cloudy, showery weather prevailed, except in the west, and thunderstorms occurred in various parts of England, but the weather showed some signs of improvement.

June 10-14.—Pressure now began to give way on our north-western coasts, and as this change spread north-eastwards the high-pressure area over Scandinavia disappeared, while that over the Bay of Biscay increased, and developed into a well-marked anticyclone (No. XII., p. 62), which extended north-eastwards over France and the south of England. South-westerly breezes set in over the more northern parts of the kingdom, while variable airs were felt in the south; the sky cleared, temperature rose, and on the 13th the maxima over England ranged from 80° to 83° . The only rainfall experienced during this period was confined to the extreme northern and north-western parts of the kingdom. On the 13th-14th an apparently large depression passed in an easterly direction outside our extreme northern coasts towards the north of Scandinavia, but was at too great a distance from us for its track to be accurately made out (see the maps in the Weekly Weather Report 1884, No. 24). In its rear the barometer rose quickly at our western and northern stations, a new high-pressure area (No. XIII., p. 62) appeared off our western coasts, and our winds veered round to north-west and north, with dry but cloudy weather.

June 15-23.—During this period of nine days the centre of a large anticyclone lay off our western coasts while its eastern part spread over the United Kingdom generally. Northerly winds of little strength were consequently prevalent, and as the sky was generally cloudy during the daytime the temperature was not high. The nights, being clear, were decidedly cold. The highest of the daily maxima ranged as a rule between 65° and 75° , and the minima were sometimes as low as 40° to 43° in the shade. The air was dry, but some slight drizzling showers were experienced from time to time at our north-eastern and extreme south-eastern stations.

June 24-27.—A gradual and important change now took place. The anticyclone in the far west moved southwards and south-eastwards, until on the 27th the highest pressures were found over France and Great Britain, while the lowest lay to the westward of Ireland. The wind backed slowly from N.W. to the westward, and then to the southward, and the weather remained fine. Temperature rose considerably, so that the daily maxima over England increased to between 77° and 80° on the 26th, and to between 80° and 84° on the 27th, the air then became close and sultry, and fog or mist appeared in several localities. In Scotland the weather was cooler and rain fell at times.

June 28-30.—The anticyclone then moved north-eastwards to Scandinavia and grew larger, while another anticyclonic system appeared over the Bay of Biscay and the Peninsula. Between them shallow depressions were formed, thunderstorms and rain spread over the country, accompanied by varying winds and a fall of temperature. On the 30th, however, these disturbances were less pronounced, and the month closed with an improving tendency.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—JUNE 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XXXIX. June 1-2.	No. XL. June 2-4.	No. XLI. June 5-6.	No. XLII. June 6-7.
Form - - - -	About circular - - -	Nearly circular - - -	Nearly circular - - -	Badly defined at first, then oval.
Size - - - -	Large - - - -	Very small, to small - -	Moderate - - - -	Moderate.
Depth - - - -	Shallow - - - -	Very shallow, to shallow -	Shallow - - - -	Shallow.
Where first Observed -	Off the north-west of Scotland	Off the north coast of Cornwall.	Over the Skager Rack - -	At the mouth of St. George's Channel.
Direction of Motion -	Apparently stationary - -	South-easterly till 3rd, then easterly.	North-west and west-north-west.	Easterly.
Rate of Motion - -	None - - - -	Slow - - - -	Slow - - - -	Very slow.
Regions passed over by Steepest Gradients.	Scotland and north of Ireland; gradients slight.	English Channel and France.	Scandinavia and northern parts of our islands.	English Channel and North of France.
Termination - - -	Filled up off the west of Scotland.	Passed eastwards towards Germany.	Passed west-north-westwards over the Orkneys and apparently dispersed off the north of Scotland.	Was absorbed on the 8th by a large shallow low-pressure area lying to the eastward of the North Sea, which subsequently travelled away to the south-eastwards, over Germany.
Time under Observation -	About 2 days - - - -	Nearly 2 days - - - -	2 days - - - -	36 hours.
Accompanying Winds -	South-westerly, moderate to strong.	Southerly on its eastern side, Northerly in its rear; force moderate.	North-easterly to South-easterly in Norway. Very variable in Scotland (North to West and South).	Westerly to North-westerly in the south, North-easterly to Northerly on its northern and western sides.
Weather - - - -	Mild and rather showery -	Showery in the west and south.	Showery and cold. (See Remarks below.)	Cold and rainy, with local thunderstorms.
Rainfall - - - -	Not heavy; confined to our west and north-west coasts.	Very heavy at Jersey, slight on our southern coasts generally.	Slight, but pretty general in the northern districts.	Heavy at some of our southern stations, moderate or slight elsewhere.
REMARKS - - - -	<p>This depression was apparently subsidiary to a larger system which reached our extreme north-western coasts as the anticyclone, No. XL, (noticed at the close of May) was passing southwards and breaking up.</p> <p>Its behaviour in remaining where it first appeared until it broke up is somewhat singular.</p>			
	<p>This depression at first appeared to be subsidiary to No. XXXIX., but soon took an independent course by moving south-eastwards. When over France it united with another shallow disturbance which had been developed near Dijon, forming a complex system (see Weekly Weather Report, 1884, p. 90, and the Daily Weather Report for June 3rd); the whole system then moved eastwards to Germany. In this position it remained for some days, as a well-formed disturbance, developing a secondary (No. XLI.) on the 5th, and finally became a large ill-defined low-pressure area.</p>			
	<p>This depression was apparently developed as a secondary to No. XL. on the 5th and moved steadily in a north-westerly and westerly direction; until it disappeared off Cape Wrath on the 6th.</p> <p>During its advance towards our northern coasts another very shallow and small depression was developed over the Fen districts of England, producing heavy thunderstorms over the home counties and much rain.</p>			
	<p>This depression was formed over St. George's Channel at a time when there were two high-pressure areas, one over the south of France the other far away over northern Europe. These two high-pressure systems were separated by a broad irregularly formed band of low pressure in which several very shallow minima might be traced, the most important being near Wisby.</p>			

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS, JUNE 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XII. June 10-13.	No. XIII. June 14-30.
Form	Very irregular and variable	Very irregular and variable.
Size	Large	Large.
Height	Small	Small.
Where first Observed	Bay of Biscay and west of France	Off the west of Ireland.
Direction of Motion	Northerly and north-easterly	Motionless till after the 21st. It then moved south eastwards to France, and afterwards (on 28th) north-eastwards to Scandinavia.
Rate of Motion	Very slow	Variable; generally very slow.
Regions passed over	France and southern parts of the British Isles.	Our south-west coasts, the Bay of Biscay, France, and the eastern shores of the North Sea.
Termination	Dispersed as No. XIII. appeared in the west	Passed away over northern Russia.
Accompanying Wind	Westerly on its northern side; North-easterly over the south of France.	Northerly at first, backing to West and South as the centre moved southwards. Variable after the 27th.
„ Weather	Fine and bright; temperature rising, but not becoming high for the time of year.	Fine till the 28th, when thundery, unsettled weather set in over the United Kingdom.
REMARKS	On the 12th and 13th this system underwent considerable modifications in form; its crest becoming greatly elongated in a westerly to easterly direction. The whole system then dispersed, and the morning of the 14th found system No. XIII. spreading over our Islands from the westward.	This system underwent very great modification in form after the 21st. On the 28th and 29th it moved away north-eastwards, and a new system appeared over the Bay of Biscay, the two being separated by a distinct "hollow" of low pressure; in this hollow thunderstorms appeared.

SECTION III.

REMARKS FOR JUNE 1884.

(Tables XI. and XII., with Plates XII. and XIII.)

Pressure.—The mean pressure of the atmosphere at 8 a.m. varied from a little above 30·1 inches over the south of Ireland to a little below 29·9 inches in the south of the Shetlands, the gradients being very slight over Ireland and England, but somewhat more decided in the north. These values are somewhat in excess of the averages for the 20 years 1861–80, and the distribution of pressure was favourable for winds from a more northerly point than is common at this time of year. At the western and southern stations the highest readings were recorded between the 13th and 15th, when the mercury rose to above 30·5 inches at Valencia; in the east and north, however, they occurred a day or two later, when the anticyclone in the west had spread more completely over the kingdom. The lowest readings occurred on the 24th in the north, at the time when the anticyclone in the west was giving way, and a depression was moving far away to the northward of our Islands in a direction about parallel to the line marked “B” in Map 2, Plate XIII. In the south the lowest values were recorded on the 3rd, at which time depression No. XL.* was advancing over France from the westward. The range was not large anywhere.

Movements of Depressions.—These were very irregular; two of those which passed well within our area having travelled more or less in an easterly direction, while the motion of the other was about west-north-west. One remained stationary off the north-west coast of Scotland, where it filled up. None of them were either large or deep, but those in the south brought with them very thundery, showery weather, and those in the north some cold rain. Some large disturbances appeared at times to the westward of Ireland, apparently moving in a direction about parallel to the line marked A. on Map 2, and others (as already remarked) in the direction marked B, but these were all at a great distance, and had but little influence on our weather. There were also occasionally numerous disturbances, very small in size and extremely shallow, which brought much cloud and some little rain, but they were otherwise too unimportant to be treated of separately.

Anticyclones.—These were two in number, and exhibited no features worthy of note beyond those mentioned in the “Table of Anticyclonic Systems,” page 62.

Winds.—The winds were mainly North-westerly in the west and south, but were more Northerly on our north-east and east coasts; in Scotland there were considerable alternations between the Westerly and North-easterly currents, as will be seen on referring to the Monthly Wind Chart, Plate XII. Their forces were, as a rule, light to moderate, and there was a complete absence of gales, except in the far north, where the South-westerly and Westerly winds of a few depressions occasionally attained the force of a moderate or fresh gale.

Temperature.—The mean (sea level) temperature for the month varied from a little above 59° over the southern counties of England and a little above 58° over the south-east of Ireland to between 52° and 53° in the north of Scotland and to between 54° and 55° over the west of Ireland. These values show that notwithstanding the burst of hot weather near its close, the month was on the whole rather colder than the average over Great Britain and the west of Ireland, but just about the average in the south-east of Ireland. The highest readings were recorded very generally on the 27th or 28th, the exceptions being found on other dates at the extreme outlying parts of the coast only, such as at Wick, Valencia, Prawle Point, and Yarmouth. At some of the coast stations the phenomenon of land and sea breezes was occasionally developed, and the heat of the day at those places was consequently modified, although at stations only a few miles inland the higher temperatures were recorded, such as usually prevail in summer time over the inland parts of the country generally. The lowest temperatures occurred in most parts of England early on the 1st, in the north of Scotland on the 6th, and over the western parts of the Channel on the 7th (see Tables XI. and XII. pp. 66 to 68). The range was large, amounting to no less than 50° over our midland counties.

* See Section II., and Map 2, Plate XIII., for the history and tracks of depressions.

Vapour Tension was low generally; it varied from 0·40 of an inch at the mouth of the Channel to 0·32 of an inch over the north-west of England and at Nairn, but the values are not very evenly distributed. *Relative Humidity* was, as a rule, lowest (about 75) inland and highest (80 to 82) at the western and northern coast stations. At Stornoway it was as high as 87.

Rainfall was slight except over Gloucestershire, Wiltshire, and some neighbouring counties, in which cases some local thunderstorms swelled the amount to above its normal value. The smallest falls were experienced over the north-eastern and eastern parts of the kingdom, and were considerably less than half an inch; the number of "days with rain" was very small.

Bright Sunshine.—This was in defect over the whole of the United Kingdom, but especially over Scotland and the North of Ireland, where (the possible duration at each station being taken as 100) the total number of hours recorded amounted to only 20 to 30 per cent. The highest values were reported (1) from the Isle of Man, where the percentage was 42; (2) from the Norfolk coast, where it was about 43; (3) from the south-west coasts of England, where it ranged from 44 to 49; and lastly from Jersey, where it was as high as 54.

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS

MADE AT

TELEGRAPHIC REPORTING STATIONS IN THE BRITISH ISLANDS.

DURING THE MONTH OF JUNE, 1884.

TABLE XI.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
Observations are made at 8 a.m. daily, but the Number of Days of Rain, Snow, Hail,
(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head - - -	ins. 29° 927	49° 4	44° 8	53° 4	49° 1	34	2nd	58	30th
	Wick - - -	29° 974	52° 8	46° 0	58° 4	52° 2	39	10th	65	12th, 30th
	Stornoway - - -	29° 975	51° 8	46° 1	56° 8	51° 5	38	10th	71	29th
1. SCOTLAND, E.	Nairn - - -	29° 988	53° 5	48° 7	62° 4	55° 6	39	6th	75	29th, 30th
	Aberdeen - - -	29° 996	55° 4	47° 1	61° 3	54° 2	38	6th	73	28th
	Leith - - -	30° 001	56° 2	48° 2	63° 3	55° 8	43	3rd, 7th	76	28th
2. ENGLAND, N.E.	Shields - - -	30° 031	55° 1	46° 9	61° 4	54° 2	39	1st	76	13th
	York - - -	30° 049	55° 0	47° 0	66° 6	56° 8	38	1st	81	27th
	Spurn Head - - -	30° 031	54° 9	50° 2	59° 7	55° 0	44	1st	70	27th
3. ENGLAND, E.	Yarmouth - - -	30° 019	56° 3	50° 7	60° 1	55° 4	45	9th	69	11th, 30th
	Cambridge - - -	30° 042	57° 6	47° 1	68° 0	57° 6	40	1st, 3rd	82	28th
4. MIDLAND COUNTIES	Loughborough - - -	30° 052	56° 0	48° 0	67° 8	57° 9	33	1st	83	28th
	Oxford - - -	30° 056	55° 9	49° 8	66° 2	58° 0	38	1st	80	28th
5. ENGLAND, S.	London - - -	30° 050	57° 6	50° 4	67° 1	58° 8	44	1st	82	27th
	Dover - - -	30° 024	57° 4	51° 6	62° 2	56° 9	46	1st, 9th, 11th, 17th.	69	27th
	Hurst Castle - - -	30° 063	57° 1	51° 1	64° 6	57° 9	43	1st	73	28th
6. SCOTLAND, W.	Ardrossan - - -	30° 026	54° 9	48° 9	61° 2	55° 1	40	9th	79	28th
7. ENGLAND, N.W.	Hawes Junction* - - -	28° 816	52° 1	43° 5	59° 7	51° 6	35	1st	76	28th
	Barrow-in-Furness - - -	30° 034	54° 6	50° 7	61° 9	56° 3	46	4th, 14th	79	28th
	Liverpool - - -	30° 054	57° 2	51° 2	64° 0	57° 6	46	1st, 2nd, 10th	81	28th
	Holyhead - - -	30° 066	56° 2	50° 4	62° 3	56° 4	43	1st	78	28th
8. ENGLAND, S.W.	Pembroke - - -	30° 075	55° 0	50° 8	59° 3	55° 1	45	2nd	72	27th
	Prawle Point - - -	30° 079	58° 1	50° 1	64° 1	57° 1	40	7th	75	20th
9. IRELAND, N.	Donaghadee - - -	30° 061	55° 1	48° 4	61° 6	55° 0	41	14th	73	13th
	Mullaghmore - - -	35° 057	54° 7	51° 6	60° 6	56° 1	44	2nd	74	28th
10. IRELAND, S.	Parsonstown - - -	30° 109	54° 7	47° 7	64° 0	55° 9	38	14th	75	27th
	Valencia - - -	30° 126	56° 8	49° 3	61° 8	55° 6	44	2nd	70	21st
	Roche's Point - - -	30° 116	56° 6	50° 2	63° 6	56° 9	42	2nd, 4th	70	24th
CHANNEL ISLANDS	Scilly (St. Mary's) - - -	30° 088	57° 3	52° 4	60° 8	56° 6	46	7th	68	26th, 27th
	Jersey (Noirmont) - - -	30° 068	56° 5	51° 1	62° 7	56° 9	45	7th	75	27th

* Hawes Junction is 1,125 feet above Mean Sea Level, and the

TABLE XI.

REPORTING STATIONS in the BRITISH ISLANDS during the Month of June 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred.

beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calms.
ins. 0.305	87	8.7	ins. 1.48	ins. 0.50	24th	16	0	0	0	1	21	0	2	5	1	3	3	3	7	6	0
330	82	8.0	1.71	0.26	22nd	15	0	0	0	3	21	1	4	1	2	0	10	2	3	6	2
338	87	7.8	1.81	0.39	1st, 12th	17	0	0	0	4	19	5	2	5	1	1	7	2	7	3	2
321	78	7.1	1.04	0.25	16th	11	0	0	0	6	18	1	0	2	1	0	0	4	5	2	16
327	74	6.0	0.98	0.36	22nd	12	0	0	0	7	10	2	8	1	0	5	5	3	2	4	2
335	74	6.5	0.63	0.37	5th	7	0	0	0	3	8	0	2	4	5	1	1	2	6	7	2
348	80	7.8	1.39	0.41	8th	9	0	0	0	4	17	0	4	6	2	2	1	4	3	5	3
337	78	5.6	0.31	0.11	5th	8	0	0	0	11	12	0	9	2	2	1	3	2	3	8	0
355	83	4.5	0.43	0.22	8th	6	0	0	0	11	4	0	10	2	3	1	1	2	4	6	1
359	78	4.3	0.33	0.13	7th	8	0	0	0	13	4	0	12	2	2	3	1	1	3	6	0
361	76	5.9	1.67	0.66	5th	8	0	1	2	9	12	0	15	1	4	1	2	2	1	3	1
355	79	7.4	1.13	0.51	8th	10	0	0	2	2	13	0	3	2	3	1	1	1	8	7	4
354	79	5.8	2.15	0.72	5th	7	0	2	3	10	12	0	7	8	0	1	1	1	5	7	0
354	75	6.3	2.03	0.81	6th	8	0	0	2	8	13	0	3	5	4	0	1	2	5	5	5
363	77	4.1	1.18	0.32	8th	10	0	0	0	9	4	0	7	6	5	0	0	2	8	1	1
387	82	5.2	2.61	0.94	6th	9	0	0	3	7	4	0	6	10	1	0	2	2	5	3	1
355	83	7.0	0.38	0.13	1st	10	0	0	1	5	13	0	0	1	1	1	1	5	8	5	8
309	79	4.1	0.66	0.14	8th	11	0	0	0	12	6	0	7	1	4	0	4	5	4	5	0
353	84	5.7	0.32	0.13	29th	5	0	0	0	9	11	0	8	3	1	2	4	1	4	7	0
339	72	5.0	0.79	0.32	7th	8	0	0	0	10	6	0	2	2	3	2	2	3	9	7	0
362	80	6.4	1.32	0.73	28th	8	0	0	0	5	12	0	5	0	2	1	4	4	3	7	4
365	85	6.2	0.45	0.25	3rd	7	0	0	0	7	9	0	6	2	1	1	2	2	6	8	2
387	79	4.6	0.94	0.22	6th	8	0	0	0	11	8	0	3	4	2	1	2	5	2	9	2
358	82	5.7	1.07	0.41	28th	10	0	0	0	4	6	0	7	2	4	1	4	3	5	4	0
350	82	7.9	1.23	0.30	1st	16	0	0	0	2	13	0	2	0	2	1	0	8	6	8	3
343	81	7.1	0.85	0.20	1st	8	0	0	0	7	19	0	4	0	2	0	5	3	4	5	7
377	81	7.1	1.42	0.46	1st	12	0	0	0	4	13	0	5	2	0	2	4	2	4	6	5
365	79	4.8	0.52	0.15	1st	10	0	0	0	9	4	0	8	3	1	1	2	0	6	9	0
388	82	7.2	0.73	0.16	6th	14	0	0	0	2	9	1	9	2	2	1	1	3	4	8	0
401	88	5.8	4.40	1.20	2nd	10	0	2	1	9	10	2	4	4	1	0	1	1	9	9	1

barometric observations at this Station are not reduced to sea level.

TABLE XII.

OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of June 1884.

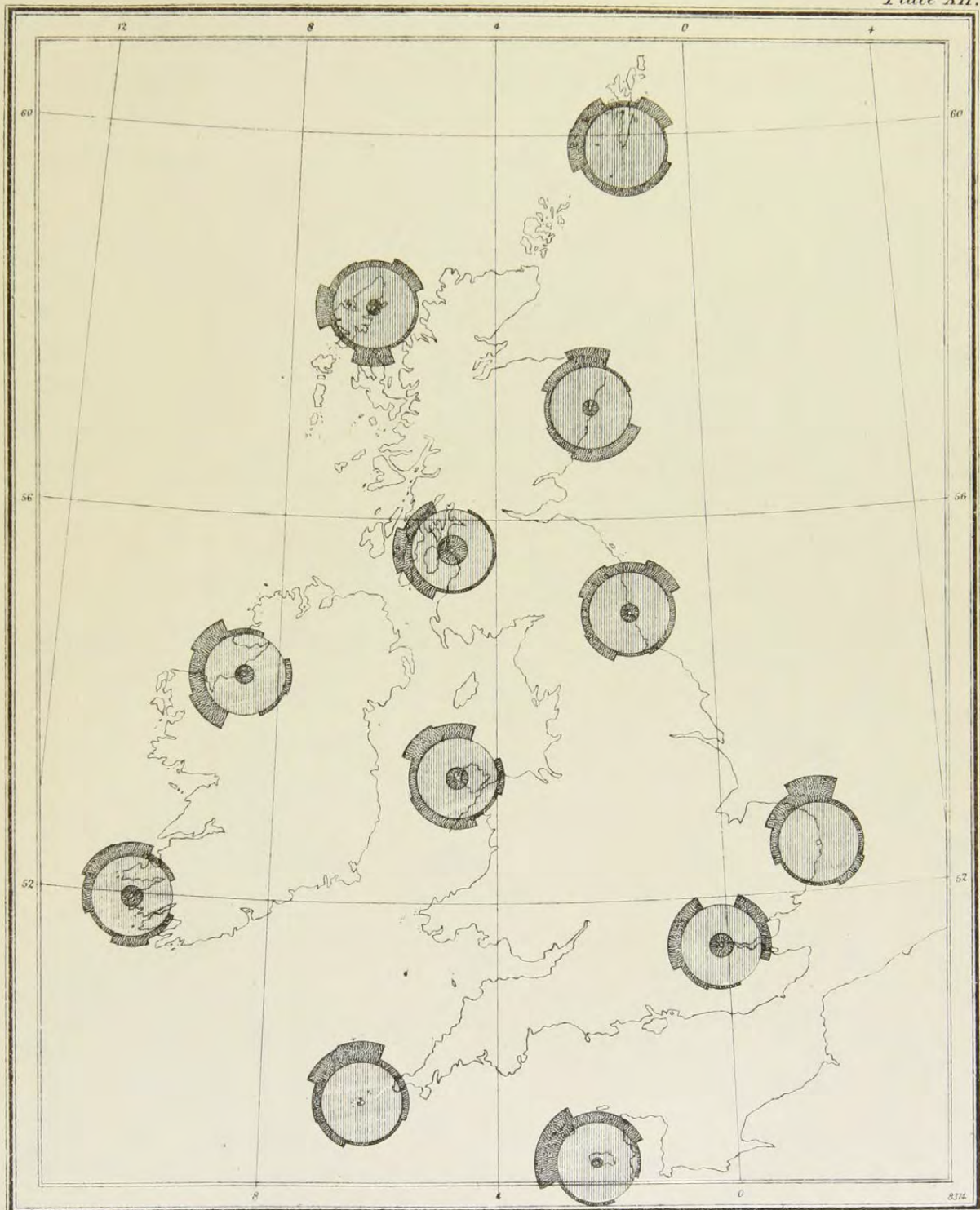
STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per-centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Mini-mum.	Date.	Maxi-mum.	Date.			
STORNOWAY	*	*	*	*	*	*	*	*	136	25
ABERDEEN	*	*	*	*	*	*	*	*	160	30
ALNWICK CASTLE	48'2	60'8	54'5	41	20th	72	13th, 28th	0'86	? —	? —
SCARBOROUGH	49'1	60'9	55'0	40	1st	79	13th	0'47	—	—
YORK	*	*	*	*	*	*	*	*	175	35
HILLINGTON	46'0	67'8	56'9	39	26th	84	28th	1'17	209	42
GILDESTON	47'2	64'4	55'8	41	2nd	78	26th	0'79	218	44
CAMBRIDGE	*	*	*	*	*	*	*	*	190	39
ROTHAMSTED	47'7	65'8	56'8	35	1st	78	13th, 27th	2'50	—	—
BAWTRY	46'3	69'5	57'9	34	1st	84	26th	0'68	—	—
LEICESTER	48'0	68'2	58'1	34	1st	83	28th	1'87	140	28
BIRMINGHAM	47'5	66'2	56'9	39	1st	81	28th	2'00	—	—
CHEADLE	†	†	†	†	†	†	†	†	—	—
CHURCHSTOKE	45'0	65'2	55'1	35	10th	80	28th	2'04	176	35
HEREFORD	47'9	69'4	58'7	35	1st	83	28th	2'82	—	—
CIRENCESTER	47'5	65'4	56'5	33	1st	79	28th	2'97	164	33
OXFORD	*	*	*	*	*	*	*	*	164	33
LONDON	*	*	*	*	*	*	*	*	134	27
MARLBOROUGH	48'0	66'7	57'4	35	1st	83	28th	3'51	154	32
STRATHFIELD TURGISS	47'6	68'9	58'3	34	1st	83	28th	2'61	—	—
HASTINGS	50'8	63'1	57'0	45	8th, 18th	79	28th	2'06	180	37
SOUTHAMPTON	50'8	68'4	59'6	41	1st	81	28th	2'17	189	39
LAUDALE	47'3	60'2	53'8	40	9th	78	28th	2'07	—	—
GLASGOW	47'8	62'2	55'0	40	9th	81	28th	1'10	110	21
SILLOTH	47'9	66'0	57'0	39	7th	83	28th	0'46	171	33
DOUGLAS	47'4	62'7	55'1	37	1st	76	28th	0'67	212	42
NEWTON REIGNY	55'3	63'3	54'3	34	4th	80	28th	0'91	166	32
STONYHURST	47'6	64'4	56'0	39	1st	79	28th	1'12	177	35
BLACKPOOL	47'9	62'4	55'2	38	4th	81	28th	0'55	186	37
MANCHESTER	46'3	64'5	55'4	37	1st	80	28th	0'98	—	—
LLANDUDNO	50'0	63'0	56'5	42	1st, 2nd, 10th	81	28th	1'18	197	39
PEMBROKE	*	*	*	*	*	*	*	*	216	44
ARLINGTON	46'8	63'3	55'1	38	1st, 10th	74	27th	1'83	—	—
CULLOMPTON	48'0	67'8	57'9	37	1st, 10th	77	13th	2'57	196	40
FALMOUTH	51'0	63'2	57'6	45	6th, 7th	71	10th, 20th, 21st, 22nd.	1'35	236	49
PLYMOUTH	51'3	67'1	59'2	42	7th, 10th	75	20th, 21st	0'73	212	44
JERSEY	*	*	*	*	*	*	*	*	258	54
LONDONERRY	47'9	63'8	55'9	40	2nd, 10th	81	28th	1'33	—	—
MARKREE CASTLE	47'0	61'2	54'1	39	5th	75	28th	1'09	113	22
BROOKEBOROUGH	46'6	62'8	54'7	37	5th	78	28th	0'99	—	—
ARMAGH	48'1	63'5	55'8	40	7th	76	28th	0'93	105	21
DUBLIN	50'7	65'0	57'9	43	8th	75	13th	1'25	119	24
PARSONSTOWN	*	*	*	*	*	*	*	*	129	26
VALENCIA	*	*	*	*	*	*	*	*	178	36
FOYNES	47'4	62'2	54'8	40	3rd, 12th	72	30th	1'15	—	—

* Information to be found in Table XI.

† Records incomplete.

MONTHLY WIND CHART FOR JUNE 1884.

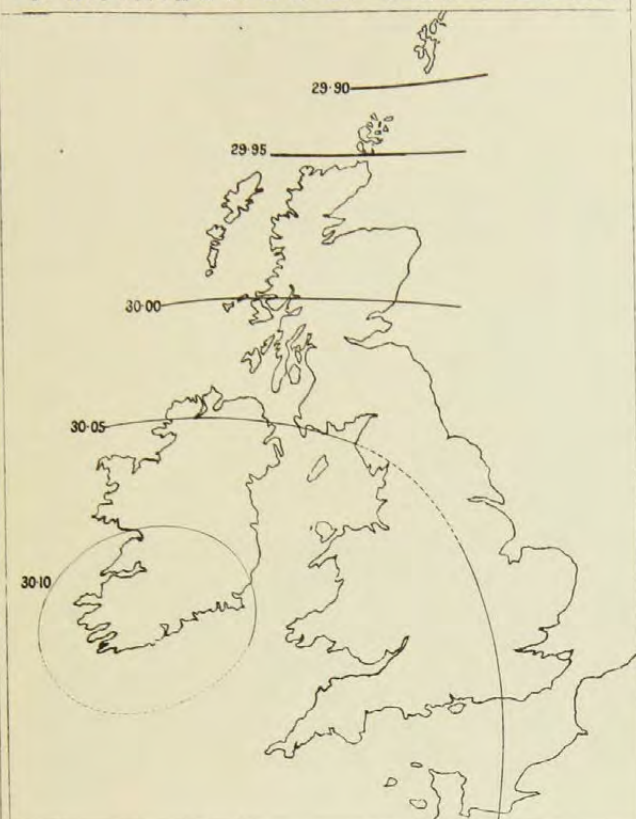
Plate XII.



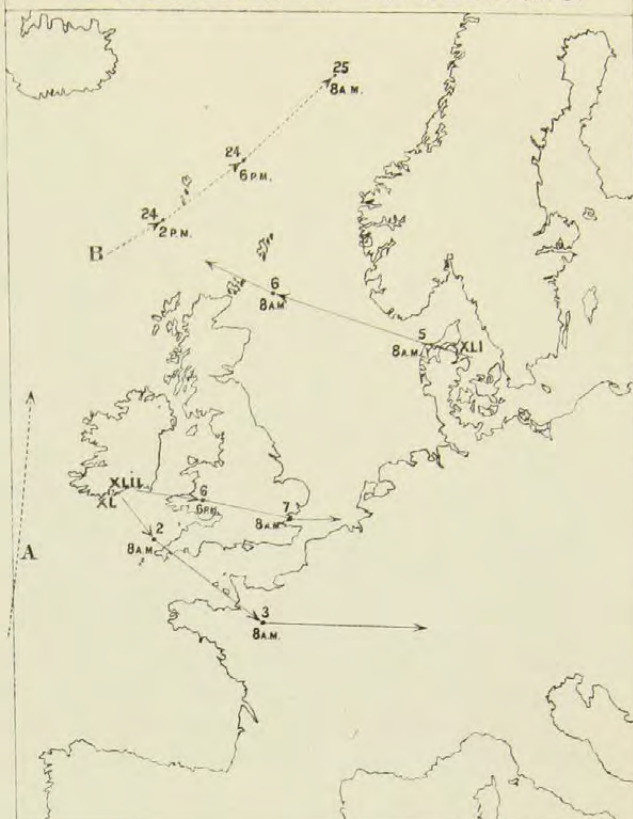
To face p. 68.

DANCERFIELD, LITH. 22, BEDFORD ST. COVENT GARDEN.

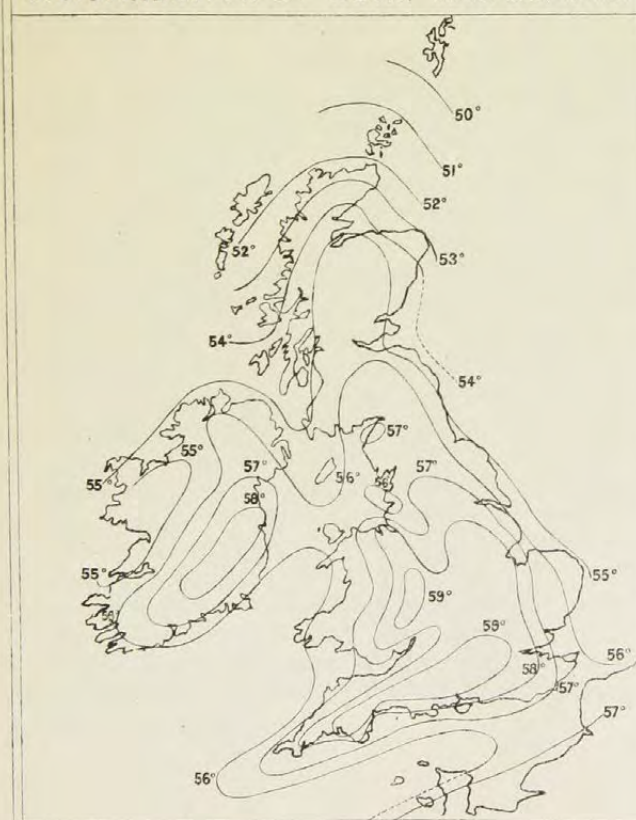
1. DISTRIBUTION OF MEAN PRESSURE



2. MOVEMENTS OF DEPRESSIONS.



3. DISTRIBUTION OF MEAN TEMPERATURE.



4. RAINFALL



MONTHLY WEATHER REPORT.

JULY 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather over the British Islands during July was very changeable. On several occasions it was bright and decidedly warm, maximum readings of 83° to 88° being recorded on the 4th, and 83° to 85° on the 8th; on other occasions, however, it was cloudy, showery, and very cold—the sheltered thermometer falling to 35° at Wick on the 21st, and to 39° in the east of Scotland and 42° in London on the 26th and 27th respectively. The mean temperature of the month was slightly below the average. Rainfall was frequent, and at times heavy. Thunderstorms were of very frequent occurrence, and in some cases severe. The winds were light and variable; pressure was about its normal value, and its range was small.

July 1-2.—The improvement in the weather, which had commenced on June 30th, continued during the first few days of July, pressure becoming very uniform (especially on the 2nd), while the sky cleared and temperature rose steadily. The daily maximum in London increased from 74° on June 30th to 76° on July 1st, and to 78° on the 2nd.

July 3-11.—During this period the winds and weather were of a complex southerly type, for while pressure was on the whole highest over the Continent and lowest over the Atlantic, there were generally two distinct high-pressure areas prevalent, one over northern and the other over southern Europe. From time to time some well-formed depressions passed northwards outside our extreme western coasts in a direction about parallel to the line marked "A" on Map 2, Plate XV. These brought with them cloudy, showery, thundery weather, and as during their passage subsidiary disturbances were developed in the "hollow" which separated the two high-pressure areas referred to above, a great intermingling of South-easterly and South-westerly currents of wind was produced over our Islands, with the result that the thunderstorms and showers spread over all parts of the kingdom. Three distinct disturbances of this kind occurred, the first being in connection with the depression of the 3rd, which extended to our eastern districts late on the 4th; the second on the 6th and 7th, and the third on the 10th and 11th. Between the showery and relatively cool spells, the thermometer at times rose decidedly, so that the whole period under notice was (so far as England is concerned) subdivided into warm and cool spells, the warm periods culminating on the 4th, when the maximum temperature in London was 86° , and on the 8th, when the maximum was 84° . In the cooler intervals the maxima were much lower, that on the 6th being only 71° , and on the 10th 72° . Although the effect of these disturbances in producing showery thundery weather was so decided, the centres of the main depressions lay too far to the westward of our Islands for their movements to be shown accurately on Map 2, while the movements of the subsidiaries were too fitful and ill-defined to be represented graphically on Map 2, Plate XV. This feature in the thunderstorm disturbances of summer is very common.

July 12-17.—The northern high pressure area now gave way, and a gradual change took place in the distribution of pressure, temperature, and wind over our islands. At first the tendency was favourable for Southerly winds, but after the 13th it changed gradually for winds from South-west, and depressions began to move in a north-easterly direction past our extreme north-western coasts. The first of these passed up between the 13th and 14th, but like its predecessors, was at too great a distance for its track to be shown accurately on Map 2; it brought with it, however, a decided freshening of the wind from South and South-west, a large amount of cloud, a great deal of rain to the western stations, a smaller quantity in the east, with such a reduction of temperature that the thermometer, which rose to 78° at York and 82° in London on the 13th, did not rise above 72° or 73° at either station on the 14th and 15th. The second disturbance, the centre of which lay off our north-west coasts on the 16th, moved at first in much the same track as its predecessors (see the Weekly Weather Report, No. 29), but after reaching the neighbourhood of the Farö Isles, it took a rather north-easterly course, and travelled away, outside the western coasts of Norway on the following day. Its movements are shown approximately by the broken arrow marked "B" on Map 2, Plate XV. During this period thunderstorms became less and less numerous, and on the 17th none were reported.

July 18th.—During this day the distribution of pressure was favourable for Westerly winds, owing to a rise of the barometer over our islands and the Bay of Biscay, accompanied by a fall over Norway. The wind veered Westwards and moderated, temperature again decreased (the maximum over England being all below 70°), but the weather remained cloudy and more or less showery in all districts. The conditions were, however, transitional from a spell of South-westerly to one of North-westerly winds.

July 19-29.—This was a period in which the isobars and winds over north-western Europe were, as a whole, of a North-westerly type, but in the British Isles the distribution of pressure was so complicated by the presence of several shallow local depressions, that the North-westerly winds were often mingled with winds from the South-westward and Westward, and the weather was consequently warmer than might have been expected. Most of the disturbances were very shallow, and their duration too brief for their characteristics to be tabulated in Section II., or their movements to be shown on Map 2, Plate XV. During the night of the 23rd, however, a more decided system was developed off the east coast of Scotland, and while its centre moved north-eastwards and northwards to Norway, a subsidiary "hollow" was formed over the North Sea; the result was that the wind veered to North-west and North all over our Islands, accompanied by a great fall of temperature (see Cyclonic System, No. XLIII.*), showery weather, and thunder and lightning in many places. As this system passed off the sky cleared, the thermometer in London fell to 42° in the shade early on the 24th, and to 32° on the grass. No sooner had this disturbance dispersed, than a new and somewhat complex system (No. XLIV.*) came over Ireland from the Atlantic on the 26th, and, moving in a south-easterly direction, reached North Germany early on the 28th. This also brought with it unsettled thundery weather and considerable oscillations of temperature, but in its rear the sky cleared for a time, and on the 28th the thermometer rose to 78° in London. The weather, however, remained unsettled and showery.

July 30-31.—The various disturbances just referred to now passed away to the Eastward of the North Sea, and pressure became more uniformly distributed over France and the United Kingdom, the readings at 8 a.m. on the 30th varying from a little above $30\cdot2$ inches at the French stations to somewhat below $30\cdot1$ inches off our north-west coasts. The winds became chiefly South-easterly and Southerly, temperature rose (the maxima in many parts of England ranging from 75° to 78° on the 31st), and the weather improved greatly.

* See Section II., and Map 2, Plate XV., for the history and tracks of depressions.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—JULY, 1884.

NATURE OF CHARACTERISTICS OBSERVED.		No. XLIII. July 23-26.	No. XLIV. July 26-27.
Form	- - - - -	Variable; circular near its centre	Somewhat oval, but irregular.
Size	- - - - -	Moderate to large	Small.
Depth	- - - - -	Shallow, gradients steepest on its north-eastern side.	Shallow.
Where first Observed	- - - - -	Was formed off the east of Scotland	Over the north of Ireland.
Direction of Motion	- - - - -	North-easterly and northerly	East-south-east.
Rate of Motion	- - - - -	Slow	Slow.
Regions passed over by Steepest Gradients	- - - - -	Sweden and Norway	Ireland and England.
Termination	- - - - -	Travelled away to the northward	Dispersed over North Germany.
Time under Observation	- - - - -	Two and a half days	About 36 hours.
Accompanying Winds	- - - - -	Northerly and Westerly in our Islands, South-easterly and Southerly over Scandinavia; subsequently veering to West in south of Norway.	Fresh Westerly to Northerly winds over England, Ireland, and France; light North-easterly in Scotland.
„ Weather	- - - - -	Showery and cold; thunderstorms in many places	Showery and cold; some thunder in the south-east.
„ Rainfall	- - - - -	General, but not heavy	General, but not heavy.
REMARKS	- - - - -	<p>This disturbance was formed in a "hollow" of low pressure which spread over Scotland during the 22nd, from a depression the centre of which then lay off our extreme north-western coasts. It moved East-north-eastwards at first, but subsequently Northwards. A subsidiary disturbance was developed in its rear, and, moving South-eastwards to the North Sea, drew the wind into North-west over England.</p> <p>This disturbance was formed by the union of two smaller systems, one of which advanced to the Irish coast from the south-westward early on the 23rd, while the other reached the north-west of Ireland from the north-westward later on the same day. Pressure was, on the whole, highest over south-western and lowest over northern Europe.</p>	

ANTICYCLONIC SYSTEMS.

NATURE OF CHARACTERISTICS OBSERVED.		No. XIV. July 30-31.
Form	- - - - -	Varying considerably.
Size	- - - - -	Large.
Height	- - - - -	Very small.
Where first Observed	- - - - -	Over France.
Direction of Motion	- - - - -	None.
Rate of Motion	- - - - -	None.
Regions passed over	- - - - -	France; subsequently spreading over the British Isles.
Termination	- - - - -	(See the August Report.)
Accompanying Wind	- - - - -	Very light; Easterly in the west of France, Southerly over the United Kingdom.
„ Weather	- - - - -	Fine, but hazy; heavy dews at night.
REMARKS	- - - - -	<p>This anticyclone was accompanied by the first settled weather after the generally broken and disturbed conditions of July.</p> <p>For details of the system after July 31st, see the Monthly Report for August.</p>

SECTION III.

REMARKS FOR JULY 1884.

(*Tables XIII. and XIV. with Plates XIV. and XV.*)

Pressure.—During the month of July the mean (sea level) pressure at 8 a.m. varied from about 29·98 inches over the extreme south-east of England, to about 29·82 inches in the Hebrides and the extreme north-west of Ireland. In the south-east of England the values are identical with the averages for this time of year during the 20 years 1861–80, but in the western parts of the kingdom they are slightly low, so that the distribution of pressure was favourable for winds from a more southerly point than is usual. At our southern stations the highest readings (30·2 +) were recorded both on the 1st and 31st of the month, but in the north and north-west they were recorded on the 1st, when the mercury rose to between 30·15 inches and 30·19 inches. The lowest readings were very generally recorded on the 16th or 17th, when the depression referred to on page 70 was passing in a north-easterly direction outside our extreme north-western coasts. The range during the month was small, especially in the south and east.

Movements of Depressions.—These were very varied. Some passed in a northerly or north-easterly direction outside our western and north-western coasts, at too great a distance for their tracks to be drawn with any pretence to accuracy. The two which passed immediately over our area were comparatively shallow systems, and their movements were at times somewhat erratic. The disturbance No. XLIV.* affords a good instance of the merging of two small disturbances into one, which, notwithstanding its being so shallow, retained the form of a complex disturbance, having two minima, until it disappeared from our area. Small and very shallow subsidiary disturbances, shown by a mere bend or “bight” in the isobars, were very numerous during the month, and brought with them frequent thunderstorms, but it would be impossible to show their movements on Map 2, or to discuss them minutely in the present report.

Anticyclones.—The only well-formed anticyclone which appeared over our area is described on page 71. The other high-pressure areas which influenced our weather lay at too great a distance from the United Kingdom for their characteristics to be tabulated.

Winds.—These were chiefly Westerly and South-westerly over the south-western and southern parts of the kingdom, Southerly to Easterly in the north, but were, as a rule, light in force. It will be seen from Table XIII. that gales were of rare occurrence, those reported being confined almost entirely to parts of our extreme south-western and western coasts, where the influence of the depressions which passed in a northerly direction outside the western coast of Ireland caused some Southerly gales locally.

Temperature.—The mean (sea level) temperature of the month varied from somewhat above 64° in the neighbourhood of London to about 55° in the north-east of Scotland. In Ireland the values ranged from a little above 61° over the south-eastern counties to somewhat below 59° in the west. These values show an advance since June of between 4° and 5° over our south-eastern counties, 2° or 3° in the north of Scotland, and about 3° over Ireland. Compared with the mean values for the 20 years 1861–80 they show a deficit of somewhat less than a degree in all districts. The highest values recorded occurred on the 3rd or 4th, in almost all parts of the kingdom, while the lowest (and they were very low) were registered on the 26th or 27th over England and the east of Scotland, and between the 19th and 21st over the remaining part of Scotland and in Ireland. The range over England was considerable, amounting to 46° at Bawtry, 45° at Cambridge, and 44° in London.

* See Section II., and Map 2, Plate XV., for the history and tracks of depressions.

Vapour Tension varied from about 0·36 of an inch at Sumburgh Head and a little below 0·38 of an inch over the northern half of Scotland to about 0·44 or 0·45 of an inch along the south coast of England, and to 0·48 of an inch at Jersey. *Relative Humidity* was lowest (74 to 80) over the inland parts of England, but was as high as 88 or 89 in the extreme west, east, north, and south.

Rainfall was in excess of the average for the 15 years 1866–80 in most places, and at our north-western stations the excess was large. In the north of Scotland, the south-east of Ireland, and over some parts of England, however, there was a slight deficit. The largest amounts measured in one day were 1·75 inches at Valencia on the 13th, 1·63 inches at York, 1·41 inches at Hawes on the 10th, and 1·14 inches at Leith on the 5th. The number of days of rain varied from between 13 and 15 at some of our northern and eastern stations to 25 at Stornoway, 26 at Hawes Junction and Valencia, and 28 at Mullaghmore.

Bright Sunshine.—Assuming that the total possible duration of bright sunshine at each station is represented by 100, the amounts actually recorded varied from 25 to 40 in most places. At Glasgow, however, the percentage was as low as 21, while at Hastings it was 41, and at Falmouth 44.

TABLE XIII.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC

Observations are made

(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			Means of				Absolute Extremes.			
			At 8 a.m.	Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head	ins. 29° 856	53° 3	47° 9	57° 2	52° 6	40	21st, 22nd, 29th, 30th, 21st	64	11th
	Wick	29° 851	55° 1	48° 0	60° 8	54° 4	35		69	15th
	Stornoway	29° 820	56° 0	49° 7	61° 9	55° 8	39	20th	70	4th, 7th, 9th
1. SCOTLAND, E.	Nairn	29° 845	56° 3	51° 4	63° 5	57° 5	39	27th	76	9th
	Aberdeen	29° 861	57° 2	49° 9	62° 7	56° 3	39	27th	70	13th
	Leith	29° 858	57° 4	51° 8	65° 4	58° 6	43	20th	75	8th
2. ENGLAND, N.E.	Shields	29° 883	57° 6	52° 2	63° 0	57° 6	43	20th	71	31st
	York	29° 914	59° 8	53° 2	70° 2	61° 7	44	20th, 26th	83	3rd
	Spurn Head	29° 920	60° 0	55° 6	65° 6	60° 6	50	26th	73	6th
3. ENGLAND, E.	Yarmouth	29° 950	62° 2	55° 7	67° 7	61° 7	47	26th	74	16th
	Cambridge	29° 953	63° 3	52° 6	73° 0	62° 8	42	26th	87	4th
4. MIDLAND COUNTIES	Loughborough	29° 935	60° 9	53° 7	71° 1	62° 4	45	26th	86	4th
	Oxford	29° 958	61° 1	54° 5	69° 8	62° 2	43	3rd	81	3rd
5. ENGLAND, S.	London	29° 977	63° 6	54° 6	73° 2	63° 9	42	26th	86	4th
	Dungeness	29° 982	62° 0	55° 9	68° 0	62° 0	44	26th	73	4th, 8th
	Hurst Castle	29° 976	61° 0	56° 3	67° 9	62° 1	43	26th	75	17th
6. SCOTLAND, W.	Ardrossan	29° 849	57° 5	53° 1	64° 0	58° 6	43	20th	74	3rd
7. ENGLAND, N.W.	Hawes Junction*	28° 682	55° 9	49° 5	62° 5	56° 0	40	19th, 20th, 26th, 20th	75	3rd
	Barrow-in-Furness	29° 883	58° 3	55° 2	64° 8	60° 0	49		74	5th
	Liverpool	29° 899	60° 7	55° 1	67° 3	61° 2	49	26th	77	4th
	Holyhead	29° 893	59° 5	55° 1	64° 4	59° 8	51	26th, 27th	73	3rd
8. ENGLAND, S.W.	Pembroke	29° 908	58° 0	55° 5	62° 2	58° 9	52	2nd, 25th	68	3rd
	Prawle Point	29° 973	59° 2	54° 4	64° 6	59° 5	48	26th	73	29th
9. IRELAND, N	Donaghadee	29° 866	56° 5	51° 5	62° 9	57° 2	45	20th, 26th	69	21st
	Mullaghmore	29° 817	57° 9	54° 9	64° 2	59° 6	46	26th	72	3rd
10. IRELAND, S.	Parsonstown	29° 872	57° 6	51° 9	66° 6	59° 3	41	19th	73	2nd, 3rd
	Valencia	29° 859	58° 8	54° 1	63° 6	58° 9	45	1st	68	5th
	Roche's Point	29° 885	59° 4	53° 4	65° 5	59° 5	48	8th	71	3rd
CHANNEL ISLANDS	Scilly (St. Mary's)	29° 932	61° 0	55° 9	64° 7	60° 3	53	10th, 25th, 26th, 30th, 26th	69	3rd, 5th, 6th
	Jersey (Noirmont)	30° 003	61° 1	57° 0	67° 0	62° 0	51		77	31st

* Hawes Junction is 1,135 feet above the Mean Sea Level, and the

TABLE XIII.

REPORTING STATIONS in the BRITISH ISLANDS during the Month of July 1884.

at 8 a.m. daily, complete up.

beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calm.
ins. 0.359	°/89	7.5	ins. 1.91	in. 0.37	31st	15	0	0	0	4	17	0	4	5	8	3	2	0	2	4	3
.380	87	7.3	1.60	0.28	23rd	14	0	0	1	2	18	1	2	0	3	5	10	1	1	6	3
.383	85	7.1	3.09	0.43	23rd	25	0	0	2	7	17	2	2	4	9	4	5	2	3	2	0
.371	81	7.7	2.08	0.34	6th	21	0	0	3	5	19	0	0	1	2	1	1	2	4	4	16
.386	82	7.1	2.93	0.51	21st	18	0	1	1	6	17	0	2	1	2	8	6	3	1	4	4
.384	81	7.1	4.78	1.14	5th	24	0	0	7	3	10	0	2	2	8	4	1	4	4	5	1
.404	84	8.5	2.45	0.38	13th	18	0	0	2	0	18	0	2	4	2	1	4	9	4	0	5
.417	81	6.0	4.40	1.63	10th	23	0	0	2	8	11	0	5	1	1	2	8	7	4	2	1
.453	88	4.4	1.67	0.39	4th	15	0	0	7	11	3	0	2	1	2	6	4	8	4	3	1
.450	81	4.2	2.76	0.83	19th	19	0	0	5	10	2	0	2	1	1	5	3	6	8	3	2
.467	80	5.0	3.08	0.60	9th	18	0	0	7	13	9	0	5	0	2	1	8	9	4	2	0
.431	80	7.1	2.94	0.54	8th	21	0	0	9	1	11	26	2	1	1	3	4	8	6	3	3
.438	81	7.6	2.07	0.30	26th	19	0	2	3	3	15	0	2	0	1	2	8	9	4	3	2
.439	74	6.9	1.78	0.51	26th	19	0	1	4	4	13	0	1	1	2	3	6	10	5	2	1
.444	80	6.9	2.07	0.28	27th	13	0	1	3	4	11	0	0	0	3	2	6	11	4	3	2
.455	85	6.3	2.77	0.39	9th	20	0	0	1	3	3	2	1	3	2	2	1	11	7	3	1
.402	85	7.3	3.87	0.97	10th	23	0	1	3	6	17	1	1	6	5	3	7	4	2	2	1
.376	84	6.1	7.28	1.41	10th	26	0	0	4	6	11	0	0	0	5	1	6	11	3	3	2
.411	84	5.7	4.79	0.79	13th	22	0	0	4	10	12	2	3	4	3	6	5	5	2	3	0
.398	75	5.3	3.73	0.80	24th	21	0	0	3	8	7	0	1	0	0	9	6	6	7	1	1
.418	83	5.5	3.77	0.66	11th	22	0	0	2	6	9	0	2	0	0	1	9	11	3	2	3
.427	88	6.8	3.33	0.66	7th	24	0	0	0	3	13	0	1	1	0	7	4	5	8	5	0
.442	89	7.2	2.27	0.60	15th	19	0	0	3	5	17	0	1	2	2	4	6	9	4	3	0
.412	90	7.3	4.46	0.75	13th	22	0	0	1	4	14	0	4	0	2	2	10	2	9	2	0
.391	82	7.6	5.31	0.92	3rd	28	0	0	4	1	9	6	2	2	3	6	4	7	4	2	1
.387	81	7.0	3.21	0.45	7th	20	0	0	0	7	18	0	0	0	2	10	4	4	4	2	5
.439	89	7.7	6.95	1.75	13th	26	0	0	1	1	15	5	2	0	2	8	4	4	7	3	1
.434	87	6.7	2.77	0.45	9th	22	0	0	0	3	12	0	3	0	0	4	8	6	5	5	0
.445	83	7.8	4.78	0.95	14th	24	0	0	1	1	14	5	1	1	1	1	8	8	7	2	1
.475	88	7.2	1.71	0.29	15th	20	0	0	1	6	15	1	1	1	3	1	5	5	11	2	2

barometric readings at this station are not corrected for altitude.

TABLE XIV.

OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of July 1884.

STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per- centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Mini- mum.	Date.	Maxi- mum.	Date.			
STORNOWAY	*	*	*	*	*	*	*	*	163	31
ABERDEEN	*	*	*	*	*	*	*	*	141	27
ALNWICK CASTLE	52.2	64.0	58.1	39	27th	71	8th	4.09	—	—
SCARBOROUGH	54.1	65.6	59.9	45	20th, 26th	76	13th	2.29	—	—
YORK	*	*	*	*	*	*	*	*	143	28
HILLINGTON	52.4	73.5	63.0	41	26th	88	4th	3.12	170	34
GELDESTON	53.2	72.4	62.8	43	20th, 21st	82	5th	1.75	193	40
CAMBRIDGE	*	*	*	*	*	*	*	*	162	33
ROTHAMSTED	51.5	70.6	61.1	41	26th, 27th	83	4th	2.44	—	—
BAWTRY	51.7	72.8	62.3	41	20th	87	4th	2.65	—	—
LEICESTER	53.5	72.4	63.0	42	26th	86	3rd, 4th	2.31	138	28
BIRMINGHAM	†	†	†	†	†	†	†	†	—	—
CHEADLE	51.5	66.0	58.8	42	26th	75	3rd, 4th	3.23	—	—
CHURCHSTOKE	50.5	67.3	58.9	41	26th	76	3rd	2.89	152	30
HEREFORD	52.5	70.6	61.6	45	26th	78	3rd, 8th	2.97	—	—
CIRENCESTER	51.9	67.4	59.7	41	26th	76	8th	3.64	127	26
OXFORD	*	*	*	*	*	*	*	*	152	31
LONDON	*	*	*	*	*	*	*	*	140	29
MARLBOROUGH	53.1	69.4	61.3	40	26th	78	3rd	3.09	136	28
STRATHFIELD TURGIS	†	†	†	†	†	†	†	†	—	—
HASTINGS	56.6	67.1	61.9	47	26th	76	3rd, 8th	1.98	202	41
SOUTHAMPTON	55.5	70.4	63.0	44	26th	79	3rd, 8th	2.19	159	33
LAUDALE	†	66.2	†	†	†	77	4th	6.39	—	—
GLASGOW	52.2	64.5	58.4	43	20th	71	2nd, 3rd, 9th	5.95	108	21
SILLOTH	53.1	67.6	60.4	43	20th, 28th	78	3rd	8.10	160	31
DOUGLAS	51.9	63.8	57.9	44	3rd, 20th	72	4th	3.96	186	37
NEWTON REIGNY	50.3	66.4	58.4	39	20th	79	3rd	4.87	131	26
STONYHURST	53.0	66.4	59.7	45	19th, 26th	77	3rd	5.39	139	28
BLACKPOOL	53.6	66.2	59.9	45	28th	75	3rd, 4th, 5th	4.23	137	27
MANCHESTER	52.0	66.7	59.4	43	20th, 26th	78	3rd	4.51	—	—
LLANDUDNO	53.7	65.1	59.4	43	21st	72	5th	4.48	138	28
PEMBROKE	*	*	*	*	*	*	*	*	208	42
ARLINGTON	51.9	65.5	58.7	43	9th	72	31st	4.09	—	—
CULLOMPTON	52.6	68.0	60.3	42	26th	75	31st	2.94	152	31
FALMOUTH	56.0	65.2	60.6	51	26th	70	6th	4.61	214	44
PLYMOUTH	55.2	68.0	61.6	45	26th	73	2nd, 3rd, 31st	3.39	159	33
JERSEY	*	*	*	*	*	*	*	*	172	36
LONDONDERRY	52.0	67.7	59.9	45	19th, 20th	78	4th	2.64	—	—
MARKREE CASTLE	47.0	70.1	58.6	40	19th	72	3rd	4.40	139	28
BROOKEBOROUGH	50.3	65.2	57.8	42	19th	72	3rd	4.36	—	—
ARMAGH	52.7	65.2	59.0	46	19th, 25th	71	6th	3.74	143	28
DUBLIN	54.7	66.8	60.8	47	19th	71	4th, 5th, 30th	2.35	142	30
PARSONSTOWN	*	*	*	*	*	*	*	*	150	30
VALENCIA	*	*	*	*	*	*	*	*	151	31
FOYNES	51.6	65.4	58.5	45	7th	73	2nd, 31st	3.17	—	—

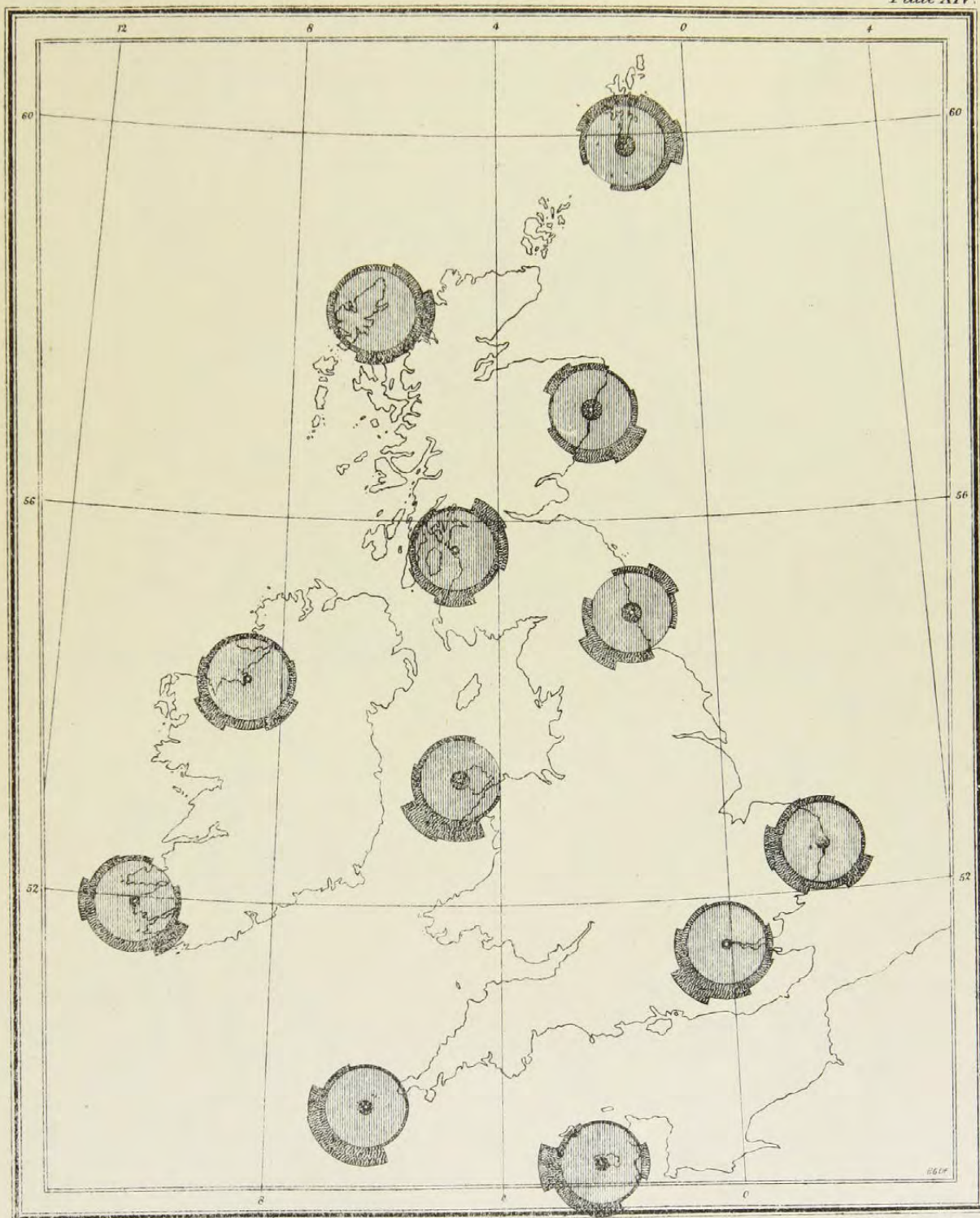
* Information found in Table XIII.

† Records incomplete.

‡ Records defective.

MONTHLY WIND CHART FOR JULY 1884.

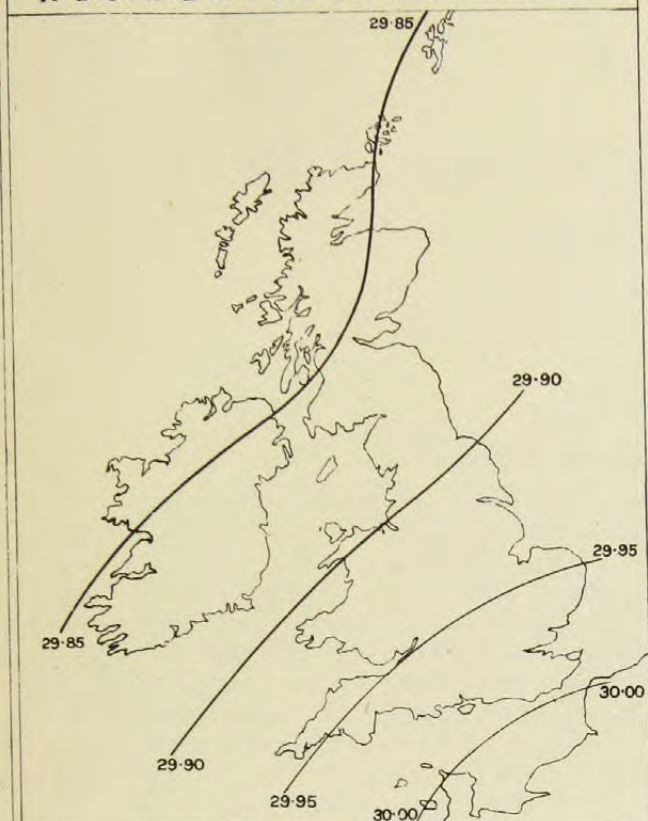
Plate XIV.



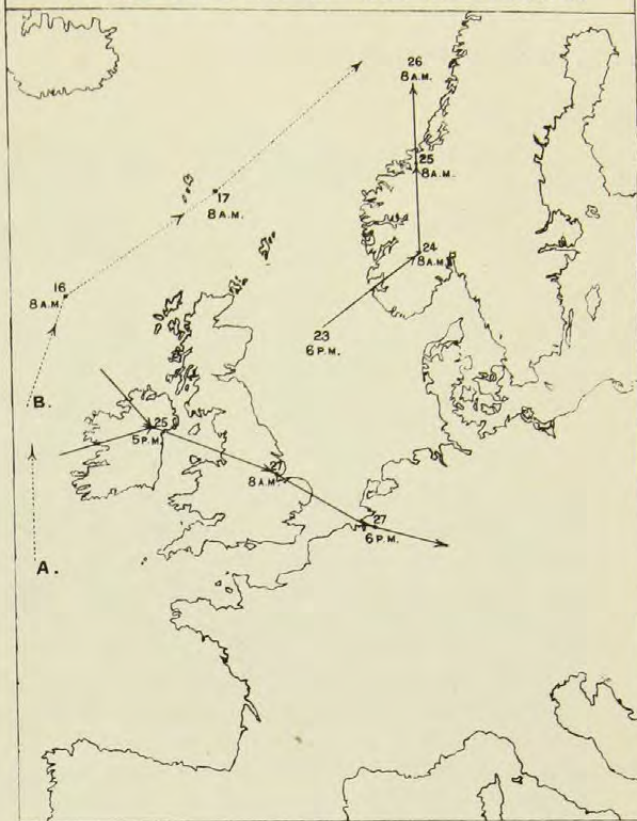
To face p. 76

DANCERFIELD LITH 22 BEDFORD ST COVENT GARDEN.

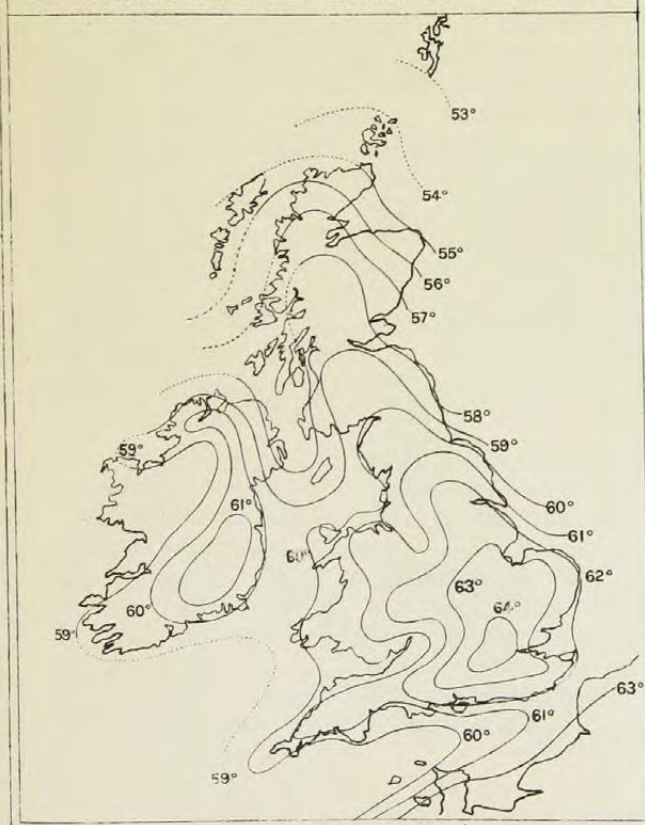
1. DISTRIBUTION OF MEAN PRESSURE



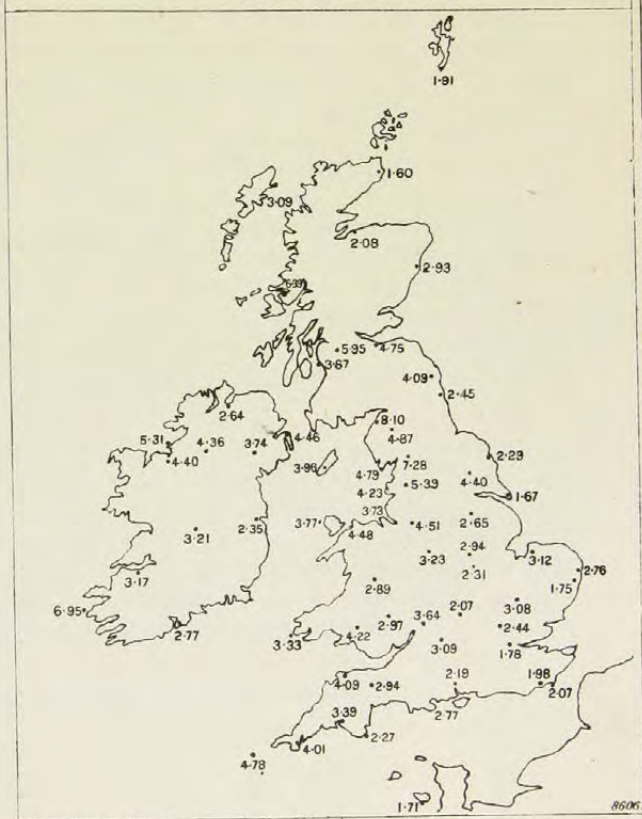
2. MOVEMENTS OF DEPRESSIONS.



3. DISTRIBUTION OF MEAN TEMPERATURE.



4. RAINFALL



MONTHLY WEATHER REPORT.

AUGUST 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather of August, taken as a whole, was quiet, bright, and warm; at times it was hot, especially over the southern and eastern parts of England. Pressure was about its average value, and its range was small; the depressions observed were shallow and their tracks lay uniformly at a great distance outside our extreme north-western coast, but subsidiary disturbances passed frequently over the kingdom, producing severe thunderstorms in all districts. Those experienced in the southern parts of Scotland and in the east of Norfolk on the 12th were exceptionally heavy, and resulted in great loss both of life and property. The highest temperatures recorded exceeded 90° over our south-eastern and eastern counties, while the lowest were below 40° in a few localities. The winds varied greatly in direction between South-west and South-east, and were moderate to light in force; the gales reported were slight, and were chiefly Southerly in direction, and were confined almost entirely to our extreme west and north-west coasts. After the 24th the fine weather broke up abruptly, and cold autumnal winds and showers set in.

August 1-3.—At 8 a.m. on August 1st a band of rather high and uniform pressure lay from north to south over Norway, the North Sea, and France, separating a depression which had been lying over the Baltic for a few days from a new one (No. XLV.*), which was advancing towards our western coasts from the Atlantic. The gradients over our Islands were favourable for Southerly and South-easterly winds, moderate in the west, slight in the east; and while winds from these points prevailed at our western stations, accompanied by cool and somewhat showery weather, variable airs were experienced over England and the east of Scotland, with fine weather and high temperature. In the course of the day the thermometer rose to between 80° and 84° over England, and the South-easterly breeze spread eastwards to our inland stations, where, however, it was very light in force. In the course of the 2nd and 3rd the depression in the west moved away to the north-eastward, and the barometer rose in its rear; on the 2nd the wind veered to South-west, and temperature again increased greatly over our inland counties during the daytime, but on the 3rd the heat was not so great, as the wind had veered towards West in places.

August 4-6.—A small but well-marked anticyclone (No. XV. p. 81) now began to approach us from the south-westward. The barometer rose steadily; the wind over our Islands veered to West more generally, and to North-west in places, and fell very light, but the thermometer did not rise above 73° at any of our stations until after the centre had passed to the eastward. Then, as the wind drew into South-east and South, the heat increased, so that on the 5th several of the shade maxima recorded over England were as high as 74° to 77° , increasing to 76° and 80° on the 6th. The weather was somewhat hazy, but dry.

* See Section II. and Map 2 Plate XVII. for the history and tracks of depressions.

August 7-11.—During this period the type of pressure distribution over the United Kingdom and its neighbourhood was Southerly, barometric readings being highest to the eastward of the North Sea, lowest to the westward of Ireland, and the gradients slight. At first fine warm weather prevailed very generally, maximum readings being recorded over England as high as 85° to 88° on the 8th, and 89° to 93° on the 11th. On the evening of the 9th, however, some thunder and lightning were experienced in the extreme west and north-west, and these spread gradually to the eastward and southward, accompanied at times by more or less rain. On the 11th thunder and lightning were observed, even over the south-eastern parts of England, but on that day the rainfall was less general than on the 10th. This unsettled weather appeared to be related to a very shallow but moderate-sized depression, the first indications of which were seen in a gradual giving way of pressure over the United Kingdom on the 9th and 10th, but which assumed no definite form till the 11th, when it appeared over Ireland and Scotland as a very shallow "hollow" lying between a high-pressure area over northern Europe and another over the Atlantic to the south-westward of our Islands. Its form was, however, too indefinite and its movement too uncertain for it to be included in the Table of Cyclonic Systems on page 80, or for its track to be drawn on Map 2, Plate XVII.

August 11-13.—The distribution of pressure during these three days was very complex, the "hollow" referred to above having become the dominant system over the United Kingdom, while the barometer was high both over northern Europe and to the south-westward of the British Islands. South-westerly and Westerly winds were experienced on our western and southern coasts, while South-easterly to North-easterly winds were felt over the North Sea. Temperature fell rapidly, especially on the 12th, and thunderstorms were experienced, particularly in Scotland, where, as well as in the east of Norfolk, the storms were very violent, and the rainfall was heavy. From this date, however, the weather began to improve, the "hollow" moved slightly to the north-eastwards and began to disperse, and a South-westerly and Southerly current of wind spread completely over the kingdom.

August 14-17.—During this time pressure recovered and barometric readings became more uniform, the conditions being favourable for Southerly winds, of little strength, even at the western stations. The weather became still better, and, except over the extreme western and north-western districts, was rainless. On the 16th the thermometer again rose over the inland counties of England to between 75° and 80° in the shade, and on the 17th to between 80° and 84° , the Irish and Scotch stations showing much lower values generally. On the 17th, however, some shallow local disturbances were developed over France, where they produced thunderstorms and rain, and these subsequently spread to the southern counties of England.

August 18-19.—A clearly marked, but shallow depression (No. XLVI.*) now reached our north-western coasts, and, in union with the shallow disturbances just referred to, developed a new arm (or "hollow") of low pressure over the country generally, bringing rain, thunder, and lightning to all districts, with a fresh fall of the thermometer. The whole system, however, was slight, and as it passed off a new anticyclonic system (No. XVI.) appeared in the south-west, and advanced over the United Kingdom.

August 20-23.—This period was anticyclonic. The system appeared off our south-western coasts and the Bay of Biscay on the 20th (see page 81), and, passing in a north-easterly direction, reached the eastern shores of the North Sea on the 22nd. It then increased in size, and formed one of those large and more permanent high-pressure areas which occasionally continue over Europe for lengthened periods producing a corresponding permanence in our weather. As no new system appeared for some time, the distribution of pressure from the 22nd to the 24th, inclusive, was again favourable for the prevalence of gentle Southerly breezes. The weather was consequently fine and bright, the air dry, and the thermometer continued to rise from day to day, so that the highest of the daily maximum

* See Section II. and Map 2 Plate XVII. for the history and tracks of depressions.

readings over England varied from 80° to 84° on the 22nd, from 80° to 86° on the 23rd, and from 85° to 90° early on the 24th. This, however, was the last spell of really hot weather experienced during the summer, for showers and local thunderstorms now appeared in the north, and soon spread to all parts of our Islands.

August 24-29.—This was a period of complex distribution of pressure, very variable winds, cool, wet weather, and local thunderstorms. On the morning of the 24th (the high-pressure area in the east being still unchanged), a new and decided anticyclonic system appeared in the west, following closely in the rear of cyclonic system No. XLVII.* as it passed away to the northward of Scotland. The new anticyclone was of moderate height, and as its centre remained outside our western coasts, its eastern side brought over us a spell of brisk cold winds from North-west and North, which, impinging on the warm Southerly current hitherto existing, produced a series of local disturbances, accompanied by heavy clouds, squally weather, much rain, and occasional thunder in all parts of Great Britain. The fall of temperature was remarkable; in London the thermometer at 2 p.m. on the 25th was no less than 27° lower than it was at the same hour on the previous day, and the air felt peculiarly keen and searching. This North-westerly wind remained with us for several days, and although there was subsequently a considerable amelioration of its temperature and weather, the thermometer continued low for the time of year, rain was frequent and, at times, heavy.

August 30-31.—The disturbances just referred to now began to disperse; the barometer rose, the wind backed to between West and South on all our coasts, and temperature increased. In the north the weather improved a little, but over England rain still fell in heavy showers, and the appearance of the sky was far from being settled.

* See Section II. and Map 2 Plate XVII. for the history and tracks of depressions.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—AUGUST, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XLV. August 1-3.	No. XLVI. August 18-19.	No. XLVII. August 22-27.	No. XLVIII. August 27-29.
Form - - - -	Very uncertain; apparently circular.	Apparently nearly circular	Apparently nearly circular	Apparently nearly circular at first, then uncertain.
Size - - - -	Apparently large	Apparently moderate	Large	Large.
Depth - - - -	Apparently moderate	Apparently shallow	Uncertain, but apparently shallow.	Uncertain; apparently shallow to moderate.
Where first Observed -	Off the west of Ireland	Off the north-west coast Ireland.	Off the west of Scotland	Off the west of Scotland.
Direction of Motion -	About north-north-easterly	About north-east	Northerly and north-easterly	Very uncertain at first (if any), then north-easterly and northerly.
Rate of Motion - -	Slow	Moderate	Very slow	Very slight.
Regions passed over by Steepest Gradients.	Ireland and west of Scotland	The northern and north-western parts of our Islands.	Our extreme north-west coasts	British Islands.
Termination - -	Travelled away to the northward.	Travelled away to the northward.	Dispersed over Norway on the 27th, after undergoing great modifications in form.	Passed away to the northward.
Time under observation -	About three days	Two days	About six days	Three days.
Accompanying Winds -	South-east to South-west and West.	Southerly to Westerly, moderate to strong.	Southerly and South-westerly at the north-western and northern stations only; force moderate.	Southerly in the north, South-westerly to North-westerly in the west.
„ Weather	Squally and showery in the western district; fair in the east.	Gusty and showery	Slightly showery in north and north-west.	Squally, rainy, and cold.
„ Rainfall -	Slight	Moderate; confined to our western districts at first, but subsequently spreading to England.	Confined to extreme north-western and northern stations.	Very general and in many places heavy.
REMARKS -	<p>This depression reached our western coasts while a band of high pressure (30.1+) lay from north to south over Norway and the North Sea, separating this disturbance from another, the centre of which lay over the southern part of the Baltic. The latter subsequently moved eastwards over the Baltic provinces of southern Russia and dispersed.</p> <p>The centre of this disturbance lay at too great a distance from our western coasts for its track to be very accurately drawn on Map 2, Plate XVII. In its rear a well-formed anticyclone (No. XV.) advanced over our Islands and France from the south-westward.</p> <p>An arm of low pressure (or "hollow") was developed on the south-eastern side of this disturbance after it reached our north-west coasts, and in this thunderstorms and showers occurred and spread almost all over the kingdom.</p> <p>This depression advanced when pressure was highest over Scandinavia and the North Sea. Its movements were extremely slow, and after the centre reached Norway, the system underwent some remarkable modifications in form. It broke up on the approach of cyclonic system No. XLVII.</p> <p>In its rear the barometer rose fast, and anticyclone No. XVII. advanced to our western stations. Between this and the previously existing anticyclone a long arm (or "hollow") of low pressure was formed which for a time appeared subsidiary to the cyclonic system now under discussion. (See page 79.)</p> <p>This depression advanced when pressure was highest to the south-westward, and lowest, in a depression, to the north-eastward of the United Kingdom.</p> <p>On arriving off our north-west coast, it apparently became stationary for a time, and on the breaking up of System No. XLVI., developed an arm or hollow of low pressure over Great Britain and the North Sea, causing strong, cold North-westerly breezes over Ireland and England, with very wet, unsettled weather, and lightning. As the centre moved away the hollow dispersed and the weather improved.</p>			

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS.—AUGUST, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XV. August 4-6.	No. XVI. August 20-22.	No. XVII. August 24-27.
Form - - - - -	Nearly oval - - - - -	Apparently nearly circular at first; very variable later.	Irregular, and very variable.
Size - - - - -	Small at first, then large - - -	Small - - - - -	Uncertain; apparently large.
Height - - - - -	Small - - - - -	Very small - - - - -	Unknown; apparently moderate.
Where first observed - - -	To the south-westward of our Islands	Over the Bay of Biscay - - -	To the westward of Ireland.
Direction of Motion - - -	North-easterly - - - - -	North-easterly - - - - -	Very irregular; apparently easterly at first, then stationary, and finally southerly.
Rate of Motion - - - - -	Moderate - - - - -	Moderate - - - - -	Very slow.
Regions passed over - - -	Bay of Biscay, France, the British Islands.	Bay of Biscay, France, and British Islands.	Western parts of our Islands and Bay of Biscay.
Termination - - - - -	Developed into a large permanent high-pressure area over Germany, the Baltic, and northern Europe.	Developed into a large permanent high-pressure area over the Baltic and Germany, and subsequently moved very slowly to Russia.	Uncertain. Remained to the westward of the peninsula for some days.
Accompanying Winds - - -	Very light; Westerly, backing to South-west and South on its northern side, Easterly (North-east to South-east) in the south.	Light and very variable at first, subsequently becoming Easterly in France and the south of our Islands, and Southerly elsewhere.	North-westerly and Northerly.
Weather - - - - -	Very fine and warm; hazy locally -	Fine, but hazy, and not very warm until the system had passed to the eastward of the North Sea.	Cold; changeable; thundery.
REMARKS - - - - -	This system brought with it the first really settled weather which had been experienced since the earlier half of July. The maximum temperatures, however, did not rise above 80° until the system had reached the eastern shores of the North Sea.	This system underwent great modifications in its form as it passed over. On the 21st its central area was in two parts, one of which lay over our southern and south-western districts, while the other lay off the north-west of Ireland. On the 22nd also there were two maxima, but their relative (as well as their actual) positions were much changed.	This system advanced in the rear of a shallow depression (No. XLVII.), the centre of which passed north-eastwards outside our extreme north-western coasts on the 22nd—23rd. Anticyclone No. XVI. still lay to the eastward of the North Sea, and the mingling of the cold Northerly and North-westerly winds of the new system with the hot Southerly winds of the old one brought about a complete break up of the summer weather hitherto prevailing over England. See further details on p. 79.

SECTION III.

REMARKS FOR AUGUST 1884.

(Tables XV. and XVI. with Plates XVI. and XVII.)

Pressure.—The mean pressure at 8 a.m., as shown by Map 1, Plate XVII., varied from nearly 30·03 inches over our southern and south-eastern counties to 29·83 inches at Stornoway, the gradients being steeper in the north-west than they were over England. These conditions are favourable for South-westerly and Southerly winds, and a mere glance at the wind-roses on Plate XVI. will show how largely those winds prevailed. Compared with the mean distribution for the corresponding month in the 20 years, 1861–80, the map shows an excess of pressure in almost all parts of the kingdom, amounting to about 0·06 inch over Great Britain, but only to 0·03 inch over the north-west of Ireland; in the Hebrides the average values and those for August 1884 are almost identical. In Ireland the highest readings (30·3+) were recorded on the 25th or 26th, during the prevalence of anticyclone No. XVII., but in England the highest appear to have occurred on the 4th or 5th, while anticyclone No. XV. was travelling over the country; in Scotland, however, the highest (30·2+) were recorded on the 21st or 22nd, the anticyclone No. XVI. having extended further to the northward than either of the other similar systems observed during the month. The lowest readings recorded occurred in almost all places on the 28th or 29th, under the influence of depression No. XLVIII.* The range of pressure during the month was small and the variations very gradual.

Movements of Depressions.—The principal depressions observed during August were four in number (see the Table of Cyclonic Systems on page 80 and Map 2, Plate XVII.), and their centres all moved in about a north-easterly direction at a considerable distance to the north-westward of the Irish and Scotch coasts. In each case, however, a subsidiary arm or hollow of low pressure was developed over our Islands as the centre of the main body moved by, and in these thunderstorms, often of great severity, were developed in all parts of the kingdom. Both the depressions themselves and their subsidiary arms were very shallow, as is common with the disturbances of summer time, and their movements were slow.

Anticyclones.—These were three in number (see page 81). They were well defined, but, except in the case of No. XVII., their height was slight. The two first advanced towards our Islands from the south-westward, bringing with them the quiet, fair weather which is usual with such systems at this time of year; then passing to the eastward of the North Sea, they developed into the larger and more permanent form of high-pressure systems which are observed from time to time over Continental Europe, and continued for several days. One of them, however, (No. XVII.) advanced only to the neighbourhood of our western coasts, and its gradients being steeper than those of the other systems, it brought about a spell of cold North-westerly winds, which completely broke up the fine hot weather which had prevailed (see pages 79 and 80, and the Daily and Weekly Reports for the latter half of August).

Winds.—These, as may be gathered from the statements made in Section I. of this Report, were chiefly Westerly at the mouth of the Channel, South-westerly on our western coasts, and Southerly in the north, but a considerable proportion of South-easterly wind was experienced at our eastern stations, and Easterly wind in the Channel. In force the winds were generally light to moderate, but at times they blew somewhat strongly from the South-eastward, Southward, and South-westward at our western stations, as the various depressions passed by. It was under these conditions that the few gales mentioned in Table XV., for Stornoway, Mullaghmore, and Valencia were experienced; those at Hurst Castle were from a more Westerly quarter, and occurred quite locally on the 30th and 31st.

Temperature.—The mean (sea level) temperature of Great Britain for the month varied from a little above 66° in the neighbourhood of London to between 61° and 62° over the north

* See Section II. and Map 2 Plate XVII. for the history and tracks of depressions.

of England, to somewhat above 60° over Scotland and to a little above 55° at the extreme southern point of the Shetlands. In all cases the inland stations were much warmer than those on the coasts, especially as regards the stations in the south-eastern and midland counties, as compared with those lying on the eastern shores of the St. George's Channel. In Ireland the mean values vary from between 60° and 62° over the eastern provinces, to somewhat below 58° in the west. Thus the temperature of the month was higher than its average value by three degrees over the home counties, and by about two or two and a half degrees over our northern districts; in the east of Ireland the excess was so slight as to be hardly appreciable, while in the western provinces there was an actual deficit of rather more than a degree. Over the major part of Great Britain the highest readings were registered on the 11th, but at many of the stations over our north-western and north midland counties on the 8th. In Ireland, however, and at some of the north British stations the maxima occurred on the 23rd, but the readings were lower by more than 15° than those registered over the eastern and south-eastern counties of England. The minima were recorded in almost all parts of the kingdom during the cold period which prevailed between the 25th and 29th. The range was large at the English stations, especially in the east and south-east—at Cambridge it amounted to 48° .

Vapour Tension was lowest inland, highest on the coasts, and varied from about 0.38 inch over central Scotland, 0.39 inch over Ireland, and 0.40 inch over the north-west of England, to 0.47 inch in the extreme south of England, and to 0.49 inch in the Channel Islands. *Relative Humidity* also was lowest inland, but the values were comparatively uniform between 75 and 87.

Rainfall—This was, as a rule, below the average; it was very slight until the 24th, except on one or two occasions, when thunderstorms produced some heavy falls locally, *e.g.*, in the south of Scotland and the east of Norfolk on the 12th. The smallest aggregates for the month occurred in the north-east of England (0.65 inch at Shields and 0.86 inch at Alnwick Castle), and in the east and south-east of Ireland (0.78 inch at Dublin, 0.90 inch at Kilkenny, and 0.92 inch at Roche's Point). The largest amounts collected were 3.70 inches at Mullaghmore, 4.09 inches at Stornoway, 4.23 inches at Valencia, 4.73 inches at Arlington (North Devon), and 6.71 inches at Laudale.

Bright Sunshine.—Assuming that the total possible duration of sunshine at each station is represented by 100, the percentage actually recorded was largely in excess of that noted in July. The values ranged from 59 at Jersey, and 50 to 52 in the more southern and eastern parts of England, to between 40 and 47 in most other places. In the north of Ireland and the west of Scotland, however, it was as low as 20 to 27.

TABLE XV. - - - - -

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
 Observations are made at 8 a.m. daily, but the Numbers of Days of Rain, Snow, Hail,
 (The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head - - -	ins. 29° 889	55° 1	50° 2	59° 7	55° 0	41	27th	65	18th
	Wick - - -	29° 886	56° 5	50° 5	64° 1	57° 3	37	27th	73	6th
	Stornoway - - -	29° 827	55° 8	50° 5	61° 8	56° 2	41	27th	71	9th
1. SCOTLAND, E.	Nairn - - -	29° 882	58° 2	52° 6	67° 2	59° 9	40	27th	77	9th, 10th
	Aberdeen - - -	29° 927	58° 2	50° 9	66° 1	58° 5	40	29th, 30th	71	11th, 14th, 16th, 17th, 18th, 23rd.
	Leith - - -	29° 932	59° 0	52° 4	67° 3	59° 9	44	29th	80	
2. ENGLAND, N.E.	Shields - - -	29° 975	58° 1	52° 2	66° 3	59° 3	42	26th	79	24th
	York - - -	30° 001	60° 1	52° 9	74° 0	63° 5	43	26th	87	11th
	Spurn Head - - -	30° 000	60° 6	56° 6	66° 7	61° 7	49	26th	76	2nd
3. ENGLAND, E.	Yarmouth - - -	30° 010	63° 3	58° 2	68° 3	63° 3	44	27th	75	13th
	Cambridge - - -	30° 014	62° 5	52° 6	76° 4	64° 5	43	26th, 27th	91	11th
4. MIDLAND COUNTIES	Loughborough - - -	30° 013	59° 8	52° 3	74° 6	63° 5	42	5th	89	8th, 11th
	Oxford - - -	30° 024	61° 1	54° 0	73° 9	64° 0	45	26th	89	11th
5. ENGLAND, S.	London - - -	30° 032	64° 2	54° 8	76° 9	65° 9	47	26th	92	11th
	Dungeness - - -	30° 024	64° 2	57° 2	70° 2	63° 7	46	26th	78	9th
	Hurst Castle - - -	30° 027	63° 6	56° 1	72° 3	64° 2	46	26th, 27th	81	8th, 9th, 10th, 11th.
6. SCOTLAND, W.	Ardrossan - - -	29° 931	58° 9	54° 2	64° 5	59° 4	45	20th	76	8th
7. ENGLAND, N.W.	Hawes Junction* - - -	28° 780	57° 5	49° 6	65° 0	57° 3	38	26th	78	8th
	Barrow-in-Furness - - -	29° 970	59° 5	56° 3	67° 3	61° 8	50	29th	80	8th
	Liverpool - - -	29° 983	61° 6	55° 8	70° 1	63° 0	47	29th	85	24th
	Holyhead - - -	29° 987	60° 6	55° 3	66° 6	61° 0	50	29th	79	1st
8. ENGLAND, S.W.	Pembroke - - -	29° 996	60° 3	56° 7	64° 8	60° 8	51	26th	73	23rd
	Prawle Point - - -	30° 028	63° 5	56° 6	68° 5	62° 6	48	26th	79	11th
9. IRELAND, N.	Donaghadee - - -	29° 953	57° 6	52° 2	64° 2	58° 2	43	29th	71	23rd
	Mullaghmore - - -	29° 907	57° 4	54° 4	64° 5	59° 5	49	28th, 29th, 30th	74	1st
10. IRELAND, S.	Parsonstown - - -	29° 973	57° 0	51° 4	67° 1	59° 3	40	25th	76	9th, 10th
	Valencia - - -	29° 972	58° 9	54° 0	63° 7	58° 9	47	9th	69	23rd
	Roche's Point - - -	29° 996	59° 9	54° 5	66° 8	60° 7	48	26th	73	23rd
CHANNEL ISLANDS	Scilly (St. Mary's) - - -	30° 007	62° 8	57° 7	66° 8	62° 3	53	29th	72	7th
	Jersey (Noirmont) - - -	30° 031	64° 5	58° 5	71° 4	65° 0	50	22nd	86	10th

* Hawes Junction is 1,135 feet above the Mean Sea Level and the

TABLE XV.

REPORTING STATIONS in the BRITISH ISLANDS, during the Month of August 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred.

(beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calms.
ins.	%		ins.	ins.																	
391	90	6.8	2.04	0.70	13th	14	0	0	0	5	12	1	2	0	2	7	10	2	6	0	2
398	87	6.6	3.01	0.75	12th	16	0	0	1	3	13	0	0	0	2	2	13	5	4	3	2
390	87	7.5	4.09	0.69	10th	23	0	1	2	5	17	5	1	0	1	2	16	4	3	1	3
380	78	5.8	1.38	0.55	12th	11	0	0	2	9	12	1	0	0	1	1	2	8	3	1	15
396	81	5.4	2.08	0.73	28th	14	0	1	2	12	10	0	2	0	0	2	15	6	2	2	2
380	76	5.0	2.03	1.63	12th	11	0	0	4	9	4	0	1	2	3	5	1	6	8	4	1
406	83	7.5	0.65	0.25	24th	8	0	0	2	4	14	0	0	1	1	4	5	10	5	0	5
416	80	5.2	1.25	0.69	31st	10	0	0	0	12	6	0	3	1	1	2	8	2	8	5	1
476	90	3.5	1.81	0.66	9th	9	0	0	2	14	3	0	1	1	4	8	2	3	6	5	1
483	82	2.7	2.90	1.85	12th	10	0	1	1	20	3	0	2	0	6	6	4	2	4	6	1
458	81	3.8	1.63	0.40	27th	13	0	0	3	18	9	0	7	1	2	2	12	1	4	0	0
426	83	6.2	1.75	0.92	31st	8	0	0	1	5	11	0	1	2	3	4	2	2	10	3	4
432	80	4.3	1.47	0.56	31st	11	0	0	1	17	8	0	2	1	1	2	3	8	4	1	9
452	75	4.1	0.93	0.27	27th	9	0	0	0	15	6	0	2	0	5	4	2	8	6	3	1
467	78	4.0	1.40	0.38	27th	9	0	0	1	12	5	0	1	3	3	3	1	5	4	5	6
482	82	3.9	1.65	0.87	27th	8	0	0	2	15	1	2	2	8	4	2	1	3	7	3	1
444	90	6.4	3.75	1.50	12th	18	0	0	1	9	14	1	1	4	4	2	5	5	3	1	6
396	83	4.4	1.67	0.49	27th	12	0	0	3	15	10	0	1	5	2	2	5	8	5	3	0
421	83	5.2	1.41	0.47	27th	9	0	0	1	8	6	0	1	9	1	6	2	3	5	4	0
400	74	4.8	2.39	0.78	27th	11	0	0	1	12	8	0	0	1	2	11	4	5	6	2	0
433	82	5.0	1.30	0.50	10th, 27th	9	0	0	1	8	3	0	1	0	1	0	11	10	4	3	1
437	84	6.8	1.55	0.56	30th	12	0	0	0	3	8	1	2	0	8	3	2	3	8	4	1
470	80	4.0	1.47	0.68	31st	11	0	0	2	14	6	0	3	6	7	0	0	4	7	1	3
422	89	7.0	1.73	0.88	27th	13	0	0	1	3	13	0	4	2	1	0	6	4	10	4	0
392	83	7.8	3.70	0.89	16th	21	0	0	0	1	10	4	0	0	3	1	8	8	8	3	0
394	85	7.4	1.34	0.36	16th	12	0	0	0	4	18	0	1	0	0	4	6	5	5	0	10
426	87	8.2	4.23	0.65	15th	22	0	0	0	1	18	3	3	0	0	4	6	7	5	3	3
433	85	6.3	0.92	0.23	27th	12	0	0	1	5	8	0	3	1	0	3	4	5	11	4	0
465	81	6.7	2.25	0.82	31st	13	0	0	0	4	9	2	4	1	5	2	3	5	6	3	2
489	81	4.5	1.24	0.26	13th	10	0	0	4	13	9	3	1	4	6	1	0	5	6	4	4

Barometric readings at that station are not corrected for Altitude.

TABLE XVI.

OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of August 1884.

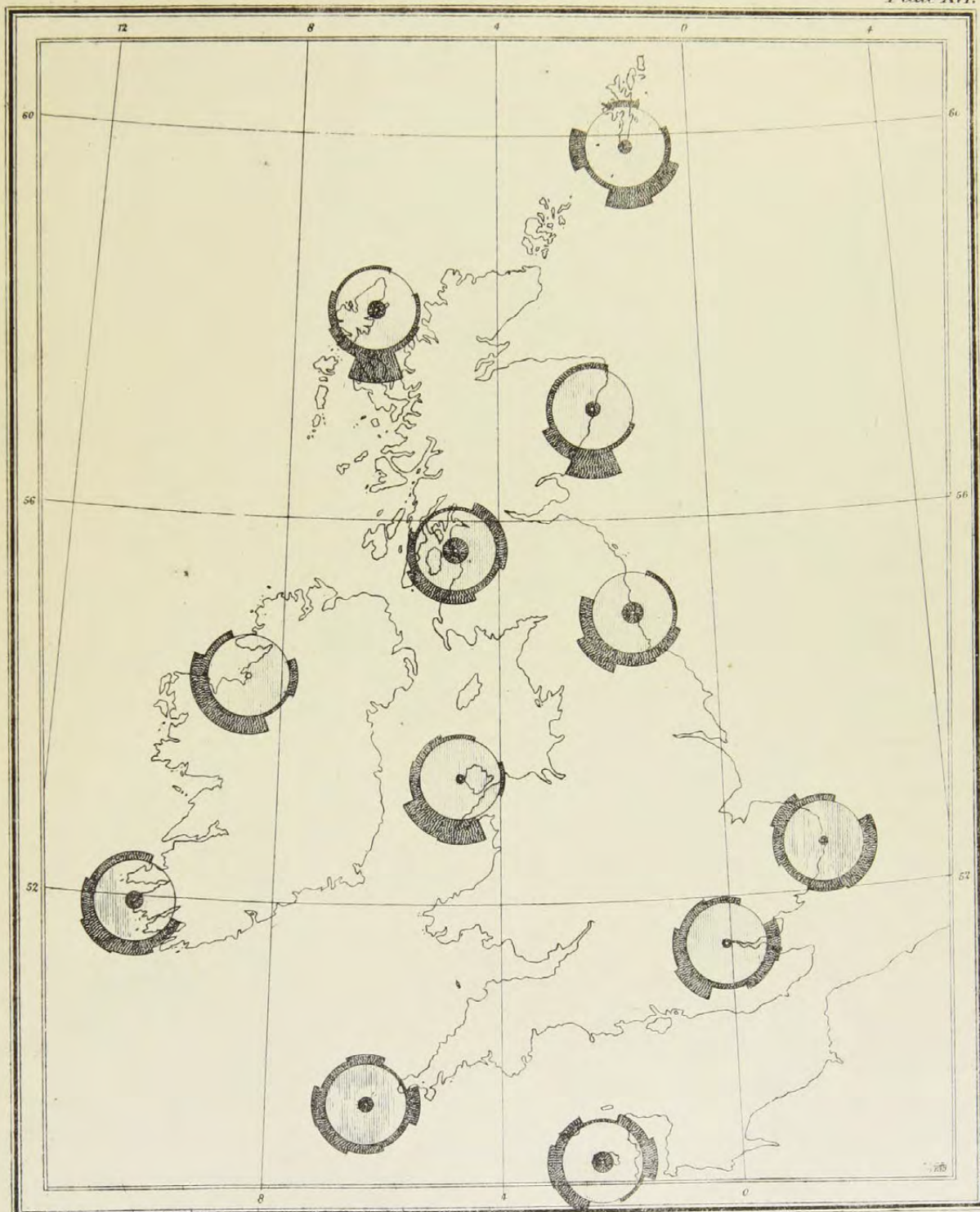
STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per-centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Mini-mum.	Date.	Maxi-mum.	Date.			
STORNOWAY - -	°	°	°	°	*	°	*	*	99	21
ABERDEEN - -	*	*	*	*	*	*	*	*	182	39
ALNWICK CASTLE -	51°6	65°6	58°6	43	28th, 29th	77	24th	0°86	—	—
SCARBOROUGH - -	54°6	67°4	61°0	47	26th	76	13th	1°54	—	—
YORK - - -	*	*	*	*	*	*	*	*	193	42
HILLINGTON - -	53°2	76°9	65°1	38	27th	93	11th	1°96	222	49
GELDESTON - -	53°0	73°4	63°2	41	27th	86	11th	1°07	229	51
CAMBRIDGE - -	*	*	*	*	*	*	*	*	229	51
ROTHAMSTED - -	51°5	73°9	62°7	43	5th	87	11th	1°59	—	—
BAWTRY - - -	51°2	76°5	63°9	40	5th, 19th	92	11th	1°20	—	—
LEICESTER - -	52°7	74°9	63°8	42	26th	90	8th, 11th	2°23	212	47
CHEADLE - - -	52°2	69°9	61°1	42	26th	83	11th	2°73	—	—
CHURCHSTOKE - -	49°9	71°8	60°9	40	5th	86	11th	1°71	211	47
HEREFORD - -	51°0	74°7	62°9	41	26th	88	11th	1°96	—	—
CIRENCESTER - -	48°9	71°2	60°1	42	5th, 24th	84	11th, 24th	2°13	220	49
OXFORD - - -	*	*	*	*	*	*	*	*	232	52
LONDON - - -	*	*	*	*	*	*	*	*	209	47
MARLBOROUGH - -	51°1	74°0	62°6	41	26th	88	8th	1°25	222	50
STRATHFIELD TURGIS -	†	†	†	†	†	†	†	†	†	†
HASTINGS - - -	58°5	72°3	65°4	49	26th, 27th	84	8th, 11th	1°21	267	60
SOUTHAMPTON - -	54°7	75°4	65°1	46	26th, 27th	87	8th, 11th	1°27	245	55
LAUDALE - - -	52°8	64°7	58°8	44	29th	76	15th, 16th	6°71	—	—
GLASGOW - - -	52°7	65°3	59°0	43	29th	77	10th	2°62	111	24
SILLOTH - - -	52°7	69°8	61°3	42	20th	84	8th	1°55	177	39
DOUGLAS - - -	50°9	65°6	58°3	43	20th, 26th, 29th.	75	8th	1°52	188	41
NEWTON REIGNY - -	49°4	68°1	58°8	39	26th	81	8th	1°13	172	37
STONYHURST - -	52°5	69°1	60°8	42	26th	81	11th	2°64	192	42
BLACKPOOL - -	53°2	68°3	60°8	44	5th	83	8th	1°25	191	42
MANCHESTER - -	53°2	70°3	61°8	41	26th	83	8th, 11th, 24th	2°14	—	—
LLANDUDNO - -	55°4	69°2	62°3	48	5th	81	8th	1°03	200	44
PEMBROKE - - -	*	*	*	*	*	*	*	*	221	49
ARLINGTON - -	52°2	69°1	60°7	42	5th, 26th	81	7th	4°73	—	—
CULLOMPTON - -	50°5	71°9	61°2	41	26th, 27th	84	8th	1°87	210	47
FALMOUTH - - -	57°2	67°5	62°4	51	26th	75	11th	1°83	217	49
PLYMOUTH - -	56°2	68°9	63°0	46	26th	80	10th	1°24	232	52
JERSEY - - -	*	*	*	*	*	*	*	*	258	59
LONDONDERRY - -	52°5	67°2	59°9	45	20th, 29th	77	12th	3°10	—	—
MARKREE CASTLE - -	50°6	65°3	58°0	43	21st, 29th	76	1st	2°94	123	27
BROOKBOROUGH - -	51°4	65°6	58°5	39	29th	75	8th, 9th, 12th	2°73	—	—
ARMAGH - - -	53°3	65°8	59°6	43	29th	74	12th	2°39	112	25
DUBLIN - - -	55°2	67°8	61°5	45	26th, 29th	75	12th, 17th	0°78	183	40
PARSONSTOWN - -	*	*	*	*	*	*	*	*	144	32
VALENCIA - - -	*	*	*	*	*	*	*	*	134	30
FOYNES - - -	50°2	64°2	57°2	47	10th	75	7th	1°36	—	—

* Information to be found in Table XV.

† Records incomplete at present.

MONTHLY WIND CHART FOR AUGUST 1884.

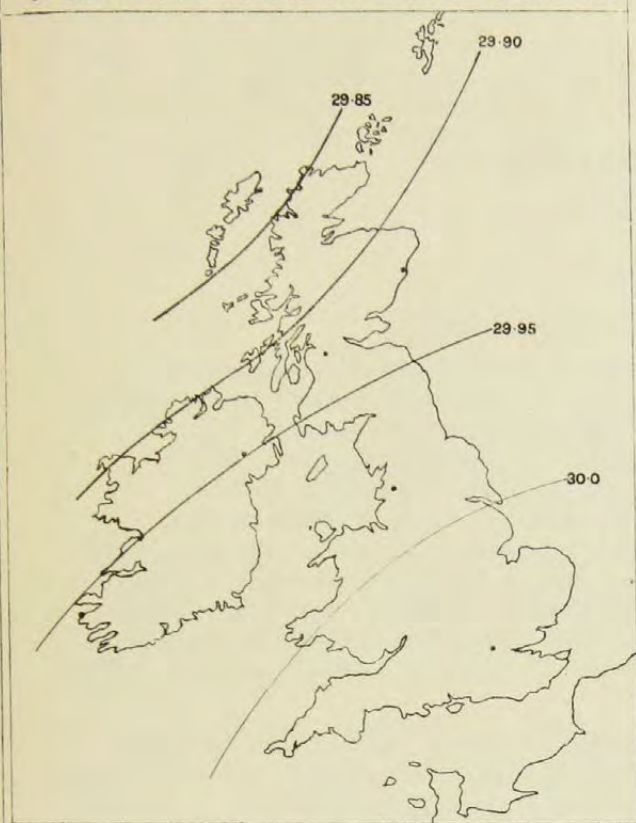
Plate XVI.



To face p. 86.

DANCERFIELD LITH. 22 BEDFORD ST. COVENT GARDEN.

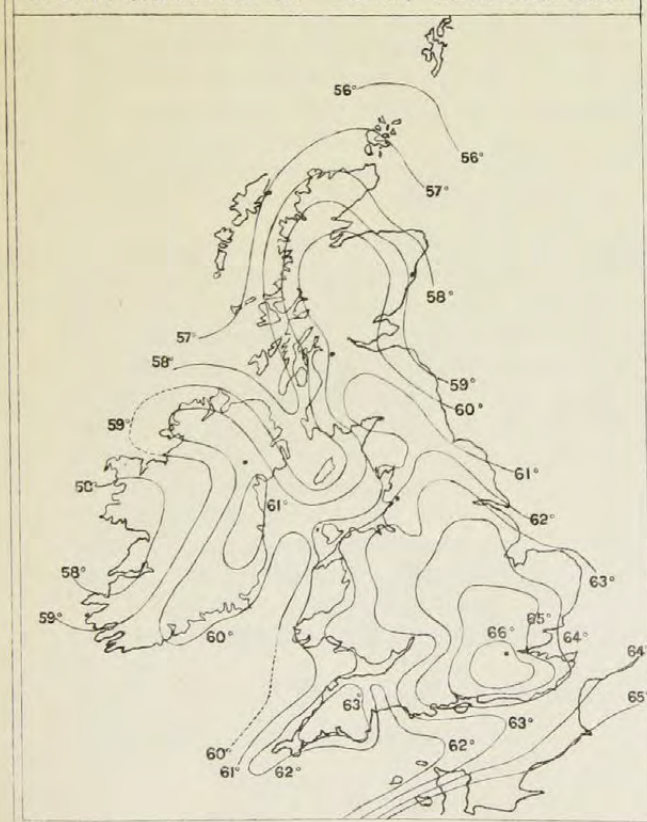
1. DISTRIBUTION OF MEAN PRESSURE



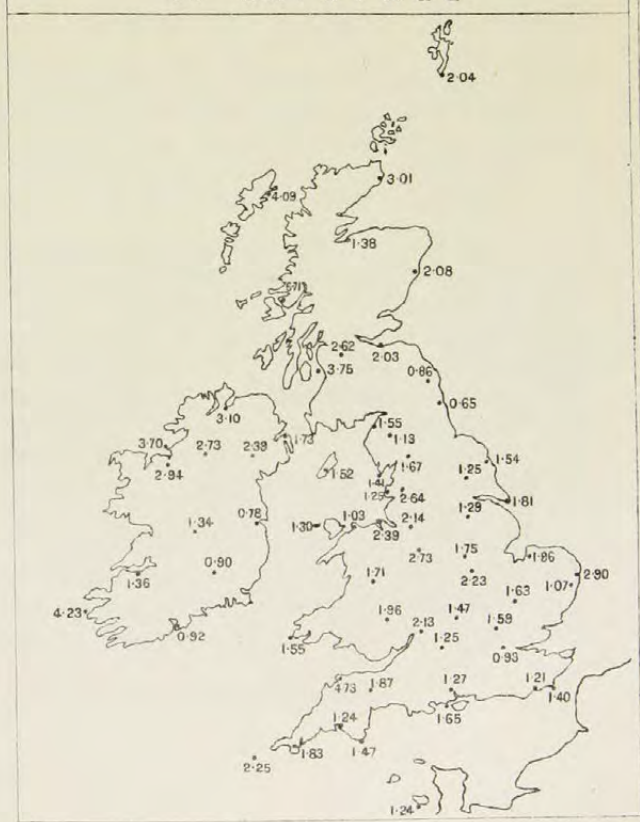
2. MOVEMENTS OF DEPRESSIONS.



3. DISTRIBUTION OF MEAN TEMPERATURE.



4. RAINFALL



MONTHLY WEATHER REPORT.

SEPTEMBER 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather of September was, on the whole, mild, dry, and quiet for the time of year. It was of three distinct types, viz. :—

- (1.) Cyclonic, and complex,—lasting from the 1st to the 8th;
- (2.) Anticyclonic,—lasting almost continuously from the 9th to the 19th.
- (3.) Cyclonic, and south-westerly,—lasting from the 20th to the 30th.

The mean pressure of the month was about 0·2 inch in excess of its average value; the winds were, as a rule, moderate, but South-westerly gales of considerable strength were experienced from time to time on our western and northern coasts, and on one occasion a slight Northerly gale was felt in the south-east. Temperature was, on the whole, about 2° above the average, rainfall was deficient, except over one or two extreme parts of the kingdom, but bright sunshine also was deficient.

September 1-2.—The month of September commenced with pressure somewhat high both over the extreme northern and southern parts of the Continent and low over the Atlantic. Its distribution was, therefore, a little complex, as an ill-formed “hollow” extended eastward, from the Atlantic, over the British Islands and the North Sea. Thus, while South-westerly breezes were felt over France, Holland, and greater part of England, Easterly to South-easterly winds were blowing in Norway and the Skager Rack. Over North Britain variable airs and calms prevailed, while in Ireland the wind was Southerly. The weather was mild, cloudy, and showery, and in some localities the rainfall was heavy. Depression No. XLIX.* now advanced towards the British Islands, and, just skirting our extreme western coasts, made the weather still more unsettled for a time in the north-west, but passed away to the northward on the night of the 2nd. The barometer rose briskly immediately in its rear, and thunderstorms occurred in the north and north-east as the disturbance moved off. A new fall then set in over the Bay of Biscay and very unsettled weather became general.

September 3-8.—During this period the pressure distribution was cyclonic, and very complex, but leaning more to the westerly type over our southern stations and France than to any other. During its prevalence two very well-defined systems passed over our Islands and their neighbourhood. The first (No. L.*) advanced rapidly towards Lorient on the 3rd (see the Charts in the Weekly Weather Reports, 1884, p. 142), and, travelling in a north-easterly direction, reached Belgium and our south-eastern counties by the following morning. At this time strong Northerly winds prevailed over the south and east of England, North-westerly gales in the west of France, strong Southerly winds in the north-east of France, and an Easterly gale in Holland. Rain fell for many hours in a continuous downpour at all our south-eastern stations and over France, the total fall varying from 1·5 in. to upwards of 3 inches over the south-eastern parts of England. On the 5th the centre of the disturbance (which had grown much deeper) was off the south of Norway, and strong Easterly winds and much rain were recorded at Oxö. The centre then moved north-westwards, and Northerly gales were experienced in the north and east of Scotland, 1·7 inch of rain falling at

* See Section II. and Map 2 Plate XIX. for the history of tracks of depressions.

Sumburgh Head. It is worth remarking that, notwithstanding the great alterations which took place in the movements of this system, it continued to grow deeper and deeper, and finally passed away from our area without showing any indication of filling up. On September 6th (as the system just noticed was disappearing from our area) a new depression (No. LI.*) advanced towards Ireland, apparently from the south-westward, and the wind backed to South-west and South over Ireland and England, and increased in force. The new disturbance, instead of moving northwards, travelled directly across our Islands and the North Sea, causing strong South-Westerly to North-Westerly winds and gales, and bringing with it a further fall of rain, which was nearly as heavy at the Irish and Welsh stations as that of the 3rd had been in the south-east of England. As it passed away the barometer rose quickly on our coasts, the weather cleared, and the depression began to fill up quickly.

September 9-20.—During this period anticyclonic conditions prevailed over our Islands with very little interruption. Between the 9th and 15th a well-formed anticyclonic system (No. XVIII., page 91) lay more or less over the United Kingdom, and fine, dry, but hazy weather was reported generally. Temperature was not high for the time of year, the highest of the daily maxima being only 70° to 75° , while the nights were occasionally cold and foggy. (see the Daily and Weekly Weather Reports for about this date). On the 15th and 16th a well-formed depression (No. LII.*) advanced northwards and north-westwards from the Bay of Biscay, and as it passed by our extreme south-western coasts the anticyclonic system receded to the eastern and south-eastern shores of the North Sea. Temperature now rose considerably over England, the maximum readings during the daytime increasing to between 76° and 78° on the 15th, and to between 80° and 84° on the 17th. The latter were the highest observed during the month. As this depression passed away the barometer rose quickly in its rear, and a new anticyclonic system (No. XIX.) was formed over Ireland. The winds again fell light and variable, the air became hazy, but dry, and the thermometer went down, the nights in particular being cold generally. This new system increased quickly in size, and, moving in an easterly direction, spread over the whole of our Islands; the wind thus became Easterly in the south, and Southerly in the west and north, and in the end, the Southerly breeze veered towards South-west, and became the prevailing wind of our area.

September 21-30.—The general distribution of pressure, and the winds reported over our area during this period were, on the whole, of a South-westerly or Westerly type. Pressure was continuously highest over the Bay of Biscay or France, and lowest to the northward of our Islands, the gradients being, generally, moderate to rather steep. The winds were South-westerly and Westerly. Temperature did not differ much from the mean for the time of year, and the air over England was moderately moist. From time to time large well-formed depressions (five in all) passed by our extreme north-western coasts, travelling in about the direction shown by the broken arrow marked "LIII. and LIV." on Map 2 Plate XIX. Their subsidiary disturbances were occasionally very angular in form and travelled directly over the kingdom, bringing with them sharp showers, and occasionally strong winds veering from South-west to North-west. The largest and deepest system (No. LIII.*) passed very near to the Hebrides on the 27th, when the barometer fell to 28.9 inches at Stornoway, and South-westerly gales of considerable strength were felt on all our western and northern coasts. A second, similar, and somewhat important system (No. LIV.*) travelled in about the same track on the 30th, but it covered a less extensive area, and its gales were consequently not felt so generally as those on the 27th. This was moving away to the eastward when the month closed. In all cases the centres of the main disturbances lay at so great a distance from our coasts, that their tracks cannot be indicated with great certainty on Map 2.

* See Section II. and Map 2 Plate XIX. for the history and tracks of depressions.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—SEPTEMBER 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XLIX. September 1-2.	No. L. September 3-5.	No. LI. September 6-8.
Form - - - -	Apparently nearly circular - -	Nearly oval - - - -	Irregular oval.
Size - - - -	Apparently large - - - -	Moderate to large - - - -	Moderate.
Depth - - - -	Doubtful, apparently moderate -	Moderate - - - -	Moderate.
Where first Observed -	To the westward of Ireland - -	Over the west of France, near Nantes	Off the west of Ireland.
Direction of Motion - -	About north-north-east - - -	North-westerly till morning of 4th, then more northerly till morning of 5th, then north-westerly.	East-north-easterly till 8th, then, after an interval, south-easterly.
Rate of Motion - - -	Slow - - - -	Moderate until the French coast was reached, then slow.	Moderate to slow.
Regions passed over by Steepest Gradients.	Ireland, the west of Scotland, and the portion of the Atlantic which lies off the north-western parts of our Islands.	Bay of Biscay, France, the south-east of England, and the North Sea.	Ireland, England, and the Channel.
Termination - - -	Travelled away to the northward -	Passed away in a north-westerly direction towards Iceland.	Filled up to the eastward of the North Sea.
Time under Observation -	2 days - - - -	About 3 days - - - -	3 days.
Accompanying Winds -	South-easterly to Southerly, and South-westerly; light at first, then strong in the west and north.	South-west to North-west gales in south of France, North-east to North-west (strong) over England; Northerly to Westerly, strong, in Ireland.	South-west to North-west, strong breeze to strong gale. Gale of very brief duration in the east.
Weather -	Showery, with thunder and lightning in the west and north.	Very rainy, squally, and unsettled -	Very unsettled, rough, and wet.
Rainfall -	General, except in the north-east of England, but not heavy.	Very heavy over France and the south-east of England. More than 3 inches at Geldeston, and again in the far north.	General, except in extreme north of our Islands; heavy at the western and north-western stations.
REMARKS - - -	<p>This depression advanced while pressure was (relatively) high, both over northern and southern Europe. Its centre remained a long way to the westward of our coasts, but numerous small shallow and local disturbances were developed as it moved north-eastwards, in an arm of low pressure which lay from west to east over the northern and north-western parts of the Kingdom.</p> <p>This depression came towards the west of France at a time when pressure was highest over northern and central Europe, and lowest to the westward of the British Islands. Its rate of progress was much greater before its centre reached the French coast than it was subsequently, and yet the system continued to grow deeper as it advanced. (See maps in the Weekly Weather Report, 1884, p. 142.)</p> <p>As the centre approached the north-west of France, a small (temporary) anticyclone was incidentally formed over the south of Ireland, but broke up before morning.</p> <p>This depression advanced from the westward just as No. L. was disappearing to the north-westward of Scotland. It appears to have undergone very little change in crossing our Islands, but on reaching the North Sea its progress was considerably arrested. On arriving near Jutland the system moved south-eastwards, and filled up.</p>		

SECTION II.—*continued.*

TABLE OF CYCLONIC SYSTEMS.—SEPTEMBER 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. LII. September 15-16.	No. LIII. September 27.	No. LIV. September 30-October 1.
Form - - - -	Uncertain; apparently nearly circular about its centre.	Uncertain; apparently nearly circular	Apparently nearly circular.
Size - - - -	Moderate - - - -	Large - - - -	Large.
Depth - - - -	Moderate - - - -	Deep - - - -	Doubtful; apparently deep.
Where first Observed - -	Over the Bay of Biscay - -	Off the north-west of Scotland -	To the north-westward of Ireland.
Direction of Motion - -	Northerly and north-westerly - -	About east-north-easterly - -	About north-easterly.
Rate of Motion - - -	Slow - - - -	Apparently rapid - - -	Moderate.
Regions passed over by Steepest Gradients.	South-west of England and south of Ireland.	Scotland and north of Ireland -	Scotland and north of Ireland.
Termination - - -	Travelled away to the north-westward over the Atlantic.	Travelled away to north-eastward outside the Norwegian coast.	Travelled away to the north-eastward.
Time under Observation -	2 days - - - -	1 day - - - -	2 days.
Accompanying Winds -	Easterly and South-easterly in our Islands; strong in the west.	South-westerly gales, veering to west, and lulling.	Southerly, veering to south-west, and lulling. Gales in north and west, but not on our south and east coasts.
Weather -	Showery, with local thunderstorms -	Squally and showery, but mild -	Squally and showery, but mild.
Rainfall -	General over Ireland and England; heavy in the south of Ireland, moderate to slight elsewhere.	Slight, except in the Shetlands; none on our north-east coast.	Slight and partial; none fell at our southern and south-eastern stations.
REMARKS - - -	This depression came on while anti-cyclone No. XVIII. was lying over our Islands. Its progress was clearly marked, and some very shallow subsidiary disturbances on its eastern side caused the wet thundery weather to extend well to the eastward, over England.	This disturbance advanced very suddenly when pressure was highest over southern Europe and lowest to the north-westward of our Islands. It had no subsidiary disturbance worth mentioning, and its rainfall was very trifling.	This disturbance appeared when pressure was highest over France, Germany, Russia, and the Baltic, and lowest off our north-west coasts. Its track lay even further from us than that of No. LIII, and its bad weather was felt only at the western and northern stations.

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS, SEPTEMBER 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XVIII. September 9-17.	No. XIX. September 17-20.
Form - - - - -	Varying greatly; generally elongated - -	Variable; generally elongated.
Size - - - - -	Large - - - - -	Small to large.
Height - - - - -	Small. Highest readings recorded were 30° 5+, on 11th and 12th.	Small to moderate. Highest readings recorded were 30° 4+, on 18th.
Where first Observed - - - -	Over the Bay of Biscay - - - - -	Over Ireland.
Direction of Motion - - - - -	North-easterly at first, then stationary -	Easterly and east-south-easterly.
Rate of Motion - - - - -	Moderate at first, then very slow and variable	Very slow.
Regions passed over - - - - -	France, south of England, and the North Sea	British Isles and North Sea.
Termination - - - - -	Moved out of our area to Germany, and dispersed.	Moved south-eastwards out of our area.
Accompanying Wind - - - - -	Varying; Easterly and South-easterly at our southern stations, Southerly and Westerly in the north.	Easterly and south-easterly in the south and South-west; Westerly and South-westerly in the north and north-west.
Weather - - - - -	Improving greatly as the system advanced. Very fine over our Islands, until depression No. LII. approached our south-western coasts.	Fine and warm, but not so warm as on 17th.
REMARKS - - - - -	During the prevalence of this system temperature rose steadily, but owing to the prevalence of haze and fog (especially in the north) the maximum temperatures recorded did not reach 80° in any part of the kingdom until the 17th, when, as the system was breaking up the thermometer rose to between 80° and 84° over England.	This system was formed over Ireland in the rear of depression No. LII. (see p. 90). It grew rapidly in size, soon spreading all over the kingdom, and finally occupied much the same position over Germany as that previously held by anticyclone No. XVIII.

SECTION III.

REMARKS FOR SEPTEMBER 1884.

(Tables *XVII.* and *XVIII.*, with Plates *XVIII.* and *XIX.*)

Pressure.—The mean pressure of the atmosphere at 8 a.m. (as shown by Map 1 Plate XIX.) varied from about 30·03 inches over our south-eastern counties to about 29·80 inches at Stornoway and Sumburgh Head, the gradients being very uniform, except over the mouth of St. George's Channel, where they were decidedly slighter than elsewhere. These conditions show that the average direction of the wind during the month was South-westerly, and this is fully borne out by the wind-roses shown on Plate XVIII. The isobars show that the relative distribution of pressure during this month was almost identical with the average distribution for the same period during the 20 years 1861–80, but that, over the whole of the kingdom, the actual values were about two-tenths of an inch higher than the average. The highest readings observed occurred on the 12th or 13th, at which time the anticyclone No. XVIII. was lying over our area, and on which occasion the mercury rose to 30·5+ inches in the east of Scotland. The lowest readings were recorded on the 4th at our southern and eastern stations, while depression No. L. was advancing over France, and on the 27th in the north, when the large depression No. LIII. was passing by our extreme north-western coasts, and on which occasion the mercury fell to 28·9 inches at Stornoway. At the central stations the lowest readings occurred on the 6th or 7th as depression No. LI. was passing over the kingdom. The range was considerable (about 1·5 inch) in Scotland, but amounted to only about an inch on our southern coasts.

Movements of Depressions.—These were, as a rule, in a more or less easterly direction; at first they were variable, *e.g.*, while No. L. was travelling in a north-westerly direction out to sea from the Norwegian coasts, No. LI. was advancing eastwards from the Atlantic towards Ireland. The movements of the disturbances which passed outside our extreme northern coasts between the 20th and 30th were, however, very regular so far as direction is concerned, but differed somewhat in rate. The track of depression No. LII. over the Bay of Biscay, though apparently singular, is not uncommon when an anticyclone lies over Scandinavia and pressure is low over the Atlantic; when this occurs during the summer season, subsidiary disturbances appear over France, and moving northwards bring thunderstorms to England, with a shift of wind from East or South-east to South-west and West.

Anticyclones.—The large systems were two in number, and both moved in a more or less easterly direction. They brought with them fine weather, but haze in many places, and on reaching the eastern shores of the North Sea, the light Southerly winds on their western sides produced very warm weather over the United Kingdom. The temporary development of a small anticyclonic system over the south of Ireland on the evening of the 3rd is worthy of note, inasmuch as it exhibited, while it lasted, the usual characteristics of a more permanent system.

Winds.—These were chiefly South-westerly and Westerly, as will be seen on referring to the wind-roses on Plate XVIII., but at the more southern stations there was also a large percentage of winds from the Eastward, appearing principally when the anticyclones lay over, or to the north-eastward of, our Islands. The Easterly breezes were light or moderate in strength, but those from South-west and West were frequently strong and formed a considerable number of gales at our western and north-western stations. The observer at Loughborough apparently over-estimates the force of the winds, and hence the number of gales reported at that station is in excess of that at any other inland station over England.

Temperature.—The mean (sea-level) temperature over Great Britain varied from a little above 61° over our south-eastern counties to between 53° and 54° in the extreme north of Scotland, while that over Ireland varied from about 58° at Roche's Point to between 55° and 56° over Connaught. These values, when compared with the averages for the corresponding

month in the 20 years 1866-80, show an excess for the present year amounting to about 2° over Great Britain and the east and north of Ireland, while over the west and north-west of Ireland there appears to be no excess at all. The early disappearance of the usual summer type of temperature-distribution during this month is remarkable, especially when it is remembered that the mean values for the month are almost everywhere higher than the averages for the time of year. The inference seems to be that the temperature of the water round our Islands was higher than is usual at this time of year, and this is to a great extent supported by the results of a cursory investigation into the temperature of the Gulf Stream, to which attention was drawn on page 4 of the Daily Weather Report for September 26. There is another fact pointing in the same direction, viz., that while the temperature for this month has been lower than that for August by as much as five or six degrees over the inland parts of England, and by three or four degrees over the inland parts of Ireland, the decrease at the south-western and southern coast stations has been very much smaller, or about two and a half degrees on the south coast of England, two degrees at Pembroke, two and a half at Roche's Point, and only one degree at Valencia. On our north-eastern coasts, on the contrary, the decrease is as much as four degrees. The highest readings observed were recorded on the 17th over the greater part of England, the 18th at the south-western stations and in the south of Ireland, and the 19th at Holyhead and in the central parts of Ireland. At the Scotch stations the highest readings occurred on very various dates, but on the whole, the maxima of the 11th and 12th appear to have been the highest. The lowest temperatures occurred on the 3rd or 4th at most of the northern and north-western stations, but on the 30th over the greater part of England. The range was somewhat large over the inland counties of England, amounting to 49° at Leicester and Loughborough, to 45° at Cambridge, and to more than 40° in many other places. Over the inland parts of Ireland the range varied from 39° to 42° .

Vapour Tension varied from 0.33 in. at Nairn, 0.35 in. at Parsonstown, and 0.36 in. over the north-west of England, to 0.40 in. over the west of Scotland and south of Ireland, and to 0.44 in. on the south coast of England. In the Channel Islands the value was 0.45 in. *Relative Humidity*, however, was lowest (81 to 85) over the inland parts of Scotland, highest (95) off the north-east coast of England; the values are not very regularly distributed over the kingdom.

Rainfall.—This was short of the average except in the north of Ireland, the south of the Shetlands, and over the extreme east and south-east parts of England, where there was an excess. The excess over the north of Ireland was caused mainly by the heavy rains which accompanied depression No. LI., when it first impinged on our western coasts, while that at our south-eastern stations and at Sumburgh Head was the result of the heavy down-pour which accompanied depression No. L., as has been already stated on page 87, but it is somewhat remarkable that with the complex and unsettled conditions which prevailed between the 1st and 9th, and so much South-westerly wind as we had between the 20th and 30th, the rainfall should have been short of the average anywhere, especially at the western and northern stations.

Bright Sunshine.—Assuming that the total duration of sunshine possible at each station is represented by 100, the amounts actually recorded varied from 48 at Jersey, 44 at Pembroke, and between 41 and 45 over our eastern counties to between 30 and 35 over most of the more northern and north-western parts of the kingdom. At Markree Castle (Sligo) the value was only 26, and at Leicester 25. The amount of sunshine recorded over central England was materially lowered by the fog and haze which prevailed during the otherwise fine (anticyclonic) weather which prevailed about the middle of the month, while that in the north-west was reduced by the clouds accompanying the many depressions which passed near those regions between the 20th and 30th.

TABLE XVII.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC Observations are made at 8 a.m. daily, but the Number of Days of Rain, Snow, Hail, (The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			Means of				Absolute Extremes.			
			At 8 a.m.	Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head - - -	ins. 29°793	52°3	47°6	56°1	51°9	46	9th	60	4th
	Wick - - -	29°838	53°7	46°8	60°2	53°5	37	4th	74	11th
	Stornoway - - -	29°802	52°5	47°2	58°8	53°0	39	1st	66	12th
1. SCOTLAND, E.	Nairn - - -	29°852	53°5	47°8	62°7	55°3	38	4th	76	11th
	Aberdeen - - -	29°889	53°7	47°3	61°6	54°4	37	4th	70	20th
	Leith - - -	29°909	54°2	49°0	61°8	55°4	40	4th	68	18th
2. ENGLAND, N.E.	Shields - - -	29°937	54°0	49°6	62°2	55°9	43	4th	72	20th
	York - - -	29°979	54°5	49°9	66°3	58°1	39	30th	78	17th
	Spurn Head - - -	29°968	56°6	53°2	62°3	57°8	47	28th, 30th	69	17th
3. ENGLAND, E.	Yarmouth - - -	29°992	57°9	54°0	63°4	58°7	45	30th	71	21st
	Cambridge - - -	30°007	57°0	49°8	68°1	59°0	36	30th	81	17th
4. MIDLAND COUNTIES	Loughborough - - -	30°002	54°9	50°4	67°6	59°0	35	30th	84	17th
	Oxford - - -	30°017	56°2	52°0	67°0	59°5	35	30th	81	17th
5. ENGLAND, S.	London - - -	30°031	58°4	53°1	68°5	60°8	42	30th	83	17th
	Dungeness - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	Records
	Hurst Castle - - -	30°023	59°0	54°9	66°5	60°7	46	30th	76	16th, 18th
6. SCOTLAND, W.	Ardrossan - - -	29°908	55°2	51°0	61°3	56°2	41	1st	70	12th
7. ENGLAND, N.W.	Hawes Junction* - - -	28°737	52°4	46°1	60°3	53°2	38	4th	73	17th
	Barrow-in-Furness - - -	29°942	56°7	53°1	63°7	58°4	47	4th	74	12th, 13th
	Liverpool - - -	29°964	57°0	52°8	64°4	58°6	44	30th	73	17th
	Holyhead - - -	29°964	57°3	54°0	62°6	58°3	48	6th	72	19th
8. ENGLAND, S.W.	Pembroke - - -	29°977	58°1	55°5	62°3	58°9	50	3rd	73	18th
	Prawle Point - - -	30°027	58°0	54°1	64°1	59°1	43	30th	75	18th
9. IRELAND, N.	Donaghadee - - -	29°933	54°8	48°7	61°7	55°2	40	1st	70	9th
	Mullaghmore - - -	29°892	55°0	51°9	61°3	56°6	46	29th, 30th	74	19th
10. IRELAND, S.	Parsonstown - - -	29°950	53°0	48°4	63°9	56°2	37	5th	76	19th
	Valencia - - -	29°954	57°8	52°7	63°0	57°9	47	3rd	73	18th
	Roche's Point - - -	29°970	57°4	52°6	63°6	58°1	46	3rd, 29th	71	18th
CHANNEL ISLANDS	Scilly (St. Mary's) - - -	29°994	59°9	55°1	64°1	59°6	50	16th	71	18th
	Jersey (Noirmont) - - -	30°037	60°9	56°7	66°8	61°8	52	24th	77	17th

* Hawes Junction is 1,135 feet above Mean Sea Level, and the

- TABLE XVII.

REPORTING STATIONS in the BRITISH ISLANDS during the Month of September 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred.

beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calms.
ins. 0.352	% 90	7.6	ins. 4.70	ins. 1.72	5th	23	0	0	0	3	13	3	1	3	1	3	5	6	6	2	3
*361	87	5.8	1.11	0.35	27th	15	0	1	3	8	10	3	4	0	2	1	6	5	4	3	5
*359	91	6.9	3.99	0.73	30th	21	0	0	1	6	14	6	2	1	2	2	9	6	3	3	2
*334	81	4.9	0.53	0.13	28th	11	0	0	1	12	11	1	1	0	1	0	1	8	4	2	13
*351	85	5.4	1.50	0.38	6th	15	0	0	2	11	10	4	2	0	2	0	10	6	2	3	5
*355	84	6.2	1.65	0.80	6th	18	0	0	0	7	12	0	1	3	4	1	2	6	7	3	3
*380	91	6.9	1.17	0.37	6th	13	0	0	2	6	13	1	2	2	1	1	7	9	3	3	1
*381	90	6.2	1.02	0.32	21st	11	0	0	0	7	8	0	6	1	2	2	6	5	5	2	1
*431	94	4.7	0.68	0.17	4th	7	0	0	2	12	7	1	2	3	4	2	7	5	5	1	1
*431	90	3.2	4.73	2.57	4th	13	0	0	0	18	4	2	2	4	4	3	1	7	4	3	2
*420	90	6.5	1.67	0.55	4th	10	0	0	1	8	15	0	4	4	2	1	8	5	3	3	0
*387	90	7.4	1.19	0.35	15th	12	0	0	1	5	15	26	0	3	4	4	4	3	9	2	1
*394	87	6.5	1.29	0.38	3rd	10	0	0	0	10	17	1	2	5	3	1	7	4	5	2	1
*407	83	6.2	1.72	0.72	3rd	13	0	0	1	9	11	0	0	2	7	2	5	5	4	4	1
incomplete.																					
*445	90	6.5	1.92	0.71	3rd	17	0	0	0	2	5	5	1	8	3	0	1	7	6	4	0
*398	90	6.7	3.28	0.85	28th	15	0	0	0	7	15	6	3	4	5	0	4	7	3	0	4
*360	91	5.6	4.47	1.12	21st	18	0	0	0	9	7	0	3	0	3	4	4	6	6	4	0
*392	85	5.1	3.27	0.69	21st	16	0	0	1	8	8	5	3	10	0	4	2	5	2	4	0
*383	82	6.3	2.85	0.57	6th	17	0	0	1	5	8	1	0	1	4	7	5	5	6	2	0
*413	87	6.6	2.00	0.49	6th	12	0	0	0	5	9	5	1	2	2	1	9	8	4	2	1
*409	84	7.0	3.53	0.90	6th	20	0	1	1	1	9	4	0	2	6	5	3	7	4	5	0
*436	90	6.2	1.58	0.26	3rd	16	0	0	2	7	10	0	4	6	1	1	2	7	4	5	0
*392	91	5.8	3.59	1.73	6th	19	0	0	0	9	10	2	1	2	3	1	3	6	11	3	0
*372	86	7.6	4.25	1.14	6th	18	0	1	0	1	8	10	1	0	4	5	4	9	3	4	0
*352	87	6.9	1.88	0.53	6th	18	0	0	0	7	18	0	1	0	2	7	7	3	4	0	6
*410	85	7.2	3.77	0.48	25th	23	0	0	0	3	15	6	2	1	1	5	5	5	7	3	3
*409	87	6.5	2.89	1.06	15th	19	0	0	0	3	8	3	2	1	4	4	2	4	10	3	0
*439	86	7.2	1.63	0.39	21st	18	0	0	2	4	13	4	1	3	5	3	2	7	4	4	1
*445	83	5.8	3.69	1.13	3rd	16	0	0	3	8	12	1	2	6	4	1	2	6	5	4	0

barometric observations at this Station are not reduced to sea level.

TABLE XVIII.

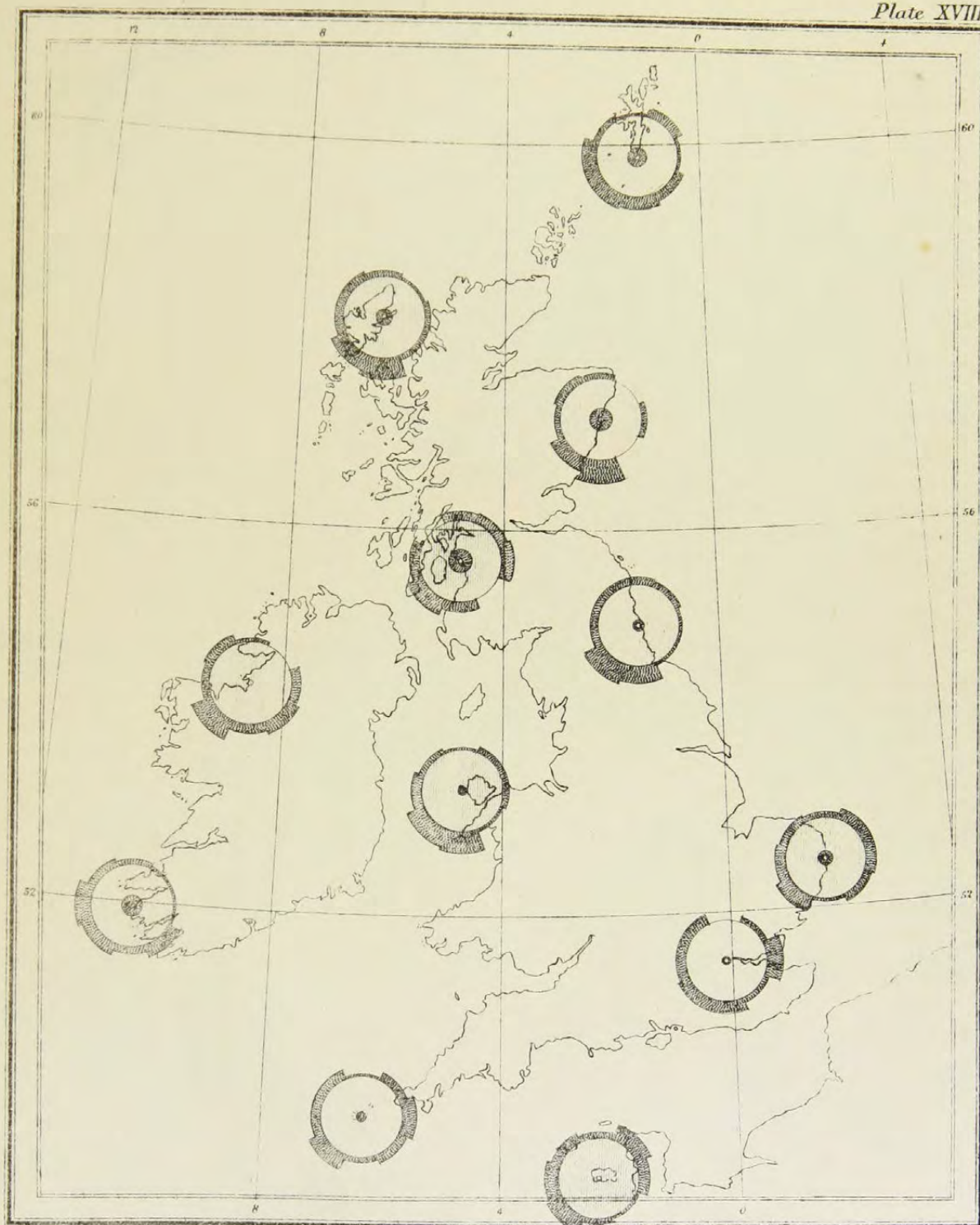
OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of September 1884.

STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per-centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Mini-mum.	Date.	Maxi-mum.	Date.			
STORNOWAY - -	*	*	*	*	*	*	*	*	134	35
ABERDEEN - -	*	*	*	*	*	*	*	*	138	37
ALNWICK CASTLE - -	47'7	60'7	54'2	38	3rd	68	20th	2'48	—	—
SCARBOROUGH - -	51'3	62'8	57'1	44	30th	69	17th, 20th	1'30	—	—
YORK - -	*	*	*	*	*	*	*	*	115	31
HILLINGTON - -	49'9	67'4	58'7	34	30th	80	17th	2'41	136	36
GILDESTON - -	51'6	66'3	59'0	40	30th	79	17th	3'90	168	45
CAMBRIDGE - -	*	*	*	*	*	*	*	*	154	41
ROTHAMSTED - -	50'0	66'6	58'3	36	30th	80	17th	2'19	—	—
BAWTRY - -	49'3	67'5	58'4	37	29th	82	17th	0'81	—	—
LEICESTER - -	50'0	67'9	59'0	35	30th	84	17th	1'30	104	28
CHEADLE - -	49'2	63'3	56'3	39	30th	78	17th	2'41	—	—
CHURCHSTOCK - -	49'0	64'9	57'0	36	30th	74	17th	1'38	142	38
HEREFORD - -	49'7	67'4	58'6	33	30th	77	17th	1'08	—	—
CIRENCESTER - -	49'5	64'6	57'1	34	30th	78	17th	1'45	116	31
OXFORD - -	*	*	*	*	*	*	*	*	135	36
LONDON - -	*	*	*	*	*	*	*	*	116	31
MARLBOROUGH - -	50'1	66'2	58'2	33	30th	79	17th	1'81	128	34
HASTINGS - -	55'5	66'7	61'1	47	5th, 27th	81	18th	3'41	139	57
SOUTHAMPTON - -	51'6	67'9	59'8	44	30th	80	18th	2'02	141	38
LAUDALE - -	49'9	61'4	55'7	41	1st	71	12th, 13th	7'05	—	—
GLASGOW - -	49'1	60'6	54'9	41	1st	69	17th	5'49	111	30
SILLOTH - -	49'9	64'8	57'4	41	4th, 5th	73	17th	2'76	143	38
DOUGLAS - -	49'8	63'3	56'6	38	6th	72	17th	5'36	153	41
NEWTON REIGNY - -	46'2	63'7	55'0	33	4th	74	19th	3'20	135	36
STONYHURST - -	49'7	63'5	56'6	39	4th	71	16th, 17th	3'56	141	38
BLACKPOOL - -	51'0	64'0	57'5	38	4th	72	13th, 16th, 17th,	2'73	132	35
MANCHESTER - -	50'4	64'5	57'5	41	30th	73	16th	3'65	—	—
LLANDUDNO - -	52'8	63'8	58'3	46	4th, 26th	72	19th	1'57	116	31
PEMBROKE - -	*	*	*	*	*	*	*	*	164	44
ARLINGTON - -	51'6	64'1	57'9	39	30th	77	17th	3'29	—	—
CULLOMPTON - -	52'0	66'6	58'8	33	30th	77	17th, 18th	1'65	137	37
FALMOUTH - -	54'7	63'4	59'1	49	30th	71	17th	3'08	139	37
PLYMOUTH - -	53'2	65'8	59'5	40	30th	74	18th	2'52	153	41
JERSEY - -	*	*	*	*	*	*	*	*	179	48
LONDONDERRY - -	49'0	63'8	56'4	41	6th	75	19th	3'61	—	—
MARRREE CASTLE - -	48'1	62'2	55'2	34	6th	74	19th	3'71	99	26
BROCKBOROUGH - -	47'2	62'3	54'8	33	6th	75	19th	3'10	—	—
ARMAGH - -	49'0	62'2	55'6	44	1st, 4th, 7th, 29th, 5th	72	28th	2'89	115	31
DUBLIN - -	52'1	63'8	58'0	45		74	9th	1'21	148	39
PARSONSTOWN - -	*	*	*	*	*	*	*	*	136	36
VALENCIA - -	*	*	*	*	*	*	*	*	120	32
FOYNES - -	50'2	64'7	57'5	44	27th	74	19th	2'55	—	—

* Information to be found in Table XVII.

MONTHLY WIND CHART FOR SEPTEMBER 1884.

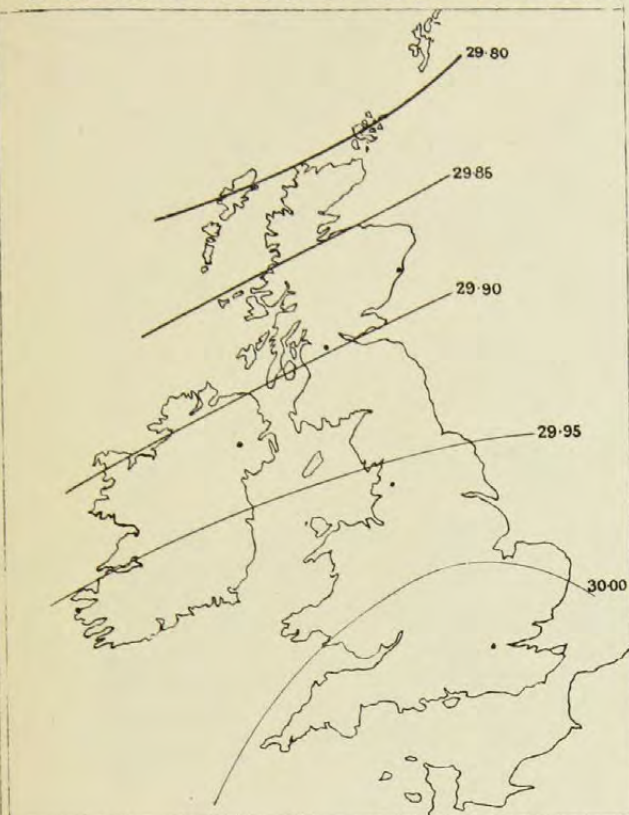
Plate XVIII.



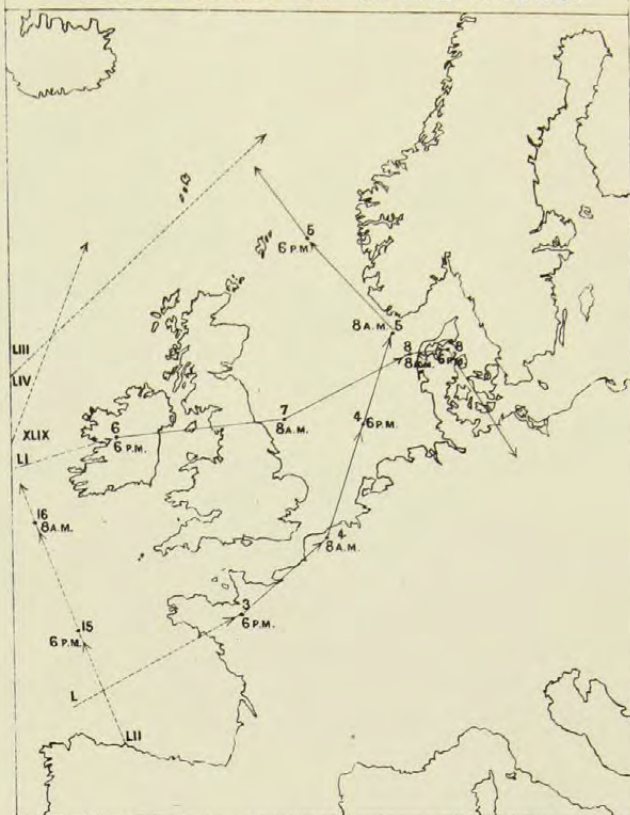
To face p. 94.

DANCERFIELD LITH 22 BEDFORD ST COVENT GARDEN.
8815

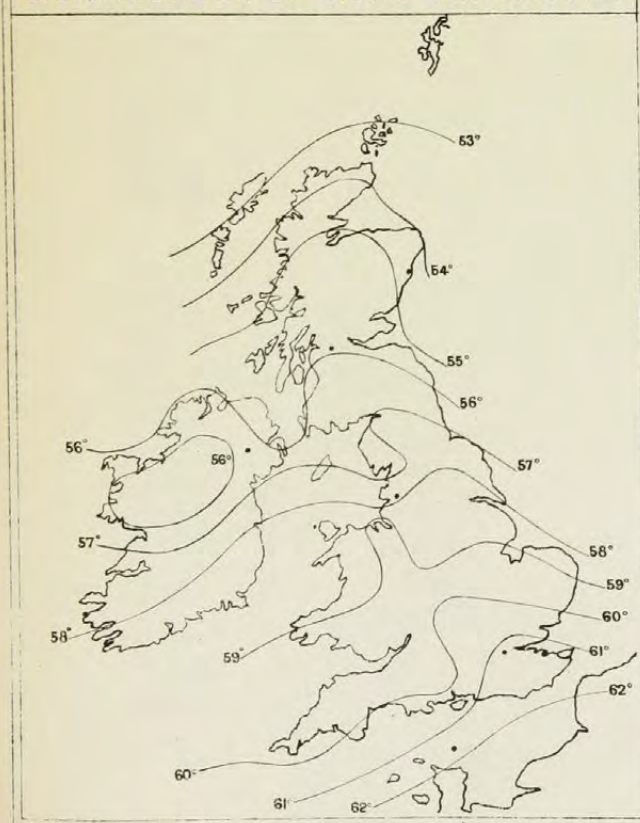
1. DISTRIBUTION OF MEAN PRESSURE.



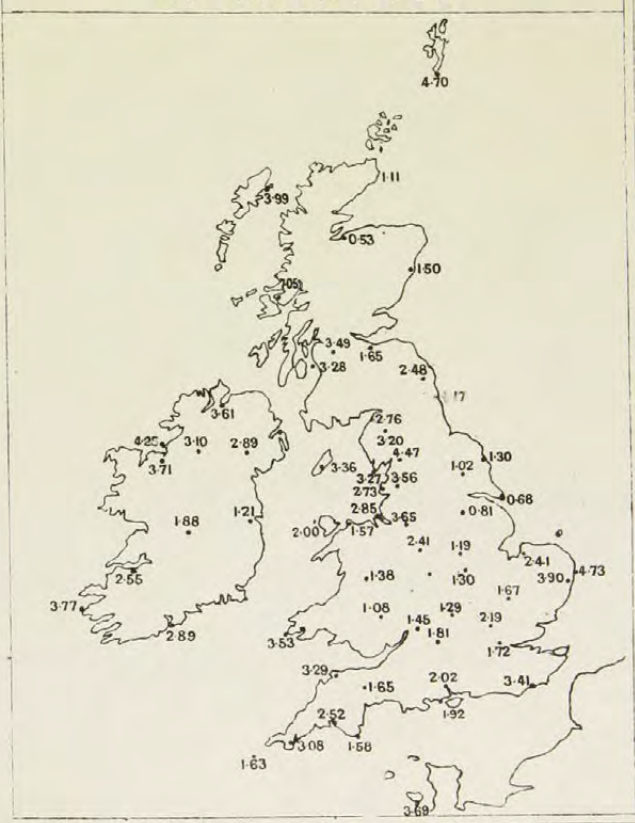
2. MOVEMENTS OF DEPRESSIONS.



3. DISTRIBUTION OF MEAN TEMPERATURE.



4. RAINFALL.



MONTHLY WEATHER REPORT.

OCTOBER 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather during October was fair on the whole. In most places it was dry, but over the extreme north-western parts of the kingdom showers were frequent and the rainfall in excess of the average. On our extreme south-eastern coasts, a heavy local fall on the 10th brought up the amounts measured to more than their average values, but in other respects those regions were dry. Pressure was in excess of the mean; the winds were more Westerly than usual, and at times blew hard, as some large depressions passed over our area. Temperature differed very little from the average, being slightly low, except in Scotland, and its range was small for the time of year. Bright sunshine was deficient except perhaps at the Channel stations.

October 1-3.—The conditions prevalent during this interval were of a complex character—chiefly of the south-westerly and southerly types—pressure being, on the whole, highest at the Continental stations, and lowest to the northward and north-westward of the British Islands. It was during this period that depression No. LV.* advanced in a north-easterly direction outside our extreme western and north-western coasts, and, as it did so, developed a well marked “hollow” over the North Sea. Under these circumstances, the wind at our own stations, after backing to the Southward as the depression approached us, veered to West and North-west as it travelled away to the north-eastward. Temperature fell greatly as the wind shifted to West and North-west, and on the 2nd showers of rain fell pretty generally. The North-westerly wind subsequently spread to the eastern shores of the North Sea.

October 4-7.—The barometer now rose generally, and anticyclonic conditions became established over the United Kingdom. The system (No. XX., p. 102) advanced from the south-westward immediately in the rear of depression No. LV., bringing with it the fine, dry, cool, but somewhat hazy weather usual with anticyclones at this time of year. The wind after veering to North-west, lulled very generally, and as the centre passed north-eastward over our Islands, drew into north-east at the southern stations, while it was very light and variable from the westward, or calm, in the north. By the 6th the system had undergone great modification in form, its central area then assuming the form of a long band (or crest) of high pressure stretching in a west-south-west to east-north-east direction across the northern parts of the British Islands, the German Ocean, the south of Norway and Sweden, and the Baltic to Russia, while there were some indications of a small and very shallow depression over Belgium, the northerly gradients of which produced a temporary freshening of the wind at our most eastern stations during the following night, accompanied by showers, while fair weather prevailed elsewhere.

October 8-12.—The distribution of pressure and wind now became very complex. The crest referred to above gave way suddenly during the night of the 7th, and by the morning of

* See Section II. and Map 2 Plate XXI. for the history and tracks of depressions.

the 8th a large arm of low pressure was formed extending from north-north-west to south-south-east over the British Islands, North Sea, France, and Germany, separating a large high-pressure area over the Atlantic from another over the Baltic and Russia. Into this hollow depression No. LVI.* advanced from the north-north-westward, bringing about a period of strong cold North-westerly and Northerly winds and gales over Ireland, accompanied by cold rain, while South-westerly and South-easterly winds were felt over Great Britain, with milder weather. At 6 p.m. on the 8th its centre lay very near to Malin Head, and by 8 a.m. on the 9th it had reached the mouth of the Bristol Channel (see the Daily and Weekly Weather Reports for this date). The depression now moved eastwards, and as it did so the Northerly gales spread over Great Britain, bringing with them sharp squalls of cold rain and sleet or snow to almost all parts of the country, the fall being exceptionally heavy on our extreme south-eastern coasts. At 8 a.m. on the 10th the centre of the disturbance lay between the coasts of Norfolk and Holland, and a new shallow depression had appeared over the west of Norway. The latter moved slowly and irregularly to the southward, while the one near Holland travelled slowly to the north-north-eastward, the two subsequently coalescing a little to the westward of the Danish coast, and then travelling away to the Baltic. North-westerly gales or strong winds and cold showers continued to prevail over our Islands, while Southerly breezes were felt on the eastern shores of the North Sea, but the former moderated slowly as the centre of the disturbance passed away to the north-eastward and the sky cleared over our Islands, while the latter lulled and veered to North-west.

October 13-19.—The distribution of pressure now became more simple, and of a north-westerly type, pressure being continuously high over the Bay of Biscay and low to the northward and north-eastward of our Islands. Temperature was rather low throughout, but on some occasions the days were warm, and the air dry; slight showers fell from time to time, more particularly over the western and northern parts of the kingdom, but over England the amount of bright sunshine was considerable. Two depressions appeared within our area during this time, viz., Nos. LVII.* and LVIII.* The first of these approached Norway from the westward on the 15th, and, moving south-eastwards, passed away to the Baltic next day. The second reached the Norwegian coast on the morning of the 17th, and its south-easterly motion being unusually rapid, it had passed out of our area by the evening and disappeared over Russia. In each case the centre was at so great a distance from our Islands that its effects were confined to a temporary freshening of the wind at our more northern and north-western stations, accompanied by some showers of rain. A third depression reached the neighbourhood of the north-west coast on the 19th, but instead of moving south-eastwards, travelled away to the north-westward without being at any time sufficiently near to our Islands for its track to be at all accurately made out or for its characteristics to be tabulated with the other cyclonic systems on pages 100 and 101. (See the maps in the Weekly Weather Report, p. 167.)

October 20-23.—The high-pressure area, which had been lying to the southward of our Islands for so many days, now moved eastwards, and travelled over France and our southern counties to Germany (see Anticyclonic System, No. XXI., p. 102), and as it did so the wind fell light over the United Kingdom and backed round to South-west and South, while that in France drew into East and South-east. The weather was very fine, but cool, and fog or haze prevailed in several places. On the 22nd the conditions were anticyclonic and of a southerly type, but on the 23rd a cyclonic tendency was observed in the west, where the barometer fell fast, and the Southerly wind rose to the force of a gale, while it remained light in the East.

October 24-25.—A sudden but very temporary change now took place. The barometer remained high in the east, but an abrupt recovery of pressure in the far west caused the Southerly gale there to lull very quickly, and brought about the formation of a second (but apparently small) high-pressure area off our western coasts. The appearance presented by the chart for 8 a.m. on the 24th was consequently somewhat complex. (See Weekly Weather

* See Section II. and Map 2 Plate XXI. for the history and tracks of depressions.

Report, p. 170, and the Daily Weather Reports for 23rd and 24th.) A large high-pressure area lay to the eastward of the North Sea, and a small one off the west of Ireland, the two being united by a short col which lay over our Islands. Both to the southward and the northward of this col there was a shallow low-pressure area. Thus, while the winds in Ireland were Northerly, those over France and England were South-easterly, and those in Scotland Southerly and South-westerly. Temperature was rather low but uniform, and, except at the most northern and north-western of our stations, the weather was dry. These conditions did not last long, for on the 25th pressure began to give way, most in the north, and the small western system moved first to the south-eastward and then to the southward and disappeared from our area.

October 26–31.—A decided alteration now took place. The barometer continued to fall fast in the north, the change spread southwards with rapidity, and conditions of a south-westerly type were established over our Islands and their neighbourhood. During the first portion of the period the type was cyclonic and complicated, and two depressions (Nos. LIX.* and LX.*) advanced towards the northern part of our area from the westward. The first was very large and deep, and its gradients were very steep; at 8 a.m. on the 26th its centre lay between the Shetland Islands and Christiansund, and although the value for its lowest pressure cannot be quoted, the barometer at Sumburgh Head then stood at 28·3 inches, and there can be little doubt that it had been still lower during the night. Gales from between South-west and North-west were felt very generally, but although the weather was showery in all parts of the kingdom, the amount of rainfall was not large except at some northern stations. As this disturbance moved off the second one (No. LX.*) advanced, and although it was neither so large nor so deep as its predecessor, its track lay a good deal further south and its motion was very rapid. A renewal of Westerly to North-westerly gales was therefore brought about all over the kingdom, accompanied by squally showery weather, but they were of brief duration. In the rear of this system the barometer rose rapidly, and the month closed with South-westerly winds of considerable strength, the gradients being steep and the system large, but very free from complication. Temperature rose and the weather became dry at all but our most western and northern stations.

* See Section II. and Map 2 Plate XXI. for the history and tracks of depressions.

SECTION II. -

TABLE OF CYCLONIC SYSTEMS.—OCTOBER, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. LV. October 2-3.	No. LVI. October 8-12.	No. LVII. October 15-16.
Form - - - -	Apparently circular - - -	Nearly circular at first - - -	Apparently somewhat oval - - -
Size - - - -	Apparently large - - -	Small to moderate - - -	Moderate - - - -
Depth - - - -	Apparently moderate - - -	Shallow to moderate - - -	Shallow - - - -
Where first Observed - -	To the north-westward of Ireland -	To westward of the Hebrides -	Off the west of Norway - - -
Direction of Motion - -	North-easterly - - -	South-south-east till 8 a.m. on the 9th, then easterly till 8 a.m. 10th, then North-north-east and north-east.	South-east - - - -
Rate of Motion - - -	Moderate - - - -	Variable; but generally slow - -	Rapid - - - -
Regions passed over by Steepest Gradients.	Ireland and Scotland - - -	First Ireland, then Great Britain and the north of France. Gradients were steepest on its western and south-western sides.	Southern parts of Sweden and Norway
Termination - - -	Travelled away to the northward -	Passed away to north of Russia -	Travelled away to the Baltic - -
Time under observation -	One day - - - -	About five days - - - -	About one day - - - -
Accompanying Winds - -	Southerly and South-westerly; gales in west and north, followed by strong North-westerly in most places.	Slight South-westerly and Southerly over Great Britain at first, then strong North-westerly in Ireland.	Westerly and North-westerly gales in the Shetlands and south of Scandinavia; North-easterly in north of Norway.
Weather - - -	Squally and showery; mild at first, then much colder.	Cold, squally, and very wet. Much wet snow in north; temperature changing greatly.	Rainy in west of Norway; fair in our Islands, except at our most western stations.
Rainfall - - -	Very general, except in the south-east; rather heavy at the extreme northern and north-western stations.	General and rather heavy; especially heavy at some of our south-eastern stations on the 10th.	Heavy at Christiansund, slight in our Islands.
REMARKS - - -	This disturbance arrived when pressure was high both over France and northern Europe, while a shallow local depression lay over Denmark. The latter dispersed quickly, but as the main depression moved north-eastwards, the barometer rose fast in the south-west; at 8 a.m. on the 3rd two high-pressure areas were found, one over northern Europe and the other over the Bay of Biscay, a "hollow" separating the two.	This disturbance advanced as the high-pressure band (or crest) of the 7th broke up. It appears to have travelled down the eastern side of a large high-pressure area lying over the Atlantic, and, on reaching the south of England, to have moved first eastwards and then northwards along the western side of another large high-pressure area which lay over the Continent.	The first indication of this depression was found in the subsidiary disturbance which appeared near the Shetlands on the morning of the 15th. It approached us when pressure was highest over the Bay of Biscay and lowest to the northward of our Islands, and caused some increase in the wind force at our northern stations.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—OCTOBER, 1884.

No. LVIII. October 17.	No. LIX. October 26-27.	No. LX. October 28.
Uncertain; apparently nearly circular - -	Nearly circular - - - - -	Irregular oval.
Small - - - - -	Very large - - - - -	Large.
Apparently shallow - - - - -	Very deep - - - - -	Deep.
Off the west of Norway - - - - -	To the northward of the Shetland Islands -	Advancing towards Scotland from the westward.
South-east - - - - -	Easterly and north-easterly - - - - -	Easterly and north-easterly.
Very rapid - - - - -	Moderate to very slow - - - - -	Rapid.
South of Norway and Sweden, with Denmark -	Scotland, Scandinavia, and the northern parts of the North Sea. Gradients steep (0.06 in. per 15 miles) within 300 miles of centre.	British Islands, North of France, and the North Sea.
Travelled away to the Baltic - - - - -	Travelled away towards Lapland - - - - -	Travelled away to northern Russia.
12 hours - - - - -	About two days - - - - -	One day.
Westerly and North-westerly gales on the eastern shores of the North Sea.	South-west to North-west gales; strongest in the more northern districts.	Westerly and North-westerly gales; strongest on our North and North-western coasts.
Showery in north and west and in Denmark, fair elsewhere.	Very rough, squally, and showery. Lightning in many cases and some thunder.	Very rough and squally, with showers.
Slight, except at Christiansund where 1.26 in. fell	Not heavy, except at some northern and north-western stations.	Slight, though general.
This disturbance reached the west of Norway when pressure was highest over the Bay of Biscay and lowest over northern Europe, the gradients being somewhat steep. Its effect on the winds on our coasts was slight, except in the north, where some gales were felt locally.	This disturbance advanced from the westward where (so far as our area is concerned) pressure was highest over France and Germany and lowest to the northward of our Islands, the gradients being rather steep over the northern districts but moderate in the south. On approaching Norway its centre moved north-eastwards, apparently feeling the influence of a large anticyclonic system then lying over Russia.	This advanced as No. LIX. (to which it seemed to be subsidiary) was passing away over Lapland. Its rate of progress appears to have been very rapid until it reached Scotland. The effect of No. LIX. in modifying the gradients on its eastern side was such as to completely mask the depth of the disturbance and the steepness of the gradients on its southern and western sides.

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS.—OCTOBER, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XX. October 2-7.	No. XXI. October 20-21.	No. XXII. October 24-25.
Form - - - - -	Very irregular and variable; central area oval at first.	Irregular, oval - - - - -	Unknown.
Size - - - - -	Large - - - - -	Large - - - - -	Small.
Height - - - - -	Small to moderate; highest readings recorded were 30.7 + inches, on the 5th.	Moderate; highest readings recorded 30.4 + inches on the 20th.	Unknown; apparently slight.
Where first observed - - -	To the south-westward of our Islands	Over the Bay of Biscay and our south-western coasts.	Off the west of Ireland.
Direction of Motion - - -	North-easterly till morning of 6th, then stationary.	Easterly - - - - -	South-easterly and southerly.
Rate of Motion - - - - -	Very slow to <i>nil</i> - - - - -	Moderate - - - - -	Slow to moderate.
Regions passed over - - -	Bay of Biscay and the British Islands	Bay of Biscay, France, and England -	Our south-western districts and Bay of Biscay.
Termination - - - - -	Dispersed - - - - -	Travelled away to Germany and western Russia.	Moved away towards Spain.
Accompanying Winds - - -	Light; North-westerly to South-westerly as it advanced, North-easterly and Easterly in its rear.	South-westerly in the north, very light and variable over England and France.	Northerly at first (in Ireland), then backing to West as the centre passed southwards.
Weather - - - - -	Fine, but cool - - - - -	Fine and cool; fogs locally - - -	Fair, but dull and cool.
REMARKS - - - - -	<p>This system advanced in the rear of depression, No. LV. (see p. 100). After reaching the northern parts of our Islands (on the evening of the 5th), it spread north-eastwards and formed a band of high pressure which at 8 a.m. on the 6th lay from west-south-west to east-north-east across Ireland, Scotland, the northern parts of the North Sea and the southern parts of Scandinavia. On the 7th the band was still more extensive, but was moving slowly to the southward, and later on it broke up completely, as depression No. LVI. approached our north-western coasts from the north-north-westward.</p> <p>This system appears to have been lying to the south-westward of our Islands for several days before it advanced eastwards. (See Weekly and Daily Weather Reports.) On the 22nd its centre had reached Poland and western Russia, while its western side extended over Germany, the Netherlands, and the east of France.</p> <p>This system advanced to our western coasts very abruptly on the 24th, at a time when a large high-pressure area lay over the Continent (see Weekly Weather Report, p. 170); but the advance of the cyclonic system No. LIX. brought about its transference to a more southerly position.</p>		

SECTION III.

REMARKS FOR OCTOBER 1884.

(Tables XIX. and XX. with Plates XX. and XXI.)

Pressure.—The mean pressure of the atmosphere at 8 a.m. varied from about 30·14 inches at Valencia and Scilly to 29·71 inches at Sumburgh Head, the gradients being slightly steeper over the northern parts of the kingdom than elsewhere. This distribution is favourable for a preponderance of Westerly (South-west to North-west) wind, and it needs only a glance at the wind-roses on Plate XX. to see that this was the case. Compared with a map showing the average conditions for the corresponding month in the 20 years, 1866–80,* the values for the present year show an excess—varying from about 0·3 inch at our extreme south-western stations to about 0·1 inch over the north of Scotland, and to only a few thousandths of an inch at Sumburgh Head. The gradients are therefore steeper than the average; and it will be seen that the distribution is favourable for winds from a more Westerly point than usual at this time of year. The highest readings were recorded on the 5th, while the anticyclone No. XX. was passing over the kingdom, but the lowest occurred (1) at the northern stations on the 26th or 28th as the depressions Nos. LIX.† and LX.† passed over, and (2) at the more southern stations on the 9th, as the smaller disturbance, No. LVI., moved eastwards over our southern counties. The range was considerable, especially in the north, where the low readings of the 28th were about two inches lower than the readings recorded on the 5th.

Movements of Depressions.—The depressions which appeared near our Islands during the month passed mainly over the northern parts of our area, and, as a rule, moved in a north-easterly or east-north-easterly direction. Two small disturbances, however, travelled in a south-easterly direction across Scandinavia, and one (No. LVI.†) changed its course several times, as will be seen on referring to Map 2 and to the Table of Cyclonic Systems on pages 100–101. One disturbance (No. LIX.†) was very large and deep, and in fact the systems observed this month have, on the whole, been much larger than those observed in September or during the summer months.

Anticyclones.—Three of these systems passed over our area during the month—two of them large and one apparently small. The former moved in a north-easterly or easterly direction over France and our Islands, but the latter appeared very temporarily off our western coasts on the 24th, and after moving south-eastwards to our south-western stations and the mouth of the Channel, either dispersed or was forced southwards out of our area by the advance of depression No. LIX.† Neither of them call for special remark.

Winds.—These were mainly Westerly (South-west to North-west), the South-westerly tendency preponderating in the more northern districts, and the North-westerly in the south. Winds from the eastern half of the compass were conspicuous by their absence from the northern stations, and even over the southern counties they were but rarely experienced. At Jersey, however, they were more numerous, and in the west of France still more so. The force of the wind was decidedly greater than in any previous month this season, and a marked increase was observed in the number of gales (chiefly South-westerly or Westerly) recorded in all parts of the Kingdom.

Temperature.—The mean (sea level) temperature of the month varied from 54° off our extreme south-western coasts to a little below 49° at the inland stations in the northern parts of Ireland and England, and to about 47° in the Hebrides and Orkneys. The type of distribution was thoroughly wintery, except (apparently) in Scotland, and the values indicated were slightly (less than a degree) below the averages in Ireland and England, but

* See the "Meteorological Atlas of the British Isles," published by authority of the Meteorological Council, 1883.

† See Section II. and Map 2 Plate XXI. for the history and tracks of depressions.

slightly above them in Scotland. High readings were recorded on several occasions, but, taken as a whole, they occurred most generally between the 5th and 7th (while anticyclone No. XX. was passing over), and again on the 16th, at a time when moderate and regular gradients for North-westerly and Westerly winds were prevailing, with fair dry weather. The lowest readings were registered in most places between the 10th and 12th, during the cold Northerly winds which prevailed in the rear of depression No. LVI., but over some parts of our eastern counties the cold was greatest on the 25th, while in the North of Scotland was felt most on the 29th, on the anticyclonic ridge which was formed in the rear of depression No. LX. The range varied from about 35° or 36° over the inland parts of the southern counties of England to about 30° over our northern counties and central Ireland, to 28° at Sumburgh Head and Stornoway, and to between 21° and 23° at Valencia and in the Channel Islands.

Vapour Tension.—This was lowest inland and highest on the south-western coasts, the mean values recorded ranging from between 0·26 in. and 0·27 in. over the inland districts to 0·32 in. on our east coast, and to about 0·34 in. at our extreme south-western stations. *Relative Humidity*, however, was lowest (80 to 85 per cent.) on our western coasts, highest (90 per cent.) off our north-west coasts, and (95 per cent.) off the east coast of England.

Rainfall.—This was slight, except at our extreme north-western and extreme south-eastern stations. In the former regions the fall was increased by the frequent approach of depressions from the Atlantic, while in the latter there was a very heavy local fall in the rear of depression No. LVI., affecting much the same parts as felt the heavy downpour in the rear of depression No. L., to which attention was drawn in the September report (page 87). Over the greater part of England the showers experienced were very slight.

Bright Sunshine.—This was deficient. On the whole the values recorded were greatest along our south and east coasts and least in the north-west, but on plotting the values it appears that the change from the one extreme to the other was very irregular. Assuming that the total duration possible at each station is represented by 100, the amounts recorded vary from 41 at Jersey to between 37 and 33 along our south coast, to 30 along our east coasts, and to between 20 and 30 in most other places. The percentages for Glasgow (16), Barrow (20), Leicester (20), and London (21), are all very low for their geographical position.

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS

MADE AT

TELEGRAPHIC REPORTING STATIONS IN THE BRITISH ISLANDS

DURING THE MONTH OF OCTOBER, 1884.

TABLE XIX.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
Observations are made at 8 a.m. daily, but the Numbers of Days of Rain, Snow, Hail,
(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head	ins. 29°799	46°8	42°3	50°7	46°5	30	28th	58	5th
	Wick	29°817	47°4	41°3	52°5	46°9	31	29th	60	6th
	Stornoway	29°850	46°9	42°2	51°5	46°9	32	29th	60	6th
1. SCOTLAND, E.	Nairn	29°851	46°8	42°8	53°5	48°2	33	29th	62	2nd, 6th
	Aberdeen	29°858	46°1	40°8	54°7	47°8	30	29th	62	5th, 6th, 17th
	Leith	29°923	47°4	42°3	54°8	48°6	33	11th	64	5th
2. ENGLAND, N.E.	Shields	29°965	47°5	41°9	54°5	48°2	32	11th	61	18th
	York	30°016	46°1	40°6	55°8	48°2	33	11th	62	18th, 19th
	Spurn Head	29°993	48°8	44°5	53°5	49°0	37	11th, 12th	58	2nd
3. ENGLAND, E.	Yarmouth	30°006	49°2	43°5	54°6	49°1	35	29th, 30th	60	6th, 17th
	Cambridge	30°057	47°2	39°7	56°8	48°3	28	25th	62	2nd, 6th, 7th, 18th.
4. MIDLAND COUNTIES	Loughborough	30°058	45°8	40°2	55°4	47°8	30	5th	64	16th
	Oxford	30°092	46°4	41°4	56°1	48°8	35	29th, 30th	63	2nd, 16th
5. ENGLAND, S.	London	30°085	48°1	42°4	57°3	49°9	32	29th	64	1st
	Dungeness	30°064	49°6	44°5	56°6	50°6	33	25th	63	1st
	Hurst Castle	30°109	49°5	44°7	57°8	51°3	35	13th	64	16th
6. SCOTLAND, W.	Ardrossan	29°963	49°0	44°2	54°3	49°3	37	10th, 27th, 29th	59	4th, 6th
7. ENGLAND, N.W.	Hawes Junction*	28°778	43°8	38°8	49°3	44°1	25	11th	55	2nd, 5th
	Barrow-in-Furness	30°016	48°7	45°3	54°4	49°9	36	13th	61	7th
	Liverpool (Bidston)	30°045	48°6	45°9	54°3	50°1	38	9th	62	31st
	Holyhead	30°066	51°0	47°8	54°7	51°3	39	11th	59	2nd, 16th
8. ENGLAND, S.W.	Pembroke	30°093	51°9	48°6	55°2	51°9	41	28th	60	2nd
	Prawle Point	30°144	50°9	45°2	57°4	51°3	35	10th	64	1st, 4th
9. IRELAND, N.	Donaghadee	30°021	48°1	43°5	54°1	48°8	35	29th	60	4th, 16th, 17th
	Mullaghmore	30°030	49°3	46°1	54°5	50°3	39	10th	62	5th
10. IRELAND, S.	Parsonstown	30°105	45°4	40°8	54°7	47°8	32	11th, 12th, 25th	62	2nd
	Valencia	30°143	51°8	47°6	57°2	52°4	41	11th	62	5th, 6th
	Roche's Point	30°133	49°8	45°6	56°6	51°1	36	11th	65	15th
CHANNEL ISLANDS	Scilly (St. Mary's)	30°140	54°2	50°5	56°7	53°6	41	11th	63	2nd
	Jersey (Noirmont)	30°130	52°7	49°0	57°1	53°1	39	11th	62	1st, 2nd

* Hawes Junction is 1,135 feet above Mean Sea Level and the

- TABLE XIX.

REPORTING STATIONS in the BRITISH ISLANDS, during the Month of October 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred.
(beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Show.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calms.
ins.	°/80	8°5	ins.	ins.																	
0°270	8°5	8°5	4°59	0°83	25th	26	0	0	0	1	20	4	6	4	0	0	4	4	9	4	0
°291	89	7°0	3°63	0°80	27th	20	3	3	0	3	15	5	2	0	0	0	7	2	4	13	3
°288	91	7°7	5°89	0°79	27th	24	0	6	0	4	17	11	4	0	0	0	6	9	9	3	0
°275	86	6°6	1°99	0°49	9th	16	0	1	0	8	16	7	2	0	0	0	0	6	11	5	7
°262	84	4°7	2°69	0°67	10th	18	0	2	0	11	8	6	2	0	0	0	5	6	9	6	3
°272	84	5°5	1°20	0°41	9th	14	0	1	0	8	3	2	2	0	0	2	3	3	19	2	0
°287	88	5°1	1°61	0°73	11th	12	0	1	0	12	10	7	2	0	0	0	5	10	9	3	2
°266	86	5°5	0°77	0°15	11th, 25th	13	0	0	0	12	11	1	5	1	1	3	3	4	10	4	0
°325	94	4°7	1°56	0°72	10th	12	0	0	0	10	5	4	3	1	0	1	2	6	11	6	1
°317	91	5°5	4°18	2°22	10th	18	0	0	0	7	4	3	2	3	0	2	0	6	10	8	0
°291	91	6°8	1°33	0°42	10th	8	0	0	1	8	18	0	5	0	1	0	5	4	8	4	4
°271	88	7°3	1°11	0°25	8th	13	1	1	0	2	16	13	2	1	1	3	1	3	13	4	3
°277	89	6°6	0°83	0°42	9th	8	0	0	1	10	16	1	1	1	1	2	3	7	10	5	2
°280	84	7°2	1°01	0°17	9th	10	0	0	0	7	18	3	1	3	0	2	3	5	6	8	3
°300	85	6°0	1°96	0°67	9th	11	0	0	0	9	10	2	7	2	0	2	1	1	9	8	1
°320	90	5°4	1°12	0°36	9th	13	0	1	0	8	3	3	6	3	4	1	0	3	5	9	0
°303	87	7°8	4°17	0°82	31st	19	0	2	0	4	20	8	3	2	1	1	3	4	8	7	2
°259	91	6°8	4°81	0°92	29th	19	1	0	0	5	15	2	6	2	0	1	3	6	9	2	2
°283	82	7°1	3°05	0°61	26th	16	0	1	1	1	12	4	5	4	2	3	2	2	5	8	0
°278	81	7°2	1°48	0°36	8th	16	0	1	0	2	15	2	2	2	2	3	2	3	12	5	0
°309	82	6°0	1°55	0°31	8th	19	0	1	0	6	8	7	3	1	2	2	4	3	11	4	1
°306	79	7°1	2°03	0°55	9th	19	0	0	0	3	12	7	3	3	3	2	2	3	7	8	0
°338	91	5°8	1°30	0°36	9th	17	0	0	0	8	8	4	5	1	1	1	2	4	4	13	0
°298	89	6°0	2°18	0°28	9th	17	0	0	0	5	10	5	3	3	1	0	2	6	10	6	0
°294	84	7°6	5°56	0°98	31st	23	0	7	0	2	10	12	4	1	1	3	3	8	6	5	0
°267	89	7°7	2°85	0°95	23rd	20	0	0	0	5	21	0	1	0	0	2	7	6	4	2	9
°336	89	8°3	4°42	1°36	31st	26	0	1	0	2	21	7	4	2	0	2	4	5	6	6	2
°315	88	5°1	1°07	0°18	2nd	18	0	0	0	8	7	6	7	0	1	1	2	4	9	7	0
°340	81	7°7	1°05	0°45	8th	17	0	2	0	2	14	3	5	2	2	2	2	2	8	7	1
°334	84	6°4	3°09	0°66	9th	20	0	5	0	4	8	5	4	4	3	2	1	4	4	9	0

Barometric observations at this station are not corrected for altitude.

TABLE XX.

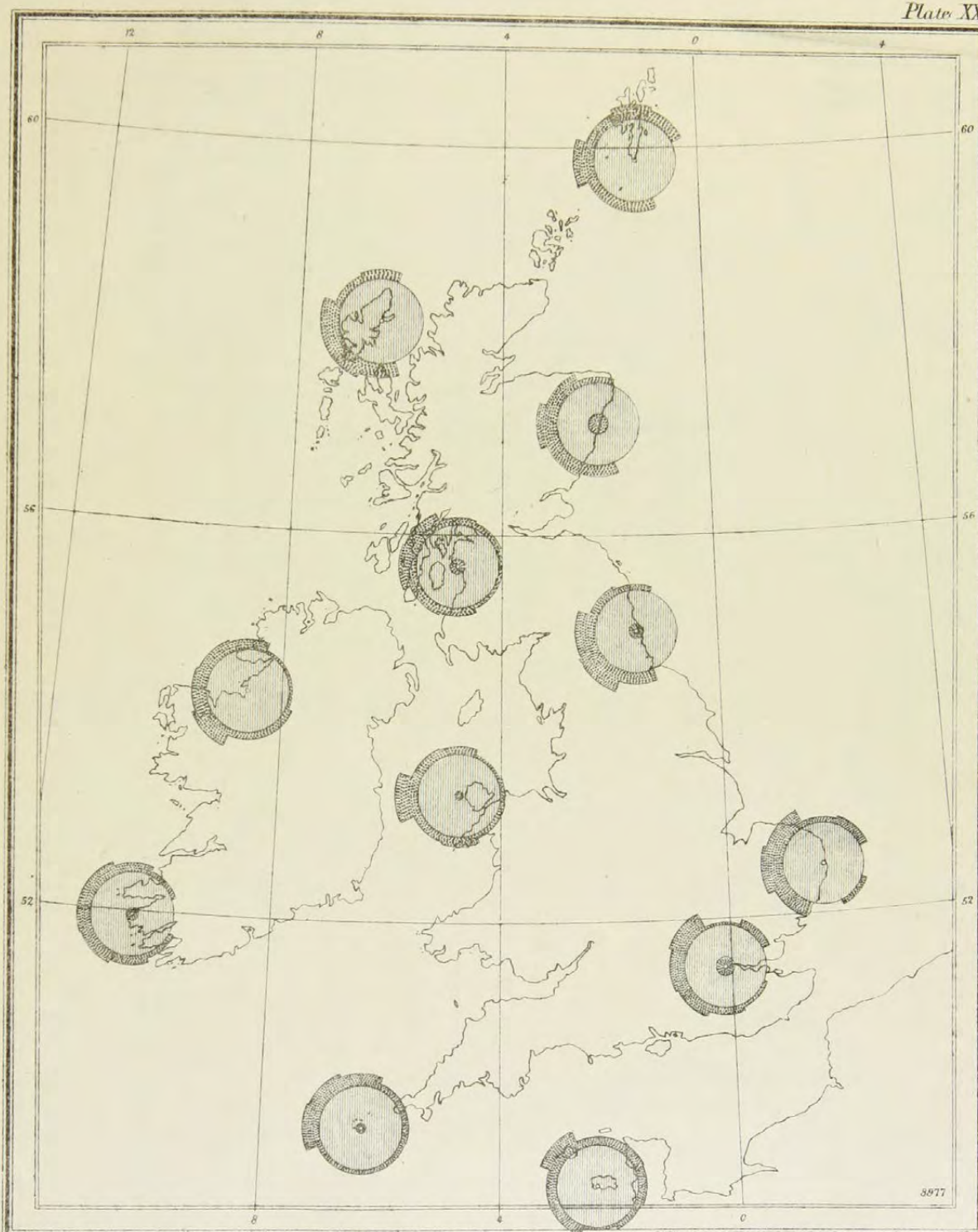
OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of October 1884.

STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per-centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.			
STORNOWAY - - -	o	o	o	o	*	o	*	*	59	19
ABERDEEN - - -	*	*	*	*	*	*	*	*	90	29
ALNWICK CASTLE - -	41'9	53'1	47'5	33	10th	60	15th	1'81	—	—
SCARBOROUGH - - -	*	*	*	*	Not yet complete.			*	—	—
YORK - - -	*	*	*	*	*	*	*	*	96	30
HILLINGTON - - -	40'8	55'4	48'1	31	25th	63	2nd	2'67	93	29
GELDESTON - - -	42'4	56'4	49'4	31	25th	63	2nd	3'63	102	31
CAMBRIDGE - - -	*	*	*	*	*	*	*	*	105	32
ROTHAMSTED - - -	40'7	55'2	48'0	30	25th	62	1st, 16th	1'70	—	—
BAWTRY - - -	40'5	55'6	48'1	32	11th	64	18th	1'04	—	—
LEICESTER - - -	41'3	55'4	48'4	32	5th, 29th	65	16th	1'52	64	20
CHEADLE - - -	41'1	52'3	46'7	31	11th	62	16th	1'51	—	—
CHURCHSTOKE - - -	40'5	54'7	47'6	32	11th, 13th, 29th.	63	16th	2'01	93	29
HEREFORD - - -	41'1	56'5	48'8	29	29th	65	16th	0'93	—	—
CIRENCESTER - - -	40'0	54'4	47'2	31	29th	62	2nd, 16th	1'04	100	31
OXFORD - - -	*	*	*	*	*	*	*	*	93	29
LONDON - - -	*	*	*	*	*	*	*	*	69	21
MARLBOROUGH - - -	39'7	56'0	47'9	30	13th, 29th	64	2nd, 16th, 18th	1'01	100	31
STRATHFIELD TURGIS -	38'5	58'0	48'3	25	30th	65	16th	0'81	—	—
HASTINGS - - -	45'8	56'8	51'3	38	11th, 12th	66	16th	2'66	108	33
SOUTHAMPTON - - -	43'4	58'5	51'0	32	29th	67	16th	0'87	120	37
LAUDALE - - -	43'4	53'4	48'4	34	29th	59	6th, 31st	11'37	—	—
GLASGOW - - -	42'6	52'7	47'7	33	11th	58	6th	3'59	52	16
SILLOTH - - -	43'8	53'4	48'6	31	13th	61	2nd, 4th	2'41	73	23
DOUGLAS - - -	44'9	54'3	49'6	37	13th, 25th	60	16th	1'70	98	31
NEWTON REIGNY - - -	40'9	52'8	46'9	29	13th	58	5th, 6th, 16th	2'14	75	24
STONYHURST - - -	41'9	54'0	48'0	33	11th	59	1st, 26th, 31st	4'06	79	25
BLACKPOOL - - -	44'2	54'0	49'1	29	13th	59	2nd	2'54	74	23
MANCHESTER - - -	42'6	53'1	47'9	31	11th	60	31st	2'31	—	—
LLANDUDNO - - -	46'5	55'3	50'9	40	11th	62	31st	1'42	65	20
PEMBROKE - - -	*	*	*	*	*	*	*	*	93	29
ARLINGTON - - -	43'5	54'2	48'9	33	29th	59	2nd	3'97	—	—
CULLOMPTON - - -	41'9	57'2	49'6	28	29th	64	2nd	0'96	80	25
FALMOUTH - - -	48'7	56'2	52'5	41	10th, 11th	61	2nd	1'96	104	32
PLYMOUTH - - -	44'2	57'3	50'8	34	29th	63	2nd	1'61	85	26
JERSEY - - -	*	*	*	*	*	*	*	*	133	41
LONDONDERRY - - -	43'3	55'2	49'3	36	10th, 11th, 29th	64	5th	4'35	—	—
MARKREE CASTLE - -	41'3	54'7	48'0	31	6th	61	2nd, 6th, 16th	4'95	65	20
BROOKEBOROUGH - -	41'0	53'9	47'5	31	25th	62	5th, 6th	5'21	—	—
ARMAGH - - -	42'6	53'9	48'3	34	11th, 29th	60	2nd, 31st	3'22	68	21
DUBLIN - - -	44'6	55'9	50'3	34	11th	65	2nd	0'83	107	33
PARSONSTOWN - - -	*	*	*	*	*	*	*	*	75	25
WATERFORD - - -	41'7	56'8	49'3	32	29th	65	15th, 16th	1'25	—	—
VALENCIA - - -	*	*	*	*	*	*	*	*	94	29
FOYNES - - -	44'1	56'1	50'1	37	11th	69	3rd	2'06	—	—

* Information to be found in Table XIX.

MONTHLY WIND CHART FOR OCTOBER 1884.

Plate XX



To face p. 108.

DANGERFIELD LITH 22 BEDFORD ST COVENT GARDEN.

A map of the British Isles (Great Britain and Ireland) with several lines drawn across it. These lines represent isobars and isotherms. The lines are labeled with numerical values: 29.70, 29.75, 29.80, 29.85, 29.90, 29.95, 30.00, 30.05, 30.10, and 30.15. The lines generally trend from the northwest to the southeast. The map shows the coastlines of the islands and the surrounding sea.

[illegible]

A map of the North Atlantic region showing isotherms for the month of May. The map includes the British Isles, Iceland, and parts of North America and Europe. Isotherms are labeled with values such as 47°, 48°, 49°, 50°, 51°, 52°, 53°, and 54°. A dashed line indicates the 47° isotherm.

Map of Great Britain and Ireland showing the distribution of the number of species of the genus *Lymnaea* per 100 km². The map is divided into numerous small regions, each labeled with a numerical value representing the species density. The values range from 0.77 to 5.89. The highest densities are found in the north and west, while the lowest are in the south and east.

MONTHLY WEATHER REPORT.

NOVEMBER 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather during November was quiet. Pressure was in excess of the average by about two-tenths of an inch. Temperature was at about its normal value, except over our eastern counties and along our south-western coasts—in both of which regions it was rather below the average. The winds were very variable, and, as a rule, moderate in force; gales were only occasionally reported, and were not severe. Rainfall was deficient, except at our western and northern stations. Bright sunshine, also, was very deficient.

At the close of the month the Northerly winds which had prevailed for many days had given way, and mild damp Southerly breezes were appearing in all parts of the kingdom.

November 1–9.—During this period the class of weather and pressure distribution over our Islands was partly cyclonic and partly anticyclonic, sometimes one and sometimes the other system being the more prevalent, but the type was Southerly and South-westerly. Temperature was above its normal value for the time of year, especially over the southern and eastern parts of the kingdom, and while the rainfall was in excess at our more northern and western stations, it was in defect in the south, where the amount of bright sunshine was considerable. During this period two large well-marked depressions passed over our area—one (No. LXI.)* travelling in a north-easterly direction, at a long distance outside our extreme west and north-west coasts, while the centre of the second (No. LXII.)* passed directly over Ireland and Scotland, its movement being about North-easterly. The first of these brought Southerly gales to the western parts of the kingdom, and a great deal of rain, while comparatively little rain fell over our southern and eastern counties; with the second the rainfall was much heavier (especially in the west and north), and in Ireland it was accompanied by strong Northerly winds. On the disappearance of the latter disturbance the weather cleared up in almost all places. There was one other occasion also on which a great deal of rain fell over the United Kingdom—especially at our western stations. At the close of October a large high pressure area lay over Germany and France, while decreasing gradients for South-westerly and Southerly winds prevailed over the United Kingdom. On November 1st a new (but smaller) high-pressure system advanced towards our south-western coasts and the Bay of Biscay, bringing a temporary spell of North-westerly winds to Ireland, while the southerly current still held over Great Britain and France. The distribution of pressure thus produced over the Bay of Biscay and the southern parts of our area was for a time complex (see the maps in the Daily and Weekly Weather Reports for this period), a shallow subsidiary depression appearing over Ireland on the evening of the 1st, and a long “trough” or band of low pressure over the Bay of Biscay and (subsequently) over the west of France. Fair mild weather was experienced with the Southerly wind, but heavy cold rain accompanied that from the northward, and spread eastward with the Northerly wind, but decreased greatly in amount by the time it reached the eastern parts of England, when the system broke up slowly. By the afternoon of the 3rd the weather had cleared everywhere, and the cyclonic system No. LXI.* began to approach our western coasts.

November 10–16.—During this period the distribution of pressure was anticyclonic, and the type variable. With its advent the winds fell light except at the western stations, where, owing to the proximity of some cyclonic system over the Atlantic they blew strongly from

* See Section II., and Map 2, Plate XXIII, for the history and tracks of depressions.

South on the 11th. Temperature decreased over England and the weather cleared at all but our extreme western stations. On November 12th (pressure being then highest to the eastward of the North Sea, and lowest off our north-west coasts) a second high pressure system appeared off the west of Ireland; a "col" was thus formed over England, and subsequently moved northward to the southern parts of Scotland and the Irish Sea (see Daily and Weekly Reports for 12th and 13th). Temperature now fell very generally, especially over Ireland and Scotland, and while variable South-westerly and Westerly breezes set in at the northern stations, light Easterly and North-easterly winds were felt in the south, while a zone of calms and variable airs separated the two currents. The weather was dry, and much fog prevailed over England. The fall of temperature within the limits of this "col" on the night of the 13th was singularly well defined, the minima reported being as low as 24° at Parsonstown, 27° or 28° at Nairn, Aberdeen, and Leith, 33° at Ardrossan, and 34° at Valencia. To the northward (where the wind was Westerly or South-westerly) the values were 41° in the west of Norway, and 42° at Sumburgh Head, and to the southward (where the wind was Easterly) they were 40° in London, 45° at Loughborough, 44° at Holyhead, 45° at Hurst Castle and Pembroke, 46° at Prawle, and 49° at Scilly. On the 14th the western anticyclone had disappeared, but that in the east extended across the North Sea and our Islands, causing a continuance of light to moderate Easterly winds over France, England, and Ireland, while South-westerly breezes prevailed in the north of Scotland and west of Norway; the weather was quiet, cold, dry, and foggy. On November 16th pressure began to give way over the Baltic, while it increased in the north of our Islands.

November 17-26.—The area of highest pressure was thus transferred from Germany and the Baltic to the north-westward of our Islands, and throughout nearly the whole of this period anticyclonic conditions continued to prevail over the United Kingdom, the type of distribution being Northerly to North-easterly. To the eastward of the North Sea, however, the conditions were cyclonic, and these occasionally spread in a modified degree to the eastern parts of our Islands. Temperature was low everywhere, the air was dry and somewhat keen, and a good deal of cloud and haze prevailed over our Islands generally. On November 20-21 a temporary interruption of the quiet dry weather was caused by the advance of a well-marked, but not deep, depression (No. LXIII.*), to the west of Norway. This apparently came from the north-westward early on the 20th, and on reaching Norway altered its course somewhat decidedly and passed rapidly in a southerly direction down the eastern shores of the North Sea to Holstein, where its centre lay at about 6 p.m. It then moved south-westwards slowly, reaching Belgium on the following morning, and finally passed southwards towards northern Italy, where it dispersed. The effect of this disturbance was to produce strong North-westerly to North-easterly winds and gales on almost all our coasts, accompanied by showers of snow, sleet, and cold rain, and in some places by thunder and lightning. On its disappearance, however, the barometer rose, and the anticyclone again spread eastwards over the British Islands with fair cold weather.

November 27-30.—The high pressure area in the west now moved southwards and south-eastwards. The type of weather became North-westerly, and cyclonic conditions were established in the east and north, and spread gradually to the other parts of the kingdom. Two depressions appeared over our area, almost simultaneously, on the 27th. One of them (No. LXIV.*) advanced towards our northern coasts from the west-north-westward, while the other (No. LXIV.*) came over the northern parts of Scandinavia from the north-north-westward. The latter was shallow and moved comparatively slowly, reaching central Sweden by the morning of the 28th, and Stockholm by 8 a.m. on the 29th, while the former travelled more quickly, and reaching Holstein by 8 a.m. 28th, moved eastwards over North Germany to the neighbourhood of Königsberg. Another (small) disturbance was developed near the Helder early on the 29th, and moving eastwards reached the southern shores of the Baltic next day, where it formed part of a large low-pressure system, having two minima. Gradients for South-westerly winds then became general over the United Kingdom, and on the 30th a series of cyclonic disturbances began to appear over our Islands, the consideration of which belongs properly to the report for December.

* See Section II., and Map 2, Plate XXIII. for the history and tracks of depressions.

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—NOVEMBER 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. LXI. November 4-6.	No. LXII. November 6-8.
Form - - - - -	Uncertain; apparently somewhat oval - -	Oval, but varying.
Size - - - - -	Large - - - - -	Moderate.
Depth - - - - -	Deep - - - - -	Moderate; gradients rather steep near the centre.
Where first Observed - - - -	Off the west of Ireland - -	Off the south-west of Ireland.
Direction of Motion - - - -	North-easterly - - - - -	North-easterly.
Rate of Motion - - - - -	Moderate - - - - -	Moderate.
Regions passed over by Steepest Gradients	Ireland, Scotland, and the north-west of England	The western and northern parts of the United Kingdom.
Termination - - - - -	Travelled away to the north-eastward, along the Norwegian coast.	Travelled away to the north-eastward, along the Norwegian coast.
Time under Observation - - -	Two days - - - - -	Two days.
Accompanying Winds - - - -	Southerly and South-westerly, strong; gales in the west and north.	Southerly to Westerly over Great Britain, and Northerly to Westerly over Ireland; gales in many places.
" Weather - - - - -	Mild, squally, rainy - - - - -	Rough, very squally, changeable, and rainy.
" Rainfall - - - - -	Very slight in south-east, but heavy in west and north-west.	General, and heavy in the west and north; some sleet in the west.
REMARKS - - - - -	<p>This depression appeared when pressure was highest at the Continental stations, and lowest over the Atlantic to the north-westward of our Islands. Its centre passed along at a great distance from our coast.</p> <p>It had no sooner disappeared from our area than No. LXII. appeared in the south-west.</p>	<p>The distribution of pressure at the time of the approach of this depression was of a southerly type, without any apparent complication.</p> <p>The system's centre passed directly over Ireland and Scotland, and the Northerly winds on its western side blew hard in the west of Ireland.</p>

SECTION II.—*continued.*

TABLE OF CYCLONIC SYSTEMS.—NOVEMBER 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. LXIII. November 20-21.	No. LXIV. November 27-29.	No. LXIVa. November 27-29.
Form - - - -	Somewhat oval, but varying - -	Nearly circular - - - -	Nearly circular.
Size - - - -	Large - - - -	Moderate - - - -	Moderate.
Depth - - - -	Moderate - - - -	Doubtful; apparently moderate -	Moderate.
Where first Observed - -	Off the west of Norway - -	Over the north of Norway - -	A little to the north-westward of Cape Wrath.
Direction of Motion - -	South-easterly, then southerly, south-westerly, and again southerly.	Southerly - - - -	South-easterly.
Rate of Motion - - -	Rapid at first, then moderate - -	Moderate - - - -	Moderate.
Regions passed over by Steepest Gradients.	British Islands and North Sea -	Scandinavia - - - -	British Islands and North Sea.
Termination - - -	Dispersed over Piedmont - -	Dispersed over the Baltic after passing out of our area.	Passed away to the Baltic.
Time under Observation -	About 36 hours - - - -	Two days - - - -	About 36 hours.
Accompanying Winds - -	North-westerly, Northerly, and North-easterly gales and strong winds.	Variable over Scandinavia. North-westerly in our Islands. (See System LXIVa.)	Westerly and North-westerly; strong; a moderate gale in places. Air raw.
Weather - - -	Very squally, with sleet, cold rain, and in several places lightning.	Weather in our Islands not directly affected.	Squally, with cold showers.
Rainfall - - -	General, but not heavy as a rule -	Unknown - - - -	Slight, and not very general; mainly cold showers.
REMARKS - - -	<p>This system approached Norway from the north-westward at a time when northerly and north-westerly gradients prevailed on all our coasts. Its motion continued rapid until the centre reached Holstein, when on changing its direction the movement slackened considerably, and the system began to fill up.</p>	<p>This disturbance also appeared while gradients for Northerly and North-westerly winds were prevalent over our Islands. Its direct influence on the weather over our Islands was inappreciable, but it appears to have taken the part of a primary disturbance to which No. LXIVa. became subsidiary on reaching our coasts.</p>	<p>This depression reached the north of Scotland just as No. LXIV. was appearing over the north of Norway. The two systems united over the Baltic, and were subsequently joined by a third shallow depression which was formed near the Helder on the 29th. The combined system then moved south-eastwards to western Russia.</p>

SECTION II.—*continued.*

TABLE OF ANTICYCLONIC SYSTEMS, NOVEMBER 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. XXIII. November 8-16.	No. XXIV. November 12-13.	No. XXV. November 18-29.
Form - - - -	Somewhat oval, but varying - -	Unknown.	
Size - - - -	Large - - - -	Unknown.	
Height - - - -	Small to moderate - -	Unknown.	
Where first Observed - -	Over France - - - -	Off the south-west of Ireland.	
Direction of Motion - -	North-easterly, but variable - -	Northerly.	
Rate of Motion - - - -	Slow - - - -	Very slow.	
Regions passed over - -	France, and countries to the eastward of the North Sea.	The Atlantic, to the westward of Ireland.	During this period a large high-pressure area lay off the west of Ireland, its eastern parts generally stretching over the United Kingdom, giving us cold, dry weather, and some fog. Of its form, size, and height nothing is known certainly at present, but apparently it was a large, well-formed system, with somewhat decided gradients on its eastern side. Towards the close of the month it moved southwards and disappeared from our area.
Termination - - - -	Became a large permanent high-pressure to the eastward of the North Sea.	Apparently dispersed.	
Accompanying Wind - -	Light and variable - - - -	North-westerly, moderate.	
Weather - - - -	Fine and dry; fogs locally. Not cold at first.	Fine and bright.	
REMARKS - - - -	This anticyclone advanced as the cyclonic system No. LXII. passed away. When it reached the eastern shores of the North Sea, steep gradients for Southerly winds appeared (very temporarily) over our Western districts on the 11th, but these broke up next day, and the anticyclonic system No. XXIV. appeared off Valencia. The system continued over the eastern shores of the North Sea till the 16th.		
	Between this system and No. XXIII. a well-defined "col" was formed, and in this the temperature fell rapidly during the night of the 12th. (See the daily and weekly reports.) At 8 a.m. on the 13th the col lay across Scotland, and the temperature at Aberdeen was 9° lower than that at Sumburgh Head, 10° lower than that at Spurn Head, and 18° lower than that at Scilly.		

SECTION III.

REMARKS FOR NOVEMBER 1884.

(Tables XXI. and XXII., with Plates XXII. and XXIII.)

Pressure.—The mean pressure at 8 a.m., as shown by Map 1, Plate XXIII., varied from about 30·17 inches or 30·18 inches over the southern parts of England and Ireland to 29·95 inches at Sumburgh Head. This distribution is favourable for a predominance of light Westerly winds. It will be seen on referring to the wind-roses on Plate XXII., that, while at all stations the winds experienced blew mainly from the western half of the compass, they varied greatly in direction, both to the northward and southward of that point, while from the summary for the month given in Section I., pp. 109 and 110, it will be gathered that their force was, as a rule, light to moderate. The values, when compared with the averages for the corresponding portion of the 20 years 1861–80, show an excess for the present month amounting to about 0·2 inch at our northern stations, and 0·25 inch in the south. Over the northern half of the kingdom the gradients are very regular, but the isobar marked 30·15 exhibits a peculiar dip in passing over St. George's Channel. This is indicated by both the Scilly and St. Ann's Head readings, and a tendency to a similar, but less marked, defect of pressure is shown by the average values for a large number of years. The highest readings were recorded almost everywhere on the 19th, at which time a large high-pressure area lay off the west of Ireland, and the barometer rose above 30·7 inches at our extreme western stations, and to nearly 30·5 inches over our eastern counties. At the eastern stations, however, the highest readings occurred on the 10th, when anticyclone No. XXIII. extended north-westwards from Germany over our eastern counties. The lowest values recorded occurred at our northern stations on the 5th, while the depression No. LXI* was passing by our extreme north-western coasts; they were, however, very little below 29 inches even in the Hebrides, and in the other parts of our Islands the minimum values recorded were not nearly so low as this, and occurred at very various dates. The range was slight, except in the extreme west and north-west, where it was moderate for the time of year.

Movements of Depressions.—The depressions observed during November were few in number, only five being worth tabulating. Their movements (as shown on Map 2, Plate XXIII.) were various,—two having travelled in a north-easterly direction over or outside our western coasts, while the others moved from north-west to south-east over Scandinavia and the North Sea. One of these, on reaching Holstein, changed its course to the south-westward and southward, but as often occurs with such erratic movements, the system then filled up. Early on the 29th a shallow depression was developed near the Helder, and passed eastwards to North Germany; the track of this is marked by a broken line on Map 2, but its characteristics are not tabulated.

Anticyclones.—These were three in number (see p. 113), and, excepting that numbered XXIV., call for no special remark. The sudden appearance of No. XXIV. and its equally sudden disappearance are worthy of note, especially as several similar occurrences have been observed during the present year, their effects on our weather being various.

Winds.—These were variable, but mainly from the western half of the compass; at the three most northern stations the percentage of wind from the eastern half was almost *nil*, but further to the southward the Easterly winds prevailed more generally; at Yarmouth and London the percentage was considerable, and at Scilly and Jersey still more so. In force the winds were, as a rule, light to moderate, except on the western and northern coasts, where they frequently blew rather strongly. Gales were most frequent in the West and North, where they blew partly from South-west and partly from North-west. At our eastern stations some gales from a more or less Northerly direction were felt as the depressions LXIII.* and LXIV.* passed by.

* See Section II., and Map 2, Plate XXIII. for the history and tracks of depressions.

Temperature.—The mean (sea level) temperature of the month varied from nearly 50° at Scilly, and nearly 46° in the south of Ireland to somewhere below 41° over the more central parts of Ireland, Scotland, and our eastern counties. These values do not differ appreciably from the averages for the corresponding period in the 20 years 1861–80 except over the east of England and the extreme south of Ireland, in both of which localities the temperature for the present season was rather the lower of the two. Comparing Map 3, Plate XXIII. with that for October it appears that in the course of the month the mean temperature has decreased by about 7° in most places, but by only about 5° on our south-western and western coasts. The highest readings observed were registered between the 5th and 7th, so far as the greater part of England is concerned, but on the 1st at many of the western stations, and on the 11th or 12th at others. At Valencia the same maximum (56°) was recorded on six different days. (See Table XXI.) The lowest readings were recorded on the 30th except in the southern parts of England and Ireland, where the cold was greatest on the 25th. The minimum was much lower in the north-east of Great Britain than in any other part of the kingdom, the thermometer having fallen to 15° both at Aberdeen and Wick, and to 19° at Alnwick Castle on the 30th. This made the range for the month large at the stations named, but, as a rule it was moderate elsewhere.

Vapour Tension was lowest (0·21 in. to 0·24 in.) over the central parts both of Great Britain and Ireland, highest at the coast stations, and especially at those on our south-western coasts, where it varied from 0·26 in. to 0·29 in. *Relative Humidity*, however, was lowest (85 to 90 per cent.) both at our north-eastern and south-western stations, and highest (90 to 94 per cent.) over central England and in the west of Scotland.

Rainfall was short of the average except over the western and northern parts of Ireland and Scotland, where it was slightly in excess. The total amounts collected varied from about an inch at York and Alnwick, and an inch and a quarter at the stations in our south-eastern counties to between three and four inches at Arlington, Holyhead, Glasgow, Mullaghmore, and Brookeborough, to more than four inches at Markree Castle and Sumburgh Head, to five inches at Valencia and Londonderry, to more than seven inches at Stornoway, and to upwards of eleven inches at Laudale (Loch Sunart).

Bright Sunshine.—Assuming the total amount of bright sunshine which could possibly have been registered at each station during the month to be represented by 100, the amounts actually recorded were as low as 10 to 16 over the greater part of England and the south-west of Scotland, 20 to 25 on our extreme south-east coasts, and on the northern coasts of Scotland, and 19 to 28 in Ireland. These values are small for any time of year. The only station at which so much as one third of the possible duration was actually recorded was Jersey.

TABLE XXI.

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
Observations are made at 8 a.m. daily, but the Number of Days of Rain, Snow, Hail,
(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head	ins. 29° 947	41° 2	37° 0	45° 0	41° 0	28	30th	54	8th
	Wick	29° 990	40° 5	35° 3	45° 1	40° 2	15	30th	53	1st, 5th, 8th
	Sornoway	29° 986	42° 5	37° 3	46° 4	41° 9	27	30th	54	11th
1. SCOTLAND, E.	Nairn	30° 005	39° 9	35° 9	45° 1	40° 5	21	30th	55	8th
	Aberdeen	30° 031	40° 6	35° 7	46° 4	41° 1	15	30th	55	1st
	Leith	30° 060	41° 4	36° 9	47° 5	42° 2	22	30th	59	7th
2. ENGLAND, N.E.	Shields	30° 096	42° 4	38° 0	47° 7	42° 9	23	30th	58	1st
	York	30° 135	40° 6	36° 5	47° 6	42° 1	22	30th	59	1st
	Spurn Head	30° 116	43° 3	40° 1	46° 9	43° 5	28	30th	56	2nd
3. ENGLAND, E.	Yarmouth	30° 136	42° 2	39° 0	46° 4	42° 7	25	30th	58	5th
	Cambridge	30° 169	39° 6	34° 6	47° 0	40° 8	22	25th	60	7th
4. MIDLAND COUNTIES	Loughborough	30° 159	39° 5	35° 3	47° 2	41° 3	22	30th	58	2nd, 7th
	Oxford	30° 180	39° 9	36° 4	47° 4	41° 9	26	25th, 30th	60	2nd
5. ENGLAND, S.	London	30° 175	41° 3	37° 6	48° 4	43° 0	25	25th	61	5th, 7th
	Dungeness	30° 154	42° 0	39° 5	49° 0	44° 3	28	25th, 26th	59	6th, 7th, 8th
	Hurst Castle	30° 178	43° 2	39° 2	50° 2	44° 7	25	30th	60	2nd
6. SCOTLAND, W.	Ardrossan	30° 071	42° 6	37° 6	47° 5	42° 6	28	24th, 30th	55	1st
7. ENGLAND, N.W.	Hawes Junction*	28° 862	37° 9	33° 8	42° 1	38° 0	21	30th	53	1st, 7th
	Barrow-in-Furness	30° 112	42° 6	39° 5	47° 4	43° 5	29	30th	56	1st
	Liverpool (Bidston)	30° 135	42° 5	39° 6	47° 3	43° 5	29	30th	59	1st
	Holyhead	30° 138	46° 2	42° 8	49° 5	46° 2	34	30th	56	1st, 9th
8. ENGLAND, S.W.	Pembroke	30° 145	46° 9	43° 2	50° 0	46° 6	35	22nd, 25th	58	1st
	Prawle Point	30° 194	45° 0	40° 9	51° 1	46° 0	30	30th	59	5th
9. IRELAND, N.	Donaghadee	30° 097	43° 6	39° 1	48° 5	43° 8	31	30th	55	1st, 6th
	Mullaghmore	30° 085	44° 5	40° 8	49° 1	45° 0	30	18th	55	10th, 11th
10. IRELAND, S.	Parsonstown	30° 155	38° 5	33° 1	47° 1	40° 1	22	22nd, 23rd	55	6th, 11th
	Valencia	30° 171	45° 0	40° 2	51° 5	45° 9	29	25th	56	4th, 6th, 9th, 10th, 11th, 12th.
	Roche's Point	30° 160	44° 7	40° 1	50° 8	45° 5	33	25th	56	4th
CHANNEL ISLANDS	Scilly (St. Mary's)	30° 155	49° 9	46° 6	52° 1	49° 4	42	25th, 30th	59	1st, 5th
	Jersey (Noirmont)	30° 176	45° 9	43° 4	49° 8	46° 6	36	16th	60	5th

* Hawes Junction is 1,135 feet above Mean Sea Level, and the

TABLE XXI.

REPORTING STATIONS in the BRITISH ISLANDS during the Month of November 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred.

beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calm.
ins. 0.223	% 87	8.2	ins. 4.50	ins. 0.71	7th	25	3	0	0	2	19	1	10	1	0	2	4	5	4	2	2
*218	87	5.5	3.37	0.90	26th	19	1	0	0	9	9	4	4	0	1	0	6	3	3	10	3
*246	90	6.9	7.22	1.50	8th	25	1	2	0	7	14	7	7	1	0	1	5	7	4	5	0
*223	91	7.0	2.76	0.82	26th	18	0	0	0	7	17	2	0	3	1	2	2	6	5	4	7
*215	86	6.0	3.22	0.78	4th	20	2	1	0	8	11	8	4	0	0	0	8	6	4	8	0
*192?	74	6.0	1.46	0.40	12th	14	0	0	0	8	11	2	2	1	0	1	1	8	10	5	2
*239	88	7.5	1.40	0.19	4th, 29th	16	2	0	1	2	14	5	1	2	0	0	8	7	5	6	1
*230	91	6.8	1.00	0.26	4th	12	1	0	0	4	11	0	6	2	1	3	5	4	6	3	0
*263	94	5.2	1.46	0.19	29th	17	2	0	0	6	3	4	2	2	1	4	5	5	6	5	0
*245	91	6.4	1.90	0.27	18th	18	1	2	0	3	6	3	2	2	1	5	2	4	5	9	0
*229	94	6.8	1.15	0.43	30th	13	2	0	0	9	19	0	8	0	3	1	7	5	3	1	2
*222	92	8.2	1.23	0.37	30th	13	2	0	0	2	21	27	2	1	3	4	5	3	7	4	1
*223	91	6.0	1.73	0.64	30th	13	3	0	0	9	13	1	3	4	2	3	6	4	3	3	2
*232	90	6.9	1.30	0.45	30th	10	1	0	0	7	17	2	3	2	4	3	5	3	3	5	2
*233	88	6.1	1.23	0.29	21st	8	0	0	0	5	9	0	6	2	4	4	2	3	4	4	1
*255	91	6.3	1.15	0.29	2nd	10	0	0	0	5	5	4	5	4	6	2	3	2	3	5	0
*249	91	5.2	2.75	1.00	8th	14	1	0	0	12	13	5	4	4	2	1	4	3	5	3	4
*213	94	7.1	3.57	0.64	4th	18	2	0	0	7	18	0	4	3	4	3	3	8	3	2	0
*234	86	5.9	1.93	0.43	30th	13	1	0	0	2	9	1	6	6	1	6	2	2	3	4	0
*228	84	7.0	1.89	0.32	30th	14	1	0	0	5	14	0	6	2	2	8	2	4	4	2	0
*265	86	7.0	3.51	0.49	6th	18	1	3	0	3	11	9	4	5	1	0	7	5	4	4	0
*267	84	7.3	2.62	0.62	30th	16	0	0	0	3	13	5	4	6	4	2	4	3	3	4	0
*264	89	6.1	1.45	0.43	2nd	11	0	0	0	8	10	1	5	3	3	3	5	3	3	5	0
*257	90	6.7	3.07	0.70	6th	18	1	0	0	1	10	7	3	1	3	2	4	5	7	5	0
*257	87	6.9	3.93	0.61	11th	22	1	3	0	6	11	7	4	2	1	3	5	7	3	5	0
*209	90	6.1	2.74	0.87	1st	15	0	0	0	8	15	0	0	0	1	0	8	3	3	2	13
*271	91	6.7	5.00	1.40	11th	19	0	0	0	7	13	5	5	4	0	4	1	2	3	6	5
*264	89	5.1	3.12	1.25	6th	14	0	0	0	11	9	4	8	4	2	1	3	4	4	4	0
*294	83	8.4	2.54	0.77	5th	22	0	0	0	1	17	4	5	3	5	3	4	4	1	5	0
*260	85	6.1	2.52	0.48	27th	14	0	3	0	7	11	1	3	8	4	1	5	3	2	4	0

barometrical observations at this Station are not reduced for altitude.

TABLE XXII.

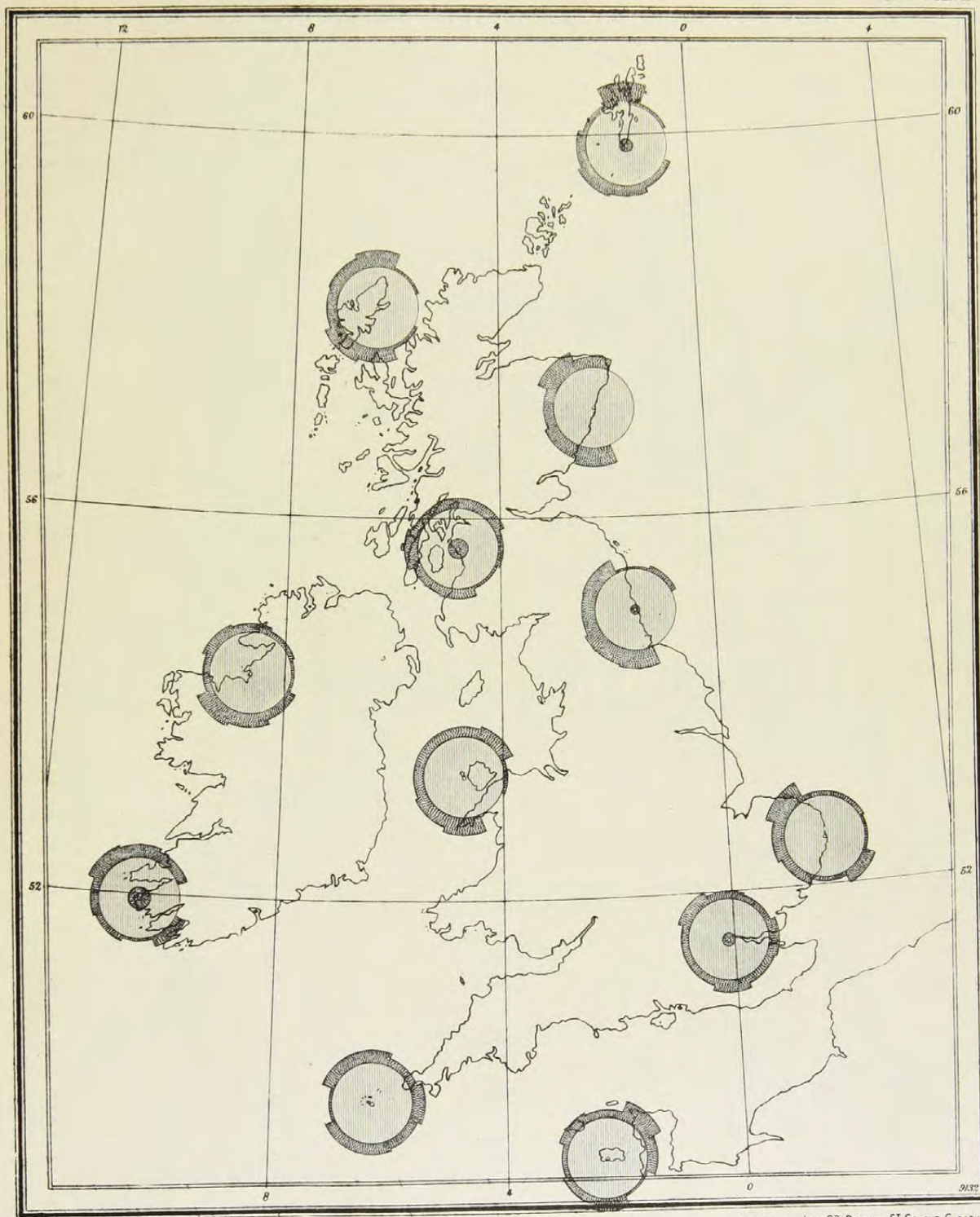
OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of November 1884.

STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per-centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Mini-mum.	Date.	Maxi-mum.	Date.			
STORNOWAY - -	*	*	*	*	*	*	*	*	55	24
ABERDEEN - -	*	*	*	*	*	*	*	*	47	20
ALNWICK CASTLE - -	36°6	45°9	41°3	19	29th	59	1st	2°27	—	—
SCARBOROUGH - -	39°6	47°3	43°5	27	30th	57	1st, 7th	2°19	—	—
YORK - - -	*	*	*	*	*	*	*	*	34	14
HILLINGTON - -	35°0	46°3	40°7	22	24th	59	7th	2°12	41	16
GELDESTON - -	37°4	47°2	42°3	24	30th	59	5th, 7th	1°77	51	20
CAMBRIDGE - -	*	*	*	*	*	*	*	*	41	16
ROTHAMSTED - -	35°2	46°4	40°8	24	25th	59	2nd, 5th	1°98	—	—
BAWTRY - - -	35°5	47°3	41°4	24	29th	60	1st	0°94	—	—
LEICESTER - -	36°5	47°2	41°9	24	30th	60	2nd	1°54	29	11
CHEADLE - - -	35°4	45°0	40°2	25	30th	56	7th	1°85	—	—
CHURCHSTOKE - -	34°6	46°9	40°8	22	30th	57	7th	1°54	41	16
HEREFORD - - -	35°8	48°1	42°0	23	30th	60	1st	1°50	—	—
CIRENCESTER - -	35°6	45°8	40°7	23	30th	57	5th	1°87	39	15
OXFORD - - -	*	*	*	*	*	*	*	*	40	16
LONDON - - -	*	*	*	*	*	*	*	*	25	10
MARLBOROUGH - -	34°5	46°1	40°3	21	30th	57	2nd, 5th	1°94	30	11
STRATHFIELD TURGISS -	34°7	48°1	41°4	21	24th	61	5th	1°49	—	—
HASTINGS - - -	40°5	48°5	44°5	28	30th	59	5th, 6th, 7th	1°20	65	25
SOUTHAMPTON - -	37°7	49°0	43°4	25	30th	62	2nd	1°54	45	17
LAUDALE - - -	37°3	47°4	42°4	27	29th	55	1st, 11th	11°38	—	—
GLASGOW - - -	36°1	45°4	40°8	26	30th	55	1st, 7th	3°29	33	14
SILLOTH - - -	36°0	46°7	41°4	23	30th	58	7th	1°72	57	23
DOUGLAS - - -	38°8	48°3	43°6	28	29th, 30th	56	1st	4°38	61	24
NEWTON REIGNY - -	34°3	45°1	39°7	22	30th	57	7th	2°36	47	19
STONYHURST - -	36°0	48°7	42°4	24	30th	58	1st	1°48	60	24
BLACKPOOL - -	36°6	47°4	42°0	23	30th	59	1st	1°89	35	14
MANCHESTER - -	36°0	46°5	41°3	25	29th, 30th	58	1st, 7th	1°84	—	—
LLANDUDNO - -	40°9	49°7	45°3	29	30th	61	1st	2°23	43	17
PEMBROKE - - -	*	*	*	*	*	*	*	*	47	18
ARLINGTON - - -	38°1	48°1	43°1	25	30th	57	6th	3°31	—	—
CULLOMPTON - -	37°4	49°1	43°3	21	30th	59	1st	2°15	26	10
FALMOUTH - - -	44°0	51°0	47°5	36	18th, 22nd, 25th, 30th	59	10th	2°61	45	17
PLYMOUTH - - -	40°4	51°0	45°7	30	30th	59	5th	1°68	42	16
JERSEY - - -	*	*	*	*	*	*	*	*	86	32
LONDONDERRY - -	36°7	48°2	42°5	29	14th, 18th	56	12th	5°07	—	—
MARKREE CASTLE - -	33°8	47°0	40°4	24	14th, 18th, 25th	54	11th, 12th	4°43	56	22
BROOKEBOROUGH - -	33°4	47°1	40°3	22	19th	54	1st, 7th	3°61	—	—
ARMAGH - - -	36°7	46°9	41°8	29	14th, 19th	57	1st	2°38	48	19
DUBLIN - - -	39°1	48°6	43°9	31	16th	59	1st	1°41	58	23
PARSONSTOWN - -	*	*	*	*	*	*	*	*	60	24
VALENCIA - - -	*	*	*	*	*	*	*	*	72	28
FOYNES - - -	35°9	49°1	42°5	27	21st 24th	56	7th	2°73	—	—

* For information see Table XXI.

MONTHLY WIND CHART FOR NOVEMBER 1884.

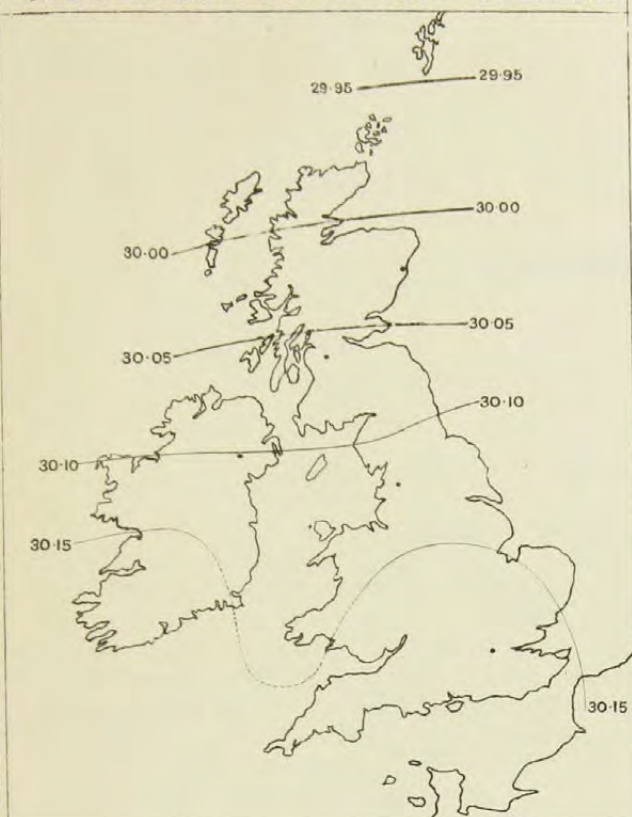
Plate XVII.



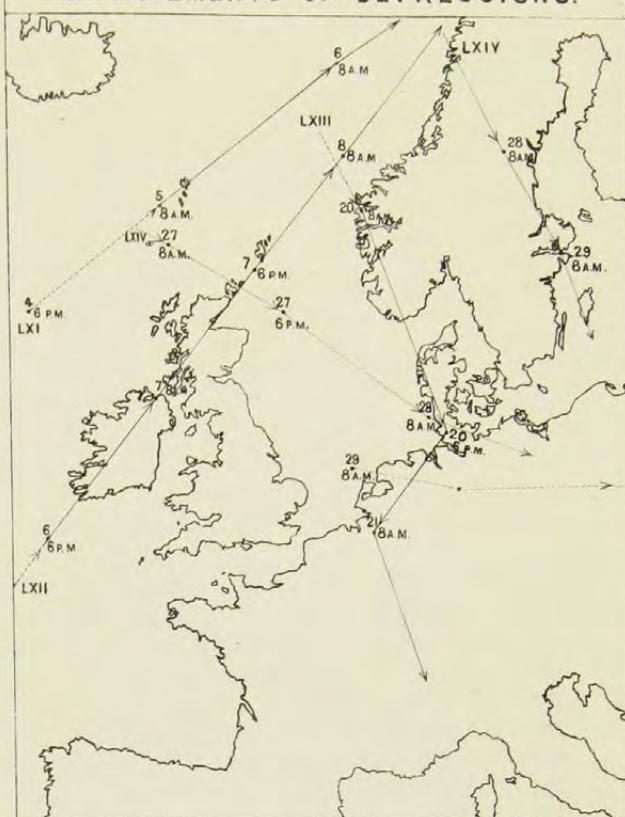
To face p. 118.

DANGERFIELD LITH 22 BEDFORD ST COVENT GARDEN.

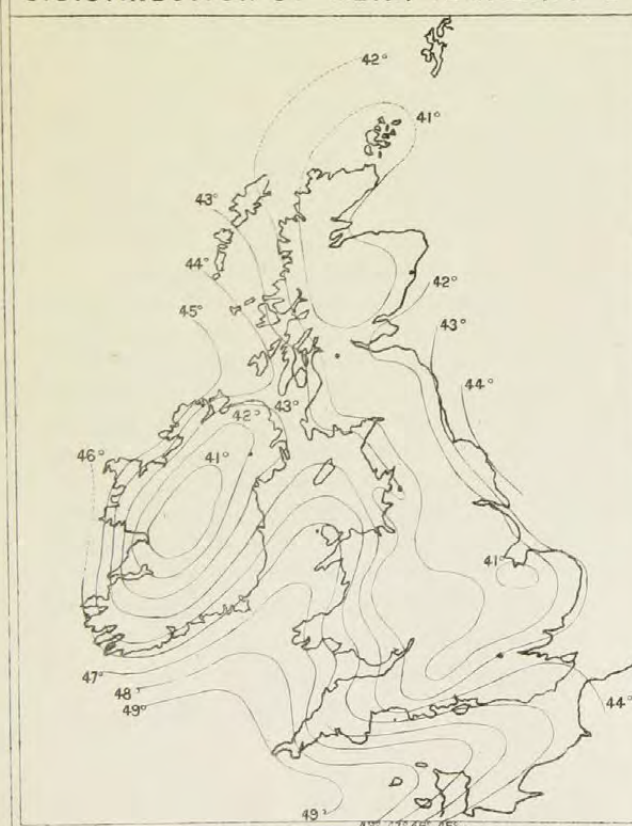
1. DISTRIBUTION OF MEAN PRESSURE



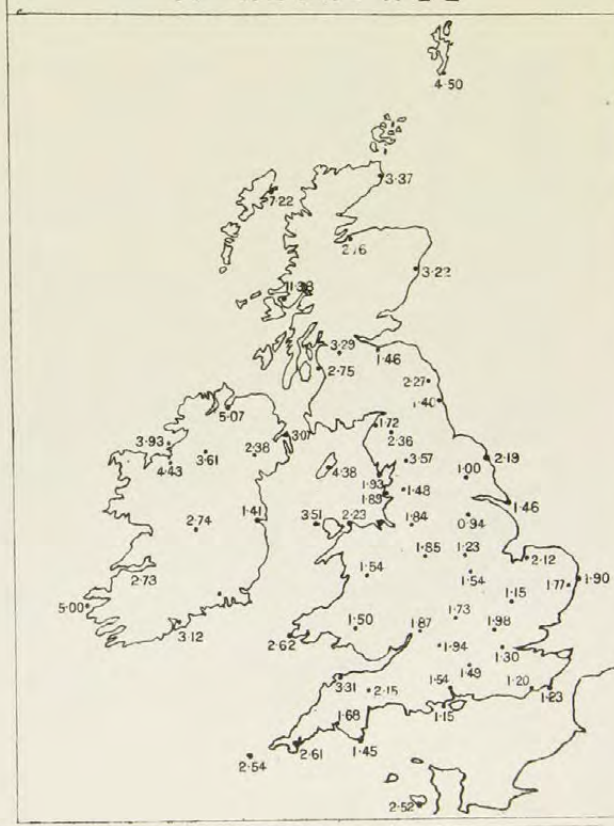
2. MOVEMENTS OF DEPRESSIONS.



3. DISTRIBUTION OF MEAN TEMPERATURE.



4. RAINFALL



MONTHLY WEATHER REPORT.

DECEMBER 1884.

SECTION I.

GENERAL SUMMARY FOR THE MONTH.

THE weather of December consisted of two distinct parts. The first was cyclonic in character, and south-westerly to westerly in type. It lasted from the 1st to the 20th of the month, and was marked by a continuous succession of depressions, which brought Southerly to Westerly, and occasionally North-westerly, gales and strong winds to our coasts, accompanied by rather high temperatures, a good deal of rain, and in many cases thunder and lightning. The barometer sometimes fell to considerably below 29 inches, and the range of pressure during the month was consequently large. The second portion was anticyclonic, and while gradients for Easterly and North-easterly winds prevailed in the south, those in the north were still favourable for winds from a South-westerly or Westerly point. Temperature was rather low, the air dry, and over the southern and eastern parts of England there hung almost constantly a dense stratum of cloud, which, with the hazy condition of the air, made the weather over those districts very dull and gloomy.

December 1-20.—The weather during this lengthy period was almost continuously cyclonic, and its type south-westerly or westerly. At times a well-marked anticyclonic "ridge" extended over the country, between a receding and an advancing depression, producing passing periods of cold, with some fog, but such occurrences were rare. The thermometer, as a rule, was somewhat above its average height, the air was damp, while rainfall was of frequent occurrence, and, at our northern and north-western stations, heavy.

The anticyclonic period prevalent during the latter part of November gave way at its close, and the morning of December 1st found us with a shallow depression (No. LXV.*) lying over the western parts of the kingdom, to which region it had advanced from the north-north-westward during the previous night. For a time North-westerly and Northerly winds prevailed in Ireland simultaneously with South-easterly and Southerly breezes at our eastern stations, and a considerable fall of sleet and cold rain occurred, accompanied by a rise of temperature. The disturbance, however, soon broke up and the cyclonic systems LXVI.* to LXVIIA.* advanced quickly over our area, followed by another on the 6th, the track of which is indicated approximately on Map 2 by the line "A," its centre passing at too great a distance from our coasts for its characteristics to be tabulated in Section II. The weather during this period consisted, therefore, of alternations of gales (chiefly South-westerly) and moderate breezes, and of showers and fair weather. Temperature was rather high for

* See Section II. and Map 2 Plate XXV. for the history and tracks of depressions.

the time of year, but its daily range was not large. Thunder and lightning occurred in many places on the 4th and 5th, and iridescent clouds were observed at Stornoway on the morning of the 6th.

The weather then improved slightly for a day or two, for although the general type of pressure distribution was unchanged, the depressions observed passed so far outside our most northern coasts, (in about the direction of the broken arrow marked "A" on Map 2, Plate XXV.) that their effects on the weather over the United Kingdom were not so great as those of the disturbances just referred to. Showers of rain and squally South-westerly winds were, nevertheless, still experienced, and occasionally reached the force of a gale at our outlying western and north-western stations. On December the 9th, however, a shallow, but remarkable, depression (No. LXVIII.*) appeared over the north of France, and moving rapidly to the eastward, grew much deeper and produced strong South-west to North-west gales at many of the continental stations. Over the British Islands the only material effects observed were (1) a temporary shift of the wind to North-east and North-west over our southern counties, (2) a decided increase in the strength of the wind from North-west over St. George's Channel, and (3) a considerable fall of cold rain over the southern parts of England, and sleet in the extreme south-east.

The passage of large and deep depressions over the northern parts of our area was then renewed, but their movements were more easterly than those noticed earlier in the month. The weather consequently became less settled, and iridescent clouds were again observed in Scotland on the evening of the 11th. In the rear of these depressions the barometer rose very decidedly, a well-formed ridge occasionally extending far to the Northward from the French anticyclone, causing the wind to veer well to the North-westward, and at times producing lower thermometric readings, and larger variations of temperature, than had hitherto been observed. (See particularly the maps in the Daily and Weekly Weather Reports for the 12th and 17th.) Showers of sleet, also, were mingled from time to time with those of rain, and thunder and lightning were frequently reported.

On the 19th a still more decided change took place. Pressure was then highest over Spain and lowest to the northward of the United Kingdom, when a well-formed and apparently deep depression (No. LXXI.*) approached the Hebrides from the westward. This subsequently travelled quickly in a south-easterly direction, and reached the Danish coast early on the 20th. It was succeeded immediately by an equally well-marked disturbance the centre of which lay well to the westward of Mayo at 6 p.m. on the 19th, but travelled so quickly that at 8 a.m. on the 20th it lay off the Norfolk coast. The weather brought by these two systems was very wild and rough, gales of wind varying in direction from South, round by West, to North, being experienced in most places accompanied by thunderstorms, rain, and sleet in several places. In their rear the barometer rose with great rapidity, and the long period of cyclonic westerly winds and weather came to an end.

December 21.—The weather over the United Kingdom on this day was transitional from the cyclonic to the anticyclonic system referred to above; the winds over our Islands were chiefly Northerly, moderate to light in most places, but rather strong in the east. Temperature fell decidedly, the air became dry, and the sky cleared. In the east of France, however, Northerly gales, cold rains, and snow were felt in the rear of the depression (No. LXXIA.*) as it passed away towards the Adriatic.

December 22-30.—This period was, with the exception of a brief interruption on 24th-25th, purely anticyclonic. The system was fully developed over the British Islands and their neighbourhood early on the 22nd, and took the form of a long band (or crest) of high pressure stretching completely across the United Kingdom, the North Sea, the north of

* See Section II. and Map 2, Plate XXV., for the history and tracks of depressions.

Denmark, and the southern parts of Scandinavia. Within its central area the winds were light and variable, temperature was very low, and the weather foggy. To the northward South-westerly and Westerly winds were reported, with relatively high temperatures and fair weather, while at our southern stations the winds were North-easterly, cold and dry, and the sky was covered with a dense sheet of anticyclonic stratus, through which the sun hardly ever shone. The days were consequently dark and gloomy, especially in the large towns. Towards the end of the month, however, the anticyclone began to give way near its western extremity. On the 28th a depression appeared over the southern parts of the Bay of Biscay and north of Spain, but this dispersed *in situ*. The barometer, however, fell steadily, and at the close of the month moderate gradients for Southerly winds had been formed over the whole of north-western Europe.

SECTION II. - - - - -

TABLE OF CYCLONIC SYSTEMS.—DECEMBER, 1884.

NATURE OF CHARACTERISTICS OBSERVED.	No. LXV. December 1.	No. LXVI. December 2.	No. LXVII. December 3-5.
Form - - - -	Irregular oval - - - -	Apparently nearly circular - -	Nearly circular - - - -
Size - - - -	Small - - - -	Large - - - -	Large - - - -
Depth - - - -	Very shallow; gradients slight -	Moderate; gradients steepest on its eastern side.	Moderate; gradients not very steep -
Where first Observed - -	To the northward of Ireland - -	To the north-westward of the Hebrides.	Off the west of Ireland - - - -
Direction of Motion - -	South-easterly till morning of 1st, then irregular and very slight, till the system dispersed.	North-easterly - - - -	North-easterly till evening of 3rd, then northerly.
Rate of Motion - - - -	Rapid at first, then very slow - -	Apparently moderate - - - -	Rapid at first, then slow, to very slow
Regions passed over by Steepest Gradients.	England and Ireland - - - -	Scotland and the north of Ireland -	Ireland, England, and north of France.
Termination - - - -	Dispersed over Gloucestershire -	Travelled away to the north-eastward	Dispersed off west of Norway on 5th -
Time under Observation -	Nearly one day - - - -	One day - - - -	Two days - - - -
Accompanying Winds - -	South-easterly to South-westerly in the east, Northerly to the westward of its track.	Southerly, strong to a gale in the north, then Westerly and more moderate.	South to West and North-west, strong. A gale at some north-western stations and at mouth of Tyne as well as in the Channel.
Weather - - - -	Unsettled; snow and sleet showers. Warmer over England, colder in Ireland.	Showery, squally, unsettled - -	Squally, rainy, unsettled - - -
Rainfall - - - -	Rather heavy over the greater part of England and Wales, slight in Ireland.	General, but not heavy - - - -	General; heavy at some northern stations.
REMARKS - - - -	<p>This depression appeared in the extreme north-west as the anti-cyclone No. XXV. was moving southwards and dispersing. (See the November Report.) Its direction of motion was unusual, and its dispersion over England was probably brought about by the immediate advance of depression No. LXVI. to our north-western coasts. See Weekly Weather Report, 1884, pp. 191 and 194.</p> <p>This depression appeared to the north-westward of a "col" which lay over Norway and Denmark, uniting a high-pressure area over northern Europe with another lying over France and western Germany. It completely dispersed the system No. LXV. as it advanced, but soon passed out of our area. Simultaneously with its appearance in the north-west, another depression, which was formed over central Russia on the 1st, moved north-westwards to the Baltic, and its north-western side lay over the south-east of Sweden at 8 a.m. 2nd. (See charts in Daily and Weekly Weather Reports for these dates.)</p> <p>This depression followed closely in the rear of No. LXVI., but its track lay further to the south-eastward than that of its predecessor. The cyclonic circulation of wind was therefore more completely exhibited than with No. LXVI. As it travelled north-eastwards the depression noticed over the Baltic on the 2nd dispersed. A well marked subsidiary disturbance soon advanced over us. (See system LXVIII.)</p>		

SECTION II.

TABLE OF CYCLONIC SYSTEMS.—DECEMBER, 1884.

No. LXVIIA. December 4-5.	No. LXVIII. December 9.	No. LXIX. December 10-11.	No. LXX. December 14-16.
Variable; central area nearly circular	Varying; apparently elongated at first.	Varying; apparently oval at first	Varying; apparently nearly circular at first.
Moderate - - - -	Small - - - -	Very large - - - -	Large.
Moderate to deep - - -	Very shallow at first, but grew deeper after passing out of our area.	Deep - - - -	Deep.
Over the Irish Sea - - -	Over Brittany - - - -	To the north-westward of Ireland -	To the north-westward of the Hebrides.
North-easterly till morning of 5th, then more easterly.	East-north-easterly and easterly	North-easterly at first, then easterly and east-south-easterly.	North-easterly at first, then nearly northerly.
Rapid - - - -	Rapid - - - -	Moderate - - - -	Moderate.
Western and southern parts of our Islands, the Channel, north of France, and Holland.	France, Germany, and Austria. Gradients slight while within our area.	British Islands and North Sea, especially over our north-western coasts.	British Islands (especially Scotland) and Norway.
Dispersed over the Baltic during the 6th.	Travelled away over Austria - -	Travelled away over northern Russia	Travelled away to the northward.
One day within our area - -	Less than a day within our area -	About 36 hours - - - -	Two days.
South-east to South-west and North-west; fresh, to a strong gale.	Southerly to Westerly and North-westerly gales over France and Germany. North-easterly airs and North-westerly breezes on our southern coasts.	Southerly and South-westerly gales, veering to West and North-west, and moderating.	Southerly to Westerly gales in our Islands. South-easterly winds in the west of Norway.
Very unsettled, squally, and showery. Thunder and lightning in many places.	Cold rain over the southern parts of England, and some sleet. Great fall of temperature.	Very unsettled and showery. Temperature high for time of year.	Rough, squally and rainy, but mild.
General, except in north, and rather heavy in the south-west and south.	Moderate over our Islands, heavy on the Continent.	General, but not heavy	General; heavy over the Skager Rack and in Sweden.
This depression moved very rapidly at first. Its track across our Islands lay about 100 miles to the south-eastward of that of No. LXVII., but on reaching the eastern shores of the North Sea it became an independent system (the primary having dispersed), but its movement slackened and it soon broke up. In its rear pressure became high over the southern parts of the Bay of Biscay and France, and also over northern Europe, a well-marked "hollow" separating the two.	This disturbance appeared of little importance when it first reached Brittany, but subsequently grew, and on reaching Germany developed some subsidiary disturbances, which are reported to have wrought great mischief in some parts of Austria. Even over France the gales reported were singularly in excess of what might have been expected for the gradients. See Weekly Weather Report, 1884, p. 198.	This disturbance arrived when pressure was highest (30.4 ins. and upwards) over France, and lowest to the northward of our Islands and over northern Europe. The complete system was very extensive. On the morning of the 11th a rather deep subsidiary disturbance approached the south of Ireland, and, traveling south-eastwards, reached Germany by 8 a.m. 12th. It produced Westerly and North-westerly gales in France, and for a time drew the wind into North-west over England, with a considerable fall of temperature and much cold rain.	This depression was very well-defined. It approached our north-west coasts when pressure was highest (30.4 ins. and upwards) over France, and lowest to the north-westward of our Islands. As it advanced the barometer rose over Scandinavia also, and the advance of the system being thus checked, its motion changed materially.

Continued

SECTION II.—*continued.*

TABLE OF CYCLONIC SYSTEMS.—DECEMBER, 1884.

NATURE OF CHARACTERISTICS OBSERVED.		No. LXXI. December 19-20.	No. LXXIA. December 20.
Form	- - - - -	Varying; apparently nearly circular at first	Nearly circular.
Size	- - - - -	Large at first, then diminishing in area	Moderate.
Depth	- - - - -	Deep at first, then growing shallow rapidly	Deep. Minimum readings below 28°6 ins.
Where first Observed	- - - - -	To the north-westward of the Hebrides	To the westward of Ireland.
Direction of Motion	- - - - -	Easterly and south-easterly	East-south-easterly till 8 a.m. 20th, then south-south-easterly.
Rate of Motion	- - - - -	Moderate	Very rapid.
Regions passed over by Steepest Gradients	- - - - -	The northern parts of our Islands	Ireland, England, and France.
Termination	- - - - -	Dispersed near Denmark	Travelled away to northern Italy.
Time under Observation	- - - - -	About 36 hours	About 24 hours.
Accompanying Winds	- - - - -	South-westerly to Westerly gales and strong winds in our Islands; South-easterly to North-easterly winds in Norway.	South-westerly to North-westerly and Northerly gales of great strength.
„ Weather	- - - - -	Squally and wet, with lightning very generally; temperature changing suddenly.	Becoming much colder; severe squalls; rain and snow.
„ Rainfall	- - - - -	General, but not heavy	General, but slight as a rule.
REMARKS	- - - - -	<p>This depression advanced when pressure was high both over south-western and northern Europe.</p> <p>On reaching the northern parts of the North Sea, it was joined by No. LXXIA., the effect of which was to break up the circulation of wind round the present depression and cause the whole system to disperse.</p>	
		<p>This depression moved at first as though subsidiary to the previous one, but (as occurred on 12th March 1876) the subsidiary dispersed the primary and proceeded in an entirely independent direction.</p> <p>In its rear the barometer rose generally and very rapidly, and the weather changed entirely from a cyclonic to an anticyclonic character.</p>	

TABLE OF ANTICYCLONIC SYSTEMS.

NATURE OF CHARACTERISTICS OBSERVED.		No. XXVI. December 22-30.
Form	- - - - -	Varying; usually very elongated, the major axis lying from west-south-west to east-north-east across our Islands and the North Sea.
Size	- - - - -	Large.
Height	- - - - -	Small to moderate.
Where first Observed	- - - - -	Off the west of Ireland.
Direction of Motion	- - - - -	Easterly at first, then very variable.
Rate of Motion	- - - - -	Varying greatly; at times stationary.
Regions passed over	- - - - -	British Islands and North-western Europe generally.
Termination	- - - - -	Passed away to eastward of North Sea.
Accompanying Wind	- - - - -	Westerly (North-west to South-west) in the north, North-easterly in the south, calm between these two currents.
„ Weather	- - - - -	Fair, cold; very gloomy over England, brighter in Ireland and Scotland.
REMARKS	- - - - -	<p>This system advanced immediately in the rear of Cyclonic Systems Nos. LXXI. and LXXIA., and spread completely over North-western Europe, as a "crest" (or high-pressure band). On the 24th the system was temporarily displaced by a cyclonic system which appeared off our northern coasts, and spread southwards over the North Sea, the change was, however, very temporary. On the 26th the band was restored and remained with us till the 29th, when it began to give way at its western extremity, and finally passed eastwards out of our area.</p>

SECTION III.

REMARKS FOR DECEMBER 1884.

(Tables XXIII. and XXIV. with Plates XXIV. and XXV.)

Pressure.—The mean pressure for the month, at 8 a.m., varied from 29·93 inches at Jersey and a little above 29·91 inches on the south coasts of Devon and Cornwall to about 29·5 inches in the extreme north of Scotland and the south of the Shetlands. This distribution is favourable for the prevalence of South-westerly and Westerly winds of considerable strength, and on referring to Section I. it will be seen how constantly these winds were reported until the 20th. Compared with the average distribution of pressure for December, during the 20 years 1861–80, the values for the month now under review exhibit a deficit amounting to nearly 0·25 inch over the north of Scotland, and 0·15 inch over the north of Ireland, while over the eastern part of the Channel the deficit is only about 0·10 inch, and in the neighbourhood of the Scilly Islands only 0·04 inch. The conditions this year have, therefore, been favourable for winds from a rather more Westerly point, and of greater strength than usual. These features are attributable mainly to the conditions which prevailed between the 1st and 19th of the month, the means for which period would give a still more marked result if freed from the modifying influence of the conditions which prevailed from the 20th to the end of the month. The highest readings were recorded in nearly all parts of the kingdom on the 22nd, when the anticyclone No. XXVI. became fairly established over the kingdom. The lowest were recorded on the 19th (except in the extreme north), while depressions Nos. LXXI.* and LXXIA.* were passing over. The range was considerable—exceeding 1·5 inch in most parts of the kingdom.

Movements of Depressions.—The first depression (No. LXV.*) which appeared over our area during December moved in a very irregular manner, and dispersed on reaching the western-central parts of England. With this exception the greater number of the disturbances travelled in a north-easterly direction, the centres of most of them passing outside our extreme north-western coasts, while some of them travelled directly over the United Kingdom. Later on, however, they took a more Easterly course, and the two last which reached our area moved south-eastwards, and one of them, on reaching our east coast, passed in almost a southerly direction towards southern Europe.

Anticyclones.—The only fully-formed anticyclone which passed over our Islands in December was No. XXVI. (p. 124), which came over us from the westward on the night of the 21st. There was nothing in its behaviour worthy of very special remark.

Winds.—These were mainly South-westerly, especially at the northern stations, and were often very strong in force. Gales from this quarter were of frequent occurrence, owing to the number and intensity of the depressions which travelled over our area, to which reference is made both in Sections I. and II. At the southern stations, however, the last 10 days of the month were marked by the prevalence of winds from the north-eastward and northward, the force of which was moderate. These are clearly indicated in the wind-roses for the English stations, and still more so in that for Jersey. (See Plate XXIV.)

Temperature.—The mean (sea-level) temperature for the month varied from 47° at Scilly and about 45° at Jersey and in the south-west of Ireland, to somewhat below 39° at the inland stations in the northern parts of England and somewhat below 40° over the north of Ireland, and to somewhat below 37° over the inland parts of Scotland. These values show a decrease since November, amounting to 4° in Scotland, 3° over the northern parts of England,

* See Section II. and Map 2, Plate XXV., for the history and tracks of depressions.

and 2° over the north of Ireland and on our south-western coasts. When compared with the values for the corresponding month in the years 1861–80, it appears that during the present year over the northern parts of Great Britain the temperature of December has differed but little from its normal value; in the south of England it has been rather in excess; over the north of Ireland there has been a slight deficit, but in the south of Ireland the average values and those for the present month are almost identical. The highest readings registered were recorded on such very various dates that it is impossible to give a detailed statement which would be more readily understood than the figures given in Table XXIII. The 6th to the 8th, however, and the 13th and 14th appear to have been the warmest periods. The lowest values were registered on the 1st at most of the eastern stations, but over the kingdom generally the cold was sharpest near the close of the month (24th to 29th) during the period in which the anticyclonic band mentioned in Section I. and II. lay over us. Neither in the maximum nor the minimum readings was there anything recorded worthy of special note, except in the east of Scotland, where the minimum was locally as low as 14° . Thus, while the range was moderate as a rule, it amounted to 36° at Aberdeen.

Rainfall.—Owing to the continuous advance of depression towards our north-west coasts from the Atlantic, the rainfall at the western and north-western stations was large, while the subsidiary disturbances and the small depressions of the 9th and 12th raised the aggregate fall on our southern coasts also to more than its normal value. Over the midland and north-eastern counties, however, the fall was small. At Stornoway there were 27 rainy days, at Sumburgh Head 26, at Jersey 25, and at Valencia and Dungeness 23; in most other places the numbers vary from 16 to 22. When we remember that over the greater part of the kingdom the fall occurred almost entirely between the 1st and 22nd, it will be seen at once how very showery the first three weeks of the month must have been. The great prevalence of hail showers at Mullaghmore is worthy of special note.

Vapour Tension was lowest (0·20 inch) as a rule where the temperature was lowest, viz., over the inland parts of Scotland, Ireland, and the north of England, and highest (0·28 inch) off our south-western coasts. At Leith the value recorded is singularly low. *Relative Humidity* as a rule varied from 85 per cent. to 95 per cent., but the values are irregularly distributed. The percentage for Ardrossan (94) appears to be too high, and that for Leith (73) too low.

Bright Sunshine.—This was singularly deficient everywhere. Assuming that the total possible duration for the month at each station would be represented by 100, the values recorded were only 1 at Glasgow, 3 at York, Collumpton, and in London, and so on, increasing to 10 at Churchstoke, Southampton, and Jersey, 12 at Aberdeen and Pembroke, 14 at Dublin, and 16 at Douglas (Isle of Man). The month was therefore very dull.

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS

MADE AT

TELEGRAPHIC REPORTING STATIONS IN THE BRITISH ISLANDS

DURING THE MONTH OF DECEMBER, 1884.

TABLE XXIII. -

Giving a SUMMARY of the METEOROLOGICAL OBSERVATIONS made at TELEGRAPHIC
Observations are made at 8 a.m. daily, but the Numbers of Days of Rain, Snow, Hail
(The Stations are grouped in Districts, and then arranged in order of Latitude,

NAMES OF DISTRICTS.	NAMES OF STATIONS.	Mean Height of Barometer (at 32° Fahrenheit and Mean Sea Level) from Observations made at 8 a.m.	AIR TEMPERATURE.							
			At 8 a.m.	Means of			Absolute Extremes.			
				Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.
0. SCOTLAND, N.	Sumburgh Head - - -	ins. 29° 457	40° 5	35° 5	43° 8	39° 7	31	17th, 22nd, 25th, 26th, 22nd	48	14th
	Wick - - - - -	29° 530	37° 6	33° 6	41° 5	37° 6	29		49	13th
	Stornoway - - -	29° 493	40° 6	35° 3	44° 1	39° 7	28	17th	51	13th
1. SCOTLAND, E.	Nairn - - - - -	29° 555	36° 3	32° 1	41° 9	37° 0	22	1st	53	13th, 14th
	Aberdeen - - -	29° 613	36° 3	31° 5	41° 5	36° 5	14	1st	50	13th
	Leith - - - - -	29° 646	38° 9	33° 5	43° 5	38° 5	22	23rd	55	13th, 14th
2. ENGLAND, N.E.	Shields - - - -	29° 715	39° 4	34° 7	44° 2	39° 5	26	1st	54	12th, 13th, 14th
	York - - - - -	29° 789	38° 2	34° 0	44° 1	39° 1	25	1st, 28th	55	13th, 14th
	Spurn Head - - -	29° 766	40° 1	36° 3	43° 6	40° 0	30	1st, 19th	52	13th, 14th
3. ENGLAND, E.	Yarmouth - - -	29° 817	40° 8	35° 7	44° 1	39° 9	25	1st	54	6th, 7th
	Cambridge - - -	29° 846	39° 3	34° 0	44° 6	39° 3	23	31st	56	6th
4. MIDLAND COUNTIES	Loughborough - -	29° 824	39° 0	35° 8	43° 8	39° 8	25	1st, 31st	54	6th, 13th
	Oxford - - - - -	29° 866	39° 9	36° 5	44° 6	40° 6	23	31st	55	6th, 7th
5. ENGLAND, S.	London - - - - -	29° 865	40° 8	37° 0	45° 9	41° 5	29	1st, 31st	55	3rd, 6th, 7th, 13th.
	Dungeness - - -	29° 866	42° 1	39° 6	47° 0	42° 3	29	1st	54	7th, 8th
	Hurst Castle - - -	29° 891	43° 0	38° 9	48° 4	45° 7	27	1st	55	3rd
6. SCOTLAND, W.	Ardrossan - - -	29° 670	40° 5	35° 4	45° 0	40° 2	27	22nd, 23rd, 29th	50	3rd, 12th, 13th, 14th.
7. ENGLAND N.W.	Hawes Junction* - -	28° 503	34° 5	30° 1	38° 6	34° 4	21	24th	48	13th, 14th
	Barrow-in-Furness -	29° 757	40° 0	36° 9	43° 4	40° 2	29	24th, 25th	50	2nd, 5th, 7th, 10th, 12th, 13th, 14th.
	Liverpool (Bidston) -	29° 791	39° 7	36° 6	44° 5	40° 6	28	27th, 28th	55	6th, 13th
	Holyhead - - - -	29° 791	43° 4	39° 8	46° 8	43° 3	30	28th	53	2nd, 7th
8. ENGLAND, S.W.	Pembroke - - - -	29° 836	44° 6	40° 9	47° 5	44° 2	32	24th, 27th, 28th	54	2nd
	Prawle Point - - -	26° 914	43° 2	38° 3	47° 0	42° 7	30	25th	54	2nd, 3rd
9. IRELAND, N.	Donaghadee - - -	29° 717	40° 2	35° 1	45° 1	40° 1	28	22nd	54	6th
	Mullaghmore - - -	29° 706	43° 2	38° 8	46° 9	42° 9	31	28th	55	13th
10. IRELAND, S.	Parsonstown - - -	29° 809	39° 1	33° 9	45° 0	39° 5	22	24th	55	13th
	Valencia - - - -	29° 854	45° 0	39° 9	50° 4	45° 2	32	24th, 27th, 28th	57	2nd
	Roche's Point - - -	29° 853	43° 6	38° 9	49° 1	44° 0	31	24th	55	7th, 13th
CHANNEL ISLANDS	Scilly (St. Mary's) -	29° 913	48° 0	43° 6	50° 2	46° 9	35	27th, 28th	55	7th
	Jersey (Noirmont) -	29° 928	44° 7	41° 3	47° 4	44° 4	33	29th, 30th	54	2nd, 3rd, 7th

* Hawes Junction is 1,135 feet above Mean Sea Level and the

- TABLE XXIII.

REPORTING STATIONS in the BRITISH ISLANDS, during the Month of December 1884.

Thunderstorms, and Gales are counted irrespective of the hours at which they occurred.

beginning in each case with the Station lying furthest North.)

TENSION OF VAPOUR.	RELATIVE HUMIDITY.	AMOUNT OF CLOUD.	RAINFALL.			WEATHER, No. of Days of							WIND, No. of Observations of								
			Total Fall in the Month.	Maximum Fall in One Day.	Date.	Rain.	Snow.	Hail.	Thunderstorms.	Clear Sky.	Overcast.	Gales.	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calm.
ins. 0.209	% 84	8.4	ins. 6.71	ins. 1.45	3rd	26	0	0	0	2	20	5	3	1	0	3	5	6	9	4	0
198	88	5.3	1.97	0.48	13th	17	1	0	0	7	6	8	1	0	0	0	10	6	6	6	2
232	92	7.4	5.66	0.63	10th	27	2	7	2	5	19	11	1	1	0	0	9	10	5	5	0
192	90	5.5	2.60	0.45	13th	16	2	1	0	10	11	1	0	0	1	1	3	10	5	2	9
186	87	4.9	1.84	0.50	2nd	17	5	3	0	12	9	3	2	0	0	1	7	13	6	2	0
170	73	6.5	2.95	0.47	16th	17	2	1	0	6	8	2	0	0	1	3	1	5	15	6	0
208	87	6.4	1.47	0.33	4th	17	2	1	0	7	12	7	1	0	0	2	6	17	1	3	1
204	89	6.7	1.52	0.32	19th	18	0	0	0	7	14	0	7	1	4	3	4	4	8	0	0
231	93	5.8	1.90	0.32	19th	19	3	0	0	5	6	4	3	1	3	3	3	11	4	2	1
229	91	6.7	2.36	0.36	19th	19	1	0	0	3	9	7	2	4	4	1	3	7	7	3	0
215	90	7.5	1.68	0.38	7th	19	1	0	0	4	18	0	5	2	2	2	2	13	3	1	1
210	89	8.3	2.01	0.38	18th	19	3	1	1	0	20	16	4	1	4	2	1	10	6	3	0
218	89	7.9	2.08	0.36	5th	18	2	0	0	6	21	2	3	5	2	2	2	12	3	2	0
219	87	6.9	2.32	0.42	5th	18	3	0	0	7	18	7	4	3	3	2	3	9	6	1	0
242	90	7.6	3.58	0.80	11th	23	2	0	0	3	15	7	3	3	4	1	1	4	10	5	0
251	90	6.2	3.39	0.49	6th	18	0	1	0	6	9	9	3	5	4	0	1	5	10	3	0
237	94	7.9	4.55	0.51	2nd	21	3	1	1	5	23	10	2	2	6	0	3	8	6	2	2
180	90	7.5	10.11	1.69	10th	19	5	0	0	3	18	3	4	2	2	5	1	8	7	1	1
211	86	8.5	3.83	0.42	2nd	20	0	2	0	1	21	5	5	5	0	5	3	8	3	2	0
199	81	6.2	2.73	0.46	14th	18	2	1	0	8	13	3	3	2	3	3	4	8	7	1	0
236	83	7.5	3.59	0.58	14th	17	0	0	0	1	13	6	1	3	3	3	3	8	8	2	0
237	80	6.3	3.47	0.58	5th	22	0	0	0	3	7	10	1	5	4	1	1	8	8	3	0
249	89	7.3	5.23	0.77	3rd	20	0	2	0	3	15	9	2	6	1	1	1	9	6	4	1
232	93	5.2	3.35	0.44	1st	20	1	0	0	8	3	7	2	1	0	0	4	11	9	4	0
238	85	7.4	4.75	0.50	16th	22	3	11	2	3	10	14	1	0	0	4	3	9	9	5	0
213	89	7.3	4.14	0.38	7th	22	0	0	0	5	17	0	1	0	0	1	3	4	13	2	7
268	90	7.6	5.68	0.60	3rd	23	0	1	0	3	17	10	2	3	0	3	3	5	9	4	2
250	88	6.3	5.33	0.60	3rd, 7th	21	1	1	1	5	11	7	6	1	1	1	1	10	5	0	0
287	87	8.5	2.64	0.36	3rd	22	0	1	0	0	16	9	2	3	3	2	1	9	6	5	0
264	90	8.0	5.71	0.79	8th	25	0	8	0	0	16	10	2	6	3	1	0	7	8	3	1

Barometric readings are not corrected for altitude.

TABLE XXIV.

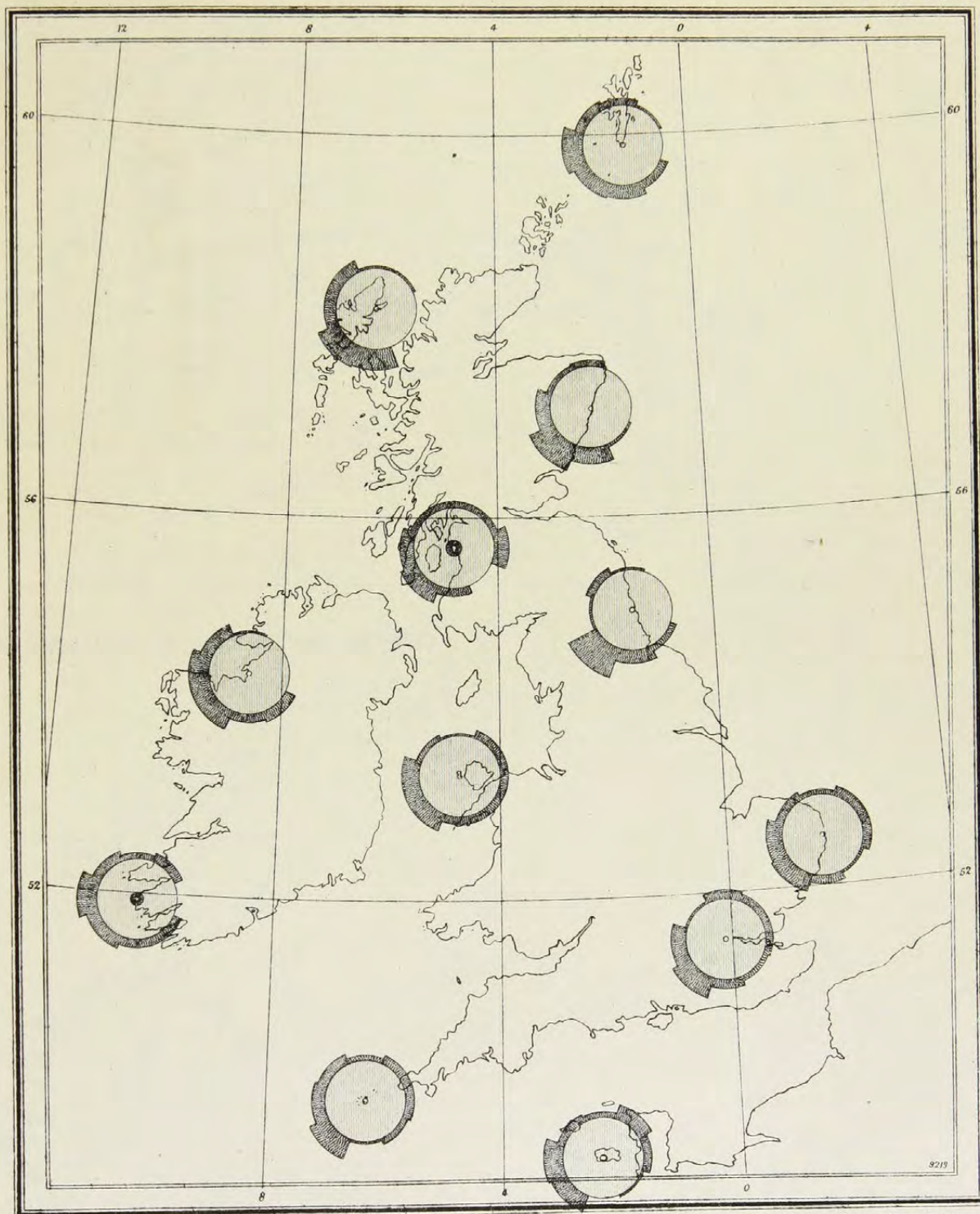
OBSERVATIONS of TEMPERATURE, RAINFALL, and BRIGHT SUNSHINE, obtained from the VALUES supplied for use in the WEEKLY WEATHER REPORT during the Month of December 1884.

STATIONS.	AIR TEMPERATURE.							RAINFALL.	BRIGHT SUNSHINE.	
	Means of			Absolute Extremes.				Amount in Inches.	No. of Hours recorded.	Per-centage of possible Duration.
	Minima.	Maxima.	Min. and Max. combined.	Minimum.	Date.	Maximum.	Date.			
STORNOWAY - -	°	°	°	°	*	°	*	*	6	3
ABERDEEN - -	*	*	*	*	*	*	*	*	24	12
ALNWICK CASTLE -	34°6	42°0	38°3	26	25th	52	13th, 14th	2°50	—	—
SCARBOROUGH - -	36°3	43°5	39°9	29	27th	53	13th, 14th	2°05	—	—
YORK - - -	*	*	*	*	*	*	*	*	6	3
HILLINGTON - -	34°6	43°6	39°1	26	30th, 31st	54	6th	2°61	14	6
GELDESTON - -	36°4	44°6	40°5	25	31st	55	6th, 8th	2°16	23	10
CAMBRIDGE - -	*	*	*	*	*	*	*	*	24	10
ROTHAMSTED - -	35°5	44°0	39°8	25	31st	54	3rd, 6th, 7th, 8th, 13th.	3°06	—	—
BAWTRY - - -	33°7	43°6	38°7	24	30th	57	13th	1°35	—	—
LEICESTER - -	35°0	43°6	39°3	23	1st	54	6th, 7th, 14th	2°40	9	4
CHEADLE - - -	33°6	41°8	37°7	26	27th, 31st	53	13th	2°92	—	—
CHURCHSTOKE - -	34°5	43°5	39°0	28	24th, 26th, 27th	56	13th	3°37	23	10
HEREFORD - -	35°8	44°9	40°4	29	1st, 25th	58	13th	1°96	—	—
CIRENCESTER - -	34°8	44°1	39°5	23	31st	53	14th	3°69	13	6
OXFORD - - -	*	*	*	*	*	*	*	*	24	10
LONDON - - -	*	*	*	*	*	*	*	*	8	3
MARLBOROUGH - -	34°8	43°7	39°3	28	26th, 30th, 31st	53	7th, 8th, 13th	3°11	19	8
STRATHFIELD TURGIS -	35°3	45°6	40°5	21	31st	55	3rd, 8th, 13th	2°27	—	—
HASTINGS - - -	38°3	46°0	42°2	31	18th	54	7th, 8th	4°24	27	11
SOUTHAMPTON - -	37°4	46°6	42°0	30	31st	56	3rd	3°72	23	10
LAUDALE - - -	36°4	44°3	40°4	27	1st	53	12th	12°95	—	—
GLASGOW - - -	33°6	42°1	37°9	25	22nd	53	14th	5°43	3	1
SILLOTH - - -	34°2	42°4	38°3	22	26th	51	14th	4°33	24	11
DOUGLAS - - -	37°9	45°0	41°5	26	26th	53	12th, 13th	5°45	35	16
NEWTON REIGNY - -	32°6	40°6	36°6	19	26th	52	13th	4°72	23	11
STONYHURST - -	34°6	45°0	39°8	27	29th	52	4th, 14th	6°40	21	9
BLACKPOOL - -	35°3	43°1	39°2	26	23rd, 25th, 29th	53	13th	3°99	11	5
MANCHESTER - -	34°5	42°6	38°6	25	27th	54	14th	4°72	—	—
LLANDUDNO - -	38°0	45°8	41°9	27	29th	55	14th	2°92	?	?
PEMBROKE - - -	*	*	*	*	*	*	*	*	29	12
ARLINGTON - - -	35°9	44°7	40°3	26	29th	53	7th	8°75	—	—
CULLOMPTON - -	36°7	46°4	41°6	27	1st	56	3rd, 7th	4°30	7	3
FALMOUTH - - -	41°3	48°1	44°7	32	27th	54	3rd, 6th, 7th, 8th, 13th.	5°10	27	11
PLYMOUTH - - -	39°0	48°1	43°6	32	25th, 27th	55	6th, 7th	3°54	26	11
JERSEY - - -	*	*	*	*	*	*	*	*	24	10
LONDONDERRY - -	35°5	45°2	40°4	27	22nd, 24th	54	13th, 14th	4°81	—	—
MARKEE CASTLE - -	34°0	? 42°6	? 38°3	21	24th	? 53	? 13th, 14th	5°36	18	8
BROOKEBOROUGH - -	33°6	43°2	38°4	21	24th	53	14th	4°96	—	—
ARMAGH - - -	34°9	43°2	39°1	24	22nd	55	14th	3°57	17	8
DUBLIN - - -	37°4	45°7	41°6	27	22nd	56	13th, 14th	2°01	32	14
PARSONSTOWN - -	*	*	*	*	*	*	*	*	32	14
VALENCIA - - -	*	*	*	*	*	*	*	*	18	8
FOYNES - - -	35°8	49°0	42°4	27	16th, 21st	56	18th	4°18	—	—

* For information see Table XXIII.

MONTHLY WIND CHART FOR DECEMBER 1884.

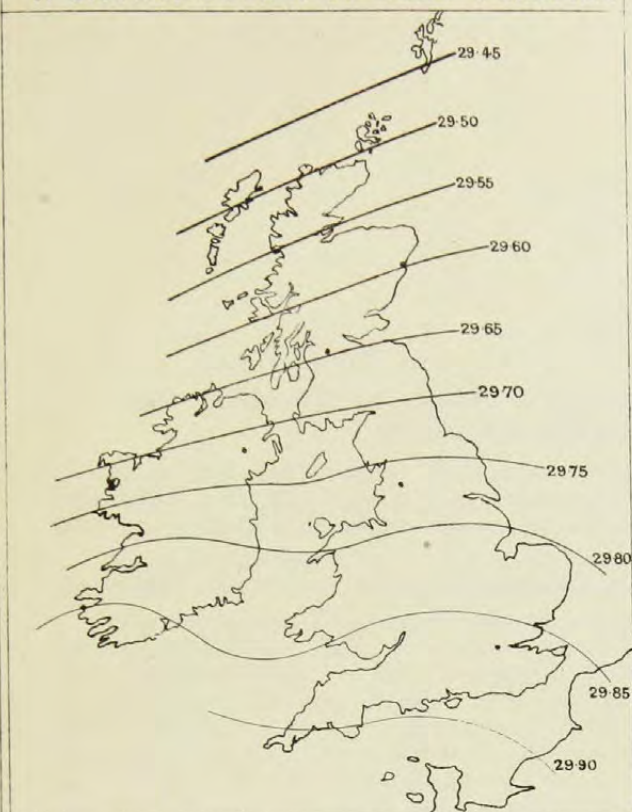
Plate XXIV.



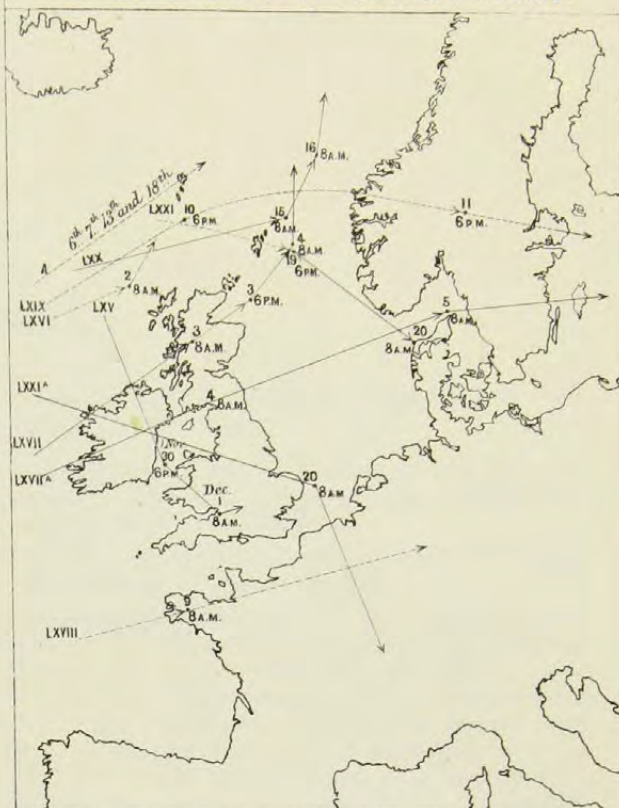
To face p. 130.

DANGERFIELD LITH. 22 BEDFORD ST. COVENT GARDEN.

1. DISTRIBUTION OF MEAN PRESSURE



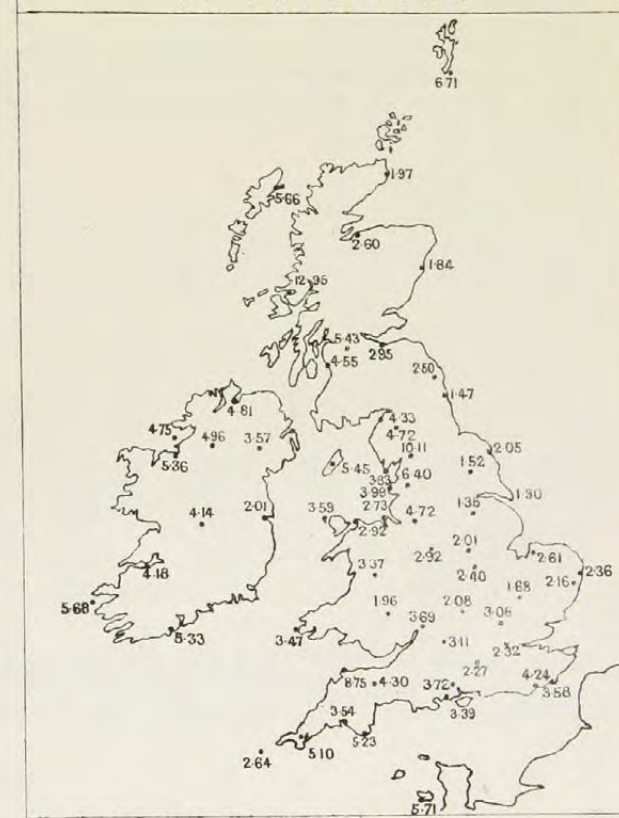
2. MOVEMENTS OF DEPRESSIONS.

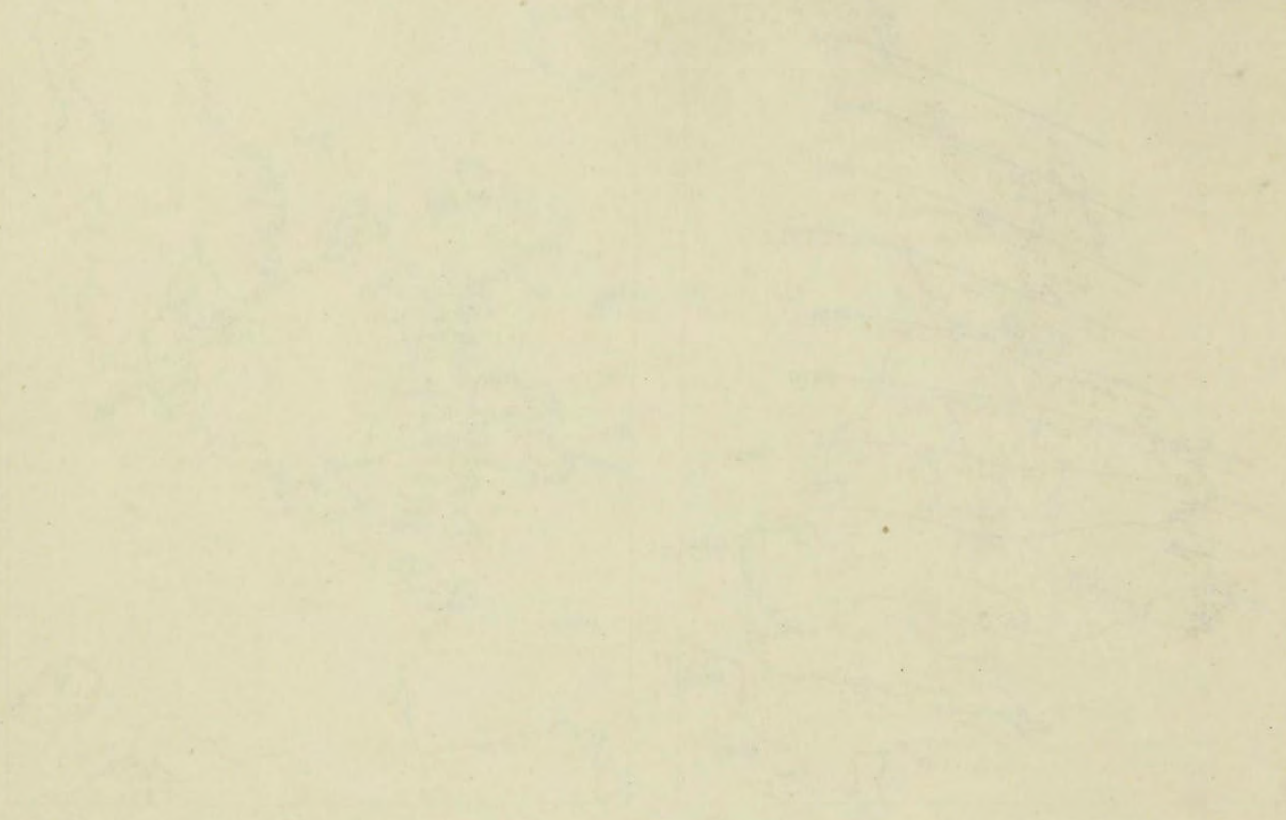


3. DISTRIBUTION OF MEAN TEMPERATURE.



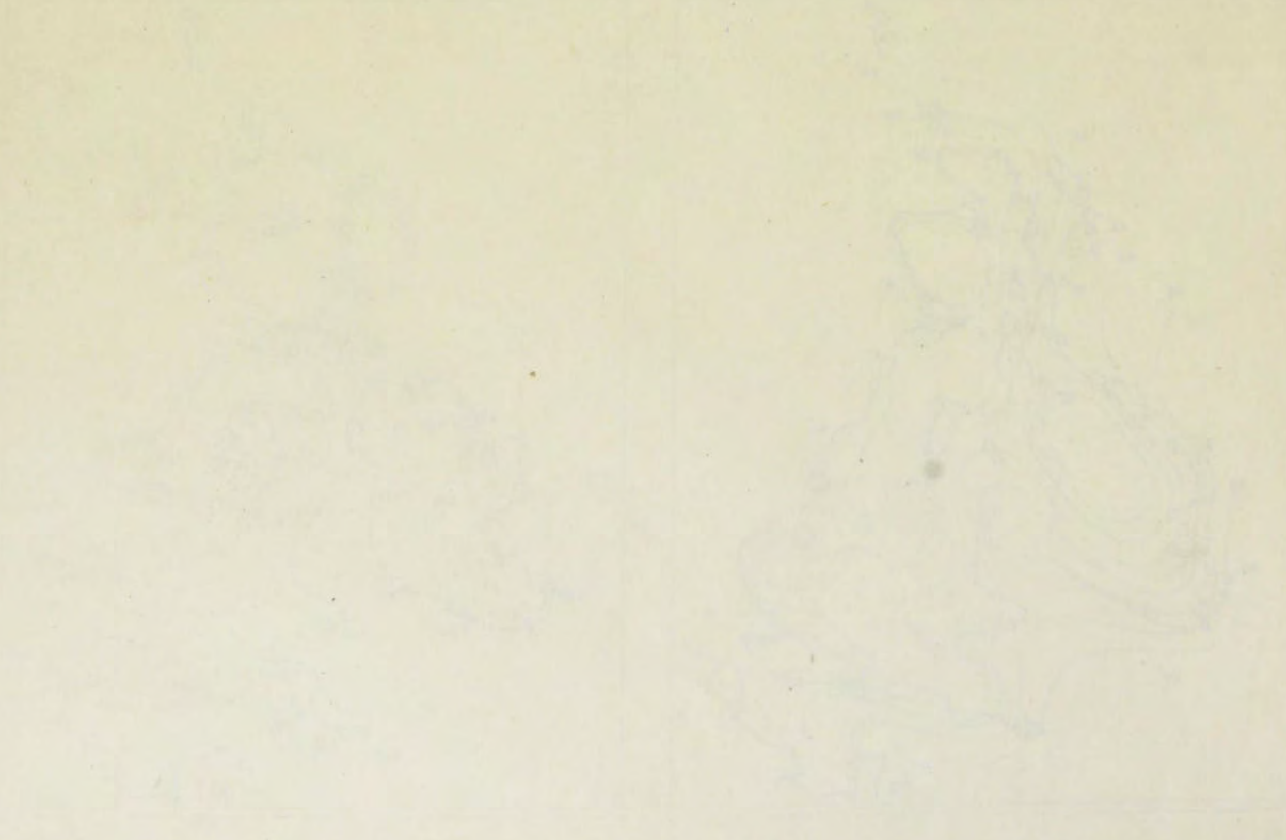
4. RAINFALL





1. DISTRIBUTION OF MEAN TEMPERATURE

2. DISTRIBUTION OF MEAN TEMPERATURE



APPENDIX.

APPENDIX I.

ON LONDON RAIN.—By W. J. RUSSELL, Ph.D., F.R.S., Lecturer on Chemistry at St. Bartholomew's Hospital Medical School.

It has been well shown by Dr. Angus Smith and others that much may be learnt with regard to the composition of the air of any place by examining the rain which falls there. I was therefore naturally led, while arranging and carrying on experiments on London fogs, to examine London rain.

These experiments have now extended over some length of time, in fact since November 1882, and up to a certain point they are sufficiently complete to allow of an account of them being given.

The composition of London rain has not, so far as I am aware, been much studied. Dr. Angus Smith, in his work on "Air and Rain," gives a few analyses of samples of rain collected for him, chiefly at the different Fire Brigade stations, but the composition of these samples, Dr. Smith states, was affected to a considerable extent by long exposure to the air, and are, therefore, hardly comparable with other samples more rapidly collected. It is undoubtedly difficult, and when the experiments extend over a long space of time almost impossible, to collect in a perfectly satisfactory way samples of rain. If a large open vessel be used to collect the rain, evaporation occurs to a very appreciable extent, and soot from some neighbouring chimney collects in the vessel, and thus causes varying results. By using a large funnel in a narrow-necked bottle the loss by evaporation to any detrimental extent is stopped, and large flakes of soot may be excluded by stretching a piece of rather coarse muslin, after well washing it, tightly over the funnel. The funnel is held by a ring of black india-rubber in the mouth of a Winchester quart bottle firmly supported to prevent its being blown over.

Another plan was tried, namely, putting a filter of Swedish paper inside the funnel and holding it in its place by the muslin over the top, so that all solid matter should as soon as possible be removed from the water; but this plan, as is shown by the following table, increases, not diminishes, the impurity of the samples:—

TABLE I.
COMPARISON of FILTERED and UNFILTERED RAIN WATERS.

	1884.							
	Jan. 26-8.	Jan. 31.	Feb. 1, 2.	Feb. 2-19.	Feb. 19-26.	Mar. 3, 4.	Mar. 4-9.	Mar. 9.
Sulphuric acid:—								
Not filtered -	·0331	·0153	·0148	·0283	·0198	·0472	·0283	·0166
Filtered -	·0496	·0198	·0369	·0399	·0198	·0826	·0397	·0331
Hydrochloric acid:—								
Not filtered -	·0219	·0036	·0164	·0282	·0328	·0219	·0109	·0028
Filtered -	·0365	·0036	·0219	·0356	·0372	·0273	·0087	·0036

To collect the rain the bottles were kept out of doors ready, and, as soon as there was enough water for analysis, the sample was brought in and examined; when the storm lasted long enough two samples of the same downpour were analysed. At other times the rain was only collected after a considerable interval of dry weather.

The principal impurities in the rain of towns are no doubt sulphates and chlorides, and it is the amount of these salts present in the London rain which has been systematically determined, and, at present, only in certain cases have other impurities been looked for. In the following experiments the amounts of sulphates and chlorides present are expressed as so much sulphuric acid (H_2SO_4), and so much hydrochloric acid (HCl) in a litre of rain. Both determinations were made volumetrically. The sulphates were determined by a method similar in principle to that proposed by Angus Smith for determining the carbonic acid in the air, viz., by fixing on a particular amount of cloudiness, that most easily remembered and imitated by the operator, and using this as a standard in all cases. It was produced when 2 c.c. of a centinormal solution of sulphuric acid, diluted with 50 c.c. of water, was added to 10 c.c. of a barium chloride solution made from a saturated solution of barium chloride diluted with an equal volume of water, and acidulated with hydrochloric acid. Two tall cylinders, 12 inches high, with a diameter of 1 inch, were used for the experiments.

In one cylinder the standard amount of cloudiness was produced; in the other, after adding the regulation amount of acid barium chloride solution, the rain water was run in until, on standing, a like amount of cloudiness was obtained, the same amount of dilution being brought about in each case. A black mark below the plate-glass bottom of the cylinders helps very materially to show the amount of cloudiness. From experiments with a solution of sulphates of known strength and of about the same degree of dilution as the rain water, it was found that results of considerable accuracy could be obtained by the above method, and I have, through the kindness of Messrs. Lawes, Gilbert, and Warrington, had the opportunity of checking my method against their more elaborate one. In their case large quantities of rain could be operated on, and the amount of sulphates determined by the gravimetric method.

This volumetric method seems to give results which are fairly accurate, and are rapidly and easily obtained. The amount of chlorides present was determined by a centinormal solution of silver nitrate, using about 100 c.c. of the rain water. A little chromate of potash was used as an indicator, and the experiment was made in a white porcelain basin. The rain water was always filtered before the amount of sulphates and chlorides were determined. To determine the ammonia present the rain water was Nesslerized in the ordinary way.

Three principal stations have been used for collection of the rain. One station was in the City, at St. Bartholomew's Hospital; here the collecting bottle was placed on some leads about 10 feet from the ground in an open situation, so that the samples collected are probably rather above than below the average of purity for this neighbourhood. Another station was on the north-west of London, in an open garden in Upper Hamilton Terrace, the collecting bottle standing on the ground. The nearest chimney was at a distance of 50 yards, and lay to the east; on the west there were no houses for a considerable distance. This station is about $3\frac{1}{4}$ miles in a direct line from St. Bartholomew's Hospital. The third station was at Shacklewell Green, Hackney, which, in a direct line, is about 3 miles from St. Bartholomew's Hospital, and lies on the north-east of London. Here also the bottle was placed on the ground in an open garden, and it was also fully 50 yards from any chimney. A good many samples have also been collected at other places, but these will be noticed separately.

First, with regard to the rain collected at St. Bartholomew's, it was always more or less dirty from soot floating in it, and disagreeable in taste. As before mentioned, the samples were collected and analysed as soon as enough rain had fallen to furnish the required amount of water. The amount of rain which fell I had not the means of accurately determining; the time and the direction of the wind, when the rain occurred, have been put into the following table from observations made at the time, but these have been supplemented and checked by the observations taken at Lloyd's, which have, through the kindness of Mr. Fowler, been put at my disposal. The following numbers express, then, as far as the sulphates and chlorides are concerned, the composition of each individual sample of rain.

I think there is a general impression that London rain is acid, and the first sample collected at St. Bartholomew's Hospital certainly was so—in fact so acid that I easily determined with a decinormal solution of carbonate of soda, the amount of acid present.

After this preliminary experiment and the systematic collection began, I did not find any sample of rain to be acid; by this I mean that none would, with our most delicate indicators, litmus, or methyl orange, give the least indication of acidity.

At the City station 38 samples of rain have been collected, at Hamilton Terrace and at Hackney 32. The results obtained from the analysis of these samples are given in the following table:—

TABLE II.

ST. BARTHOLOMEW'S HOSPITAL, E.C.

DATE		1882.										1883.									
		Oct. 15-21.	Oct. 21-26.	Oct. 26-28.	Oct. 28 Nov. 6.	Nov. 6-13.	Nov. 13-16.	Nov. 18-23.	Nov. 24 to Dec. 6.	Dec. 6 to Jan. 8.	Jan. 8-16.	Jan. 16-28. Feb. 3.	Feb. 3-12.	Feb. 12-18.	Mar. 8.	Apr. 2.	Apr. 20-24.	Apr. 28.	May 7-8.	May 11-12.	
		N.W.	S.E.	N.E.	S.W.	S.W.	N.E.	S.W.	S.W.	S.W.	S.W.	W.S.W.	N. and S.E.	S.	S.	E.	S.E.	E.	S.E.	E. and W.	S.W.
Sulphuric acid	-	.0266	.0211	.0165	.0268	.0216	.0139	.0248	.0198	.0248	.0168	.0283	.0132	.0117	.0236	.0165	.0827	.0661	.0292	.0320	.0248
Hydrochloric acid	-	.0075	.0073	.0053	.0155	.0164	.0146	.0120	.0153	.0091	.0135	.0273	.0087	.0069	.0080	.0084	.0466	.0310	.0073	.0131	.0066
Total	-	.0281	.0284	.0218	.0423	.0386	.0285	.0368	.0351	.0339	.0303	.0556	.0219	.0186	.0316	.0249	.1203	.0971	.0365	.0451	.0314
Proportion	-	1:2:9	1:2:9	1:3:1	1:1:7	1:1:3	1:0:9	1:2:1	1:1:7	1:2:7	1:1:2	1:1:1	1:1:5	1:1:7	1:3:0	1:2:1	1:1:8	1:2:1	1:4:1	1:2:4	1:3:6

UPPER HAMILTON TERRACE, N.W.

Sulphuric acid	-							.0101	.0083	.0099	.0161	.0124	.0198	.0090	.0062	.0165	.0083	.0331	.0396	.0228	.0221	.0122
Hydrochloric acid	-							.0080	.0038	.0054	.0082	.0182	.0124	.0073	.0065	.0058	.0058	.0166	.0228	.0036	.0081	.0029
Total	-							.0181	.0141	.0153	.0243	.0306	.0322	.0163	.0127	.0223	.0141	.0407	.0624	.0264	.0302	.0151
Proportion	-							1:1:3	1:1:4	1:1:8	1:2:0	1:0:7	1:1:6	1:1:2	1:1:1	1:2:8	1:1:4	1:2:2	1:1:7	1:6:4	1:2:7	1:4:2

MILTON HOUSE, HACKNEY, E.

Sulphuric acid	-							.0040	.0184	.0141	.0248	.0000	.0260	.0090	.0079	.0121		.0461	.0221	.0248	.0198	.0141
Hydrochloric acid	-							.0053	.0095	.0033	.0095	.0055	.0102	.0065	.0062	.0058		.0240	.0101	.0043	.0087	.0044
Total	-							.0093	.0279	.0214	.0343	.0145	.0362	.0155	.0141	.0179		.0701	.0322	.0291	.0285	.0185
Proportion	-							1:0:7	1:1:9	1:2:0	1:2:5	1:1:6	1:2:5	1:1:4	1:1:3	1:2:1		1:1:9	1:2:2	1:6:2	1:2:2	1:3:2

TABLE II.—continued.

ST. BARTHOLOMEW'S HOSPITAL, E.C.

DATE	1883.										1884.							
	May 26.	June 18-22.	June 22-28.	June 28.	July 10-13.	July 14-22.	Oct. 1-31.	Nov. 30.	Jan. 25-26.	Jan. 29-28.	Jan. 31.	Feb. 1-2.	Feb. 2-19.	Feb. 19-26.	Mar. 3-4.	Mar. 4-9.	Mar. 9.	Mean.
	W.	S.W.	S.W.	S.W.	S.	S.	S.W.	W.	S.W.	S.W.	S.W.	S.W. and E.	S.W.	S.W.	E. to S.	S.W.	S.W.	
Sulphuric acid	•0902	•1984	•0396	•0496	•0661	•0396	•0661	•0331	•0153	•0331	•0153	•0148	•0283	•0108	•0472	•0283	•0166	•0362
Hydrochloric acid	•0366	•0467	•0401	•0292	•0365	•0127	•0292	•0073	•0032	•0219	•0036	•0219	•0282	•0228	•0219	•0109	•0028	•0178
Total	•1268	•2451	•0797	•0788	•1026	•0523	•0053	•0404	•0185	•0550	•0189	•0367	•0565	•0526	•0691	•0392	•0194	•0540
Proportion	1:2'6	1:4'2	1:0'9	1:1'7	1:1'8	1:3'1	1:2'4	1:4'5	1:4'8	1:1'5	1:4'2	1:0'7	1:1	1:0'6	1:2'1	1:2'3	1:6'0	1:2'0

UPPER HAMILTON TERRACE, W.

Sulphuric acid	•0359	•0196	•0248	•0099	•0331	•0248	•0248	•0331	•0269	•0150	•0198	•0165	•0248	•0166	•0283	•0331	•0110	•0201
Hydrochloric acid	•0073	•0087	•0073	•0014	•0525	•0054	•0043	•0047	•0109	•0127	•0051	•0248	•0168	•0153	•0054	•0036	•0014	•0101
Total	•0432	•0283	•0321	•0113	•0856	•0302	•0291	•0378	•0378	•0277	•0249	•0413	•0416	•0319	•0337	•0367	•0124	•0302
Proportion	1:4'8	1:4'2	1:3'4	1:7'0	1:0'6	1:4'6	1:5'7	1:7'1	1:2'4	1:1'2	1:3'8	1:0'7	1:1'5	1:1'0	1:5'2	1:9'7	1:7'8	1:2'0

MILTON HOUSE, SHACKLEWELL GREEN, E.

Sulphuric acid	•0331	•0165	•0248	•0099	•0165	•0198	•0331	•0248	•0320	•0248	•0180	•0198	•0283	•0248	•0331	•0397	•0132	•0214
Hydrochloric acid	•0059	•0073	•0059	•0014	•0073	•0014	•0036	•0036	•0076	•0156	•0040	•0152	•0186	•0219	•0073	•0058	•0028	•0081
Total	•0390	•0238	•0307	•0113	•0238	•0212	•0404	•0284	•0396	•0404	•0220	•0350	•0469	•0467	•0404	•0455	•0160	•0395
Proportion	1:5'5	1:2'2	1:4'0	1:7'0	1:2'3	1:4'1	1:4'5	1:6'9	1:4'2	1:1'6	1:4'5	1:1'3	1:1'5	1:1'1	1:4'5	1:6'8	1:4'7	1:2'6

The numbers, as before explained, express in grammes the weight of sulphates and chlorides present, supposing them to exist as the hydrogen salts (H_2SO_4 and HCl). Further, in the above tables is given the total weight of sulphuric and hydrochloric acid found in each experiment, and the proportion which the sulphates bear to the chlorides, the amount of chloride present being taken as 1. All the samples of the same date were collected at the same time and in the same manner, so they are, as far as possible, comparable. The arithmetical mean of each set of experiments is as follows:—

TABLE III.

	St. Bartholomew's.	Hamilton Terrace.	Shacklewell.
Sulphuric acid - - -	·0388	·0196	·0207
Hydrochloric acid - - -	·0179	·0088	·0078
Total - - -	·0567	·0307	·0285
Proportion of chloride to sulphate.	1 : 2·2	1 : 2·2	1 : 2·6

These results show:—First, that the City rain contains twice as much impurity as that collected at the suburban stations. Second, that the impurities at all the stations are in the same proportion. Dilute the City rain with very nearly an equal bulk of water, and you have the rain of the suburbs. If the City rain was so far diluted as to have the same weight of sulphates and chlorides as are found in the suburban samples, then the Hamilton Terrace sample would contain sulphates ·0189, instead of ·0196, and ·0095 chlorides instead of ·0088; the Shacklewell Green would have ·0182, instead of 0·209 sulphates, and ·0091, instead of ·0089 chlorides, so that it appears on the average that the composition of the London rain differs very largely in amount of impurity, but very little with regard to the composition of the impurity. On comparing the three simultaneous experiments, it is also evident that, speaking generally, when the impurities, either sulphates or chlorides, are high or low at one station they are similarly affected at all of the stations. The following tables [Tables IV. (represented graphically in Plates A. and B.), and V.], in which the three simultaneous results are joined together, shows to the eye this general character, that, for instance, the sulphates as a rule at the different stations increase and diminish together, and that the same thing occurs with the chlorides.

Of course exceptions occur, but there certainly is much greater uniformity in composition between the simultaneously collected samples on the east and west of London than I should have anticipated. Again, if the results be grouped according to the time of year, a curious result is obtained. Calling October to March the winter months, and April to September the summer months, then at the three stations the winter and summer rain is as follows:—

TABLE V.

	Winter, 1882-83.	Summer, 1883.	Winter, 1883-84.
<i>St. Bartholomew's Hospital.</i>			
Sulphuric acid - - -	·0200	·0631	·0289
Hydrochloric acid - - -	·0117	·0266	·0167
Total - - -	·0317	·0897	·0456
Proportion - - -	1 : 1·7	1 : 2·4	1 : 1·7
<i>Hamilton Terrace.</i>			
Sulphuric acid - - -	·0116	·0252	·0225
Hydrochloric acid - - -	·0083	·0117	·0101
Total - - -	·0199	·0369	·0326
Proportion - - -	1 : 1·4	1 : 2·1	1 : 2·2

TABLE V.—*continued.*

—				Winter, 1882-83.	Summer, 1883.	Winter, 1883-84.
<i>Shacklewell Green.</i>						
Sulphuric acid	-	-	-	·0139	·0222	·0265
Hydrochloric acid	-	-	-	·0073	·0071	·0099
Total	-	-	-	·0212	·0293	·0364
Proportion	-	-	-	1 : 1·9	1 : 3·1	1 : 2·6

These three half-years are not sufficient for establishing general conclusions, but they seem to indicate that summer rain is more impure than winter rain. If the winter of 1882-83 and following summer, that of 1883, be compared, this is most strikingly the case. The total amount of salts at St. Bartholomew's was nearly three times, and at the other two stations nearly twice as much in the summer as in the winter six months; again, there is in the summer at each station an increase in the amount of sulphates over the chlorides. Evaporation must be the principal cause of the increase of impurity, but the increase of the proportion of sulphates to chlorides in the summer is remarkable, and it appears is not caused by evaporation, for on evaporating over a water-bath 150 c.c. of rain to only 75 c.c. the proportion between the sulphates and chlorides was unchanged, and on evaporating some of the same rain at ordinary temperatures, by exposing it in a basin freely to the air in a room until reduced to half its bulk, it increased in strength, but gave no indication of loss of hydrochloric acid:—

—				Original Rain.	After evaporation at 100° C.	After evaporation at ordinary temperatures.
Sulphuric acid	-	-	-	·0248	·0496	·0661
Hydrochloric acid	-	-	-	·0087	·0175	·0219
				1 : 3·0	1 : 3·0	1 : 2·9

The most probable explanation of this increase of the sulphates in the summer, is, that it arises from the decomposition of animal and vegetable matter, volatile sulphur compounds being eliminated and afterwards oxidised. The samples collected during the past winter 1883-84 are, however, more impure than those of the previous winter, and contain proportionally more sulphates; in fact, at the Hackney station during the last winter, there was a greater amount of impurity than in the previous summer, but that is the only exception, and the great prevalence of South-west winds during last winter may be the cause of this; in fact it is reasonable to suppose that the exceptional winter we have had may have caused exceptional results. From comparatively so short a series of observations, one cannot with certainty learn much, but the differences indicated in these tables are of interest and importance.

That an increase in the amount of sulphates in rain also occurs in the summer months in the country is shown by the experiments of Messrs. Lawes, Gilbert, and Warrington, for they found that at Rothamsted on the average for two years in the winter the sulphates amounted to ·0027, while in the summer there was ·0032 present. The chlorides were, however, much less in the summer than in the winter. At all the stations the variations of amount of sulphates and chlorides are very considerable. At St. Bartholomew's the amount of sulphates varied from 0·1984 grammes in the litre which was contained in the rain falling between the 18th and 22nd June to 0·0117, which was in the rain falling between the 3rd and 12th February 1883, and the maximum amount of chlorides was coincident with that of the maximum of sulphates, while the smallest amount was during a storm on March 9th, 1884, when only ·0028 grammes were present and a very small, but not quite the smallest, amount of sulphates. On two occasions, April 2nd and April 20th, 1883, both the sulphates and the chlorides were above the average at all the stations. On five occasions, April 3rd, 20th, May 26th, June 22nd, and March 3rd, the amount of sulphates present was above the average at all stations. That a greater difference in the amount of impurity should not exist between the rain collected simultaneously on the east and west of London is

curious, but the results show that the average amount is much the same at the two places. Still the sample from Hamilton Terrace, containing the smallest amount of sulphates, was collected when a west wind was blowing, and the smallest amount of sulphates at Shacklewell Green was collected when an East wind blew. It would be interesting to have other and well-selected stations round London, specially some on the south-west side. Probably in most cases when it rains, a high wind is not blowing, and what may be called the normal atmosphere of London predominates. The analyses of the samples collected on March 4th to 9th and on the 9th show the purifying effect of a good downpour of rain. A sample of rain was collected early on the 9th March, the rain continued most of the day and another sample was collected by the evening. These two samples from each station gave:—

TABLE VI.

—			St. Bartholomew's.		Hamilton Terrace.		Shacklewell Green.	
Sulphates	-	-	·0397	·0331	·0331	·0110	·0397	·0132
Chlorides	-	-	·0087	·0036	·0036	·0014	·0058	·0028

In fact it is only necessary to collect London rain in order to be convinced of its beneficial action as a washing agent.

In order to determine the amount of solid matter present in the rain collected at St Bartholomew's, two samples were evaporated to dryness over a water-bath and the residue weighed; in the first sample 0·17 grammes and in the second, 0·14 grammes were found per litre. The latter residue on ignition left only ·055 of incombustible matter.

A few samples of rain have also been collected at the same time and in the same manner as the foregoing ones, but at different places. One set was collected at St. Bartholomew's, but nearer to the ground, and in a yard at a distance of about 100 yards from the former collecting place. These results were intended simply as a check on the former ones, and to determine what amount of difference in composition would arise from this difference of position. The two sets of experiments are given in Table VII., and it will be seen that the differences are small and unimportant:—

TABLE VII.

ST. BARTHOLOMEW'S HOSPITAL.

On the leads over Dispensary:—

				1883.														
				Feb. 3-12.	Feb. 17-18.	April 2.	April 20-24.	April 28.	May 7-8.	May 11-12.	May 26.	June 12-18.	June 28.	July 10-13.	July 14.	July 15-22.	Oct. 1-31.	Mean.
Sulphuric acid	-	-	-	·0117	·0236	·0827	·0661	·0292	·0320	·0248	·0902	·0396	·0496	·0661	·0396	·0396	·0661	·0471
Hydrochloric acid	-	-	-	·0069	·0080	·0466	·0310	·0073	·0131	·0066	·0306	·0401	·0292	·0365	·0127	·0189	·0292	·0226
Total	-	-	-	·0186	·0316	·1293	·0971	·0365	·0451	·0314	·1208	·0797	·0788	·1026	·0523	·0585	·1053	·0697
Proportion	-	-	-	1 : 0·7	1 : 3·0	1 : 1·8	1 : 2·1	1 : 4·1	1 : 2·4	1 : 3·6	1 : 2·6	1 : 0·9	1 : 1·7	1 : 1·8	1 : 3·1	1 : 2·1	1 : 2·4	1 : 2·1

In the yard:—

Sulphuric acid	- - -	·0049	·0290	·0992	·0584	·0331	·0368	·0261	·0496	·0496	·0496	·0708	·0331	·0331	·0708	·0495
Hydrochloric acid	- - -	·0069	·0102	·0263	·0393	·0124	·0240	·0073	·0175	·0116	·0292	·0584	·0102	·0131	·0109	·0213
Total	- - -	·0118	·0392	·1255	·0977	·0455	·0608	·0334	·0671	·0612	·0788	·1292	·0433	·0462	·0817	·0708
Proportion	- - -	1 : 0·7	1 : 2·8	1 : 3·6	1 : 1·5	1 : 2·7	1 : 1·5	1 : 3·5	1 : 2·8	1 : 4·2	1 : 1·7	1 : 1·2	1 : 3·2	1 : 2·5	1 : 6·5	1 : 2·3

Another set of simultaneous samples was collected at Denmark Hill, and the interest of these is in their showing how local circumstances may cause great differences in the amount of rain impurities. These samples were collected on the ground in a garden and at about 20 yards from any chimney, but on the side of a hill, and although the situation was open, and therefore regarded as likely to give a fair sample of the rain of this district, still it will be seen from the following experiments, which extend from November 1882

till the end of July 1883, that the amount of both sulphates and chlorides is much greater than in the rain collected at St. Bartholomew's, the average total for the corresponding samples being, for St. Bartholomew's ·0567, and for Denmark Hill ·0789. Dividing them into summer and winter experiments, the same relation exists between them as in the former experiments, the summer rain being much more impure than the winter, in fact in this case three times as impure; but here the sulphates are in proportion to the chlorides in greater amount in the winter than in the summer.

TABLE VIII.

	Denmark Hill.	Winter.	Summer.
Sulphuric acid	-	·0236	·0622
Hydrochloric acid	-	·0119	·0442
Total	-	·0355	·1064
Proportion	-	1 : 2·0	1 : 1·4

However, there is still a certain relationship between these experiments and the others. In the sample collected on June 18th-22nd, the rain was excessively impure, far more so than on any other occasion, but on comparing it with the St. Bartholomew's rain of the same date, we find that it also contains the largest amount of sulphates ever found, together with a very large amount of chlorides. The conclusion seems to be that this collecting station at Denmark Hill, although it was an open space, still, owing to local circumstances, must give an unfair average for the district.

The best series of analyses of country rain are those of Messrs. Lawes, Gilbert, and Warrington of the rain collected during the last 13 months at Rothamsted, near St. Albans. The mean of these experiments is as follows :—

Sulphates	-	-	-	·0040
Chlorides	-	-	-	·0033
Total	-	-	-	·0073
Proportion	-	-	-	1 : 1·2

That is, there is about one-fifth the amount of sulphate and less than one half the amount of chloride in Rothamsted rain than there is in the rain of the suburbs, and only about one ninth the amount of sulphate and half the chloride that there is in the City rain.

Again, seven samples of rain have been collected at Slinfold, near Horsham, Sussex. The mean of these experiments gives—

Sulphates	-	-	-	·0048
Chlorides	-	-	-	·0041
Total	-	-	-	·0089
Mean	-	-	-	1 : 1·2

These numbers do not differ much from the Rothamsted numbers, but evidently the amount of chloride is increased by proximity to the sea. A single sample of rain collected on Dartmoor during a storm from the south-west gave the following results :—

Sulphates	-	-	-	·0005
Chlorides	-	-	-	·0087

The sulphates present were really only a trace, the number does not mean more than that; in fact, in this case, the air is uncontaminated by either the products of combustion or by the decomposition of animal or vegetable matters, the sulphates and chlorides in this air coming simply from sea water.

The question before alluded to of the acidity of London rain is interesting and important. At first sight the results which have been obtained are conflicting, but can, I think, be readily explained. As far as my experiments go, London rain, when collected as above described, is never acid, but if the rain be collected in an open vessel, which is left exposed for a considerable length of time, then the water will, I believe, always be acid. I am speaking now of City rain. This acidity, however, arises, not from acid washed directly out of the air, but from acid washed out of the soot which is always abundantly present in London air.

That the mere evaporation of the rain is not sufficient to cause this acidity seems proved by the following experiment: 150 c.c. of rain was evaporated under an air pump over calcium chloride, and from time to time tested, even when the 150 c.c. was reduced to only 15 c.c. it gave no signs of acidity. On the other hand, soot collected from the top of several chimnies yielded to water a solution distinctly acid, as shown both to litmus and methyl orange, and the amount of acidity was sufficient to be determined quantitatively. The following determinations were made by treating 2 grammes of the soot with water, and determining the acid by a decinormal carbonate of soda solution, using the methyl orange indicator:—

TABLE IX.
SOOT.—PERCENTAGE AMOUNTS OF ACID, &c.

Samples.	1.	2.	3.	4.	5.	6.	7.	8.	9.
Sulphuric acid - -	1·6	3·9	7·8	4·9	9·8				
Hydrochloric acid - -	3·1	2·1	3·2	4·0	8·9				
Total - -	4·7	6·0	11·1	8·9	18·7				
Proportion - -	1:0·52	1:1·8	1:2·4	1:1·2	1:1·1				
Acidity - - -	1·4	0·5	7·2	0·0	0·0	4·9	0·8	1·2	2·3
Ammonia - - -	0·6	0·4	1·8	1·8	8·0				

Two samples of soot, it will be seen, were not acid, but it is very difficult to collect such samples absolutely free from mortar, and judging from appearance in both these cases some was present, but the analyses were made and the results are given. It is also of interest to see the amount of sulphates and chlorides present in the soot; in one case there is only one half as much sulphate as chloride, in another two and a half times as much. One sample of rain collected in the city and examined after long exposure to the air was not acid, but this seems to confirm what is said above, for it was singularly free from soot. The sample was collected on the top of the Star Works of Messrs. De la Rue & Co., in Bunhill Row. If the soot in the London air be generally acid, its adherence to bodies and subsequent moistening by rain will tend to corrode those bodies, and as the surface becomes roughened so will the soot more readily and more firmly adhere and the disintegrating action will proceed with increased rapidity.

It seemed, at least, of scientific if not of practical interest, to ascertain whether arsenic could be found in London rain, or rather in London rain and soot. For this purpose simply open vessels were used to collect the rain, and some five or six litres were used. This amount was slightly acidulated with pure hydrochloric acid evaporated over a water-bath to a quarter of a liter, and filtered.

On adding 70 c.c. of this liquid to a bottle in which hydrogen generated from pure zinc with platinum attached, and which was proved to be perfectly free from arsenic, gave at once, as the hydrogen passed through a very small heated tube, an arsenic mirror, and on comparing this mirror with one similarly obtained from a known quantity of arsenic, a fair indication of the amount of arsenic in the rain water was obtained.

Two different samples of water collected in the City gave—

1st experiment	-	-	0·00021 grains of arsenious acid (As_2O_3)
2nd „	-	-	0·00020 „ „

in a gallon of rain.

There also appeared to be a trace of copper present in this same solution.

Another way of ascertaining the amount of impurities in the air, and one more under immediate control, is to condense and collect the moisture in air. For this purpose I had a large conical tin vessel constructed, 3 feet 6 inches high which could be filled with ice and suspended, cone downward, from a stand. The moisture as it trickled from it was collected and then treated as a rain water.

The following five experiments were made with this apparatus. It was placed out of doors and close to where the St. Bartholomew's rain specimens were collected. The last of these experiments was made on a day when there was a fog during the morning.

1883.	—	Jan. 15.	Jan. 30.	March 11.	April 28.	Mean.
Sulphates - - -	·1101	·1652	·0827	·0661	·2480	·1344
Chlorides - - -	·0353	·0219	·0196	·0547	·1215	·0506
Total - - -	·1454	·1871	·1023	·1208	·3695	·1850
Proportion - -	1 : 3·1	1 : 7·5	1 : 4·2	1 : 1·2	1 : 2·0	1 : 2·7
Ammonia - - -	0·005	0·004	0·01	—	—	0·006

Comparing the mean of these five experiments with the mean of the St. Bartholomew's rain, it will be seen that the sulphates and chlorides in the dew is very nearly in the same proportion as in the rain, but the dew contains about three times as much impurity as the rain. In the first three experiments the amount of ammonia was determined; these give as a mean six milligrammes to the litre. The rain collected on May 11th, 1883, at the three stations was tested for ammonia, and the amounts found were, at St. Bartholomew's, ·0038; at Hamilton Terrace, ·0009; and at Shacklewell Green, ·0024 milligrammes to the litre. The mean amount found during the last year at Rothamsted is 0·00057.

My assistant, Mr. W. J. Orsman, junr., has rendered me most efficient aid in carrying on the above experiments. They are really only tentative. In order to study more fully the composition of London rain, means for collecting larger quantities, so that more frequent analyses could be made, should be adopted, and to each specimen should be attached a full account of the direction and velocity of the wind at the time of collection, as well as of the amount of the rain which fell.

APPENDIX II.

ON THE AMOUNT OF CARBONIC ACID IN LONDON AIR.—BY W. J. RUSSELL, PH.D., F.R.S.

THE following experiments were commenced in connexion with other experiments undertaken to determine the chemical composition of London fogs. The absence of fogs of late has, however, delayed the completion of this work.

I therefore give, as desired, an account of the carbonic acid determinations, which have an interest of their own, and are really complete in themselves.

All the samples of air treated of in the following report were collected at St. Bartholomew's Hospital, in the City of London, in an open space, and at a height of 12 feet from the ground. Pettenkofers' method for the estimation of the carbonic acid was in all cases used. The bottles in which the samples were collected held between 9 and 10 litres, and were filled by means of a large aspirator, which drew a steady current of air through them for nearly 25 minutes. This was proved by experiment to be sufficient to expel the original contents of the bottle.

The experiments were commenced at the beginning of 1882, and were made at first entirely in relation to the fog experiments, the special object being to determine whether the amount of other impurities in the air at the time of the fog increased in the same proportion as the carbonic acid did.

During the first year, the samples of air were collected whenever there was a fog, and only occasionally and at irregular intervals when the weather was clear. In 1883 the samples of air began to be collected with tolerable regularity once a week, in the middle of the day, irrespective of weather, and this has been continued to the present time. In addition to this regular collection, other samples have been taken whenever during the day there was a fog or mist.

These determinations, 159 in number, are given with description of weather, temperature, direction of wind, &c., in Table I.

TABLE I.

Date.	Weather.	Temperature. C.		Barometer in m.m.	Direction of Wind.	Vols. of CO ₂ in 10,000 of Air.	
		Wet Bulb.	Dry Bulb.			1st Experiment.	2nd Experiment.
1882.							
January 7	Dull - - - - -	—	7.2	765	S.E.	5.2	5.4
" 16	Dull - - - - -	—	8.	782	S.	5.9	6.0
" 17*	Dense black fog - - - - -	—	10.	786	S.	6.4	6.7
" 18*	Dense black fog - - - - -	—	4.	786	S.	5.6	5.7
" 19*	Slight white fog - - - - -	—	6.	768	S.	4.8	—
" 25*	Dense black fog - - - - -	—	3.5	780	S.	10.5	10.5
" 26	Fine - - - - -	—	3.	775	S.W.	5.1	4.9
" 28	Fine - - - - -	—	11.	770	S.W.	5.6	5.6
" 31	Dull - - - - -	6.	8.	778	S.E.	4.8	4.8
February 1	Very fine - - - - -	3.	5.	780	N.W.	4.7	5.1
" 3*	Slight fog - - - - -	3.	4.4	781	S.	6.2	6.9
" 4*	Dense black fog - - - - -	4.	5.	775	S.	10.7	10.2
" 9	Clear - - - - -	2.7	4.4	773	S.E.	4.4	4.8
" 14	Very fine - - - - -	10.	15.	768	S.W.	4.1	—
" 18	Dull - - - - -	9.	11.5	766	W.	4.3	4.8
" 20	Dull - - - - -	6.	8.9	780	W.	4.7	4.9
" 21	Dull and misty - - - - -	10.	12.	777	N.W.	4.6	5.0
" 22	Very fine - - - - -	9.	12.	775	N.W.	4.5	4.6
" 27	Very bright after much rain - - - - -	10.	12.	742	W.	6.0	—
March 1	Very fine - - - - -	8.	12.	737	S.W.	4.0	4.1
" 11	Dull - - - - -	11.	12.5	773	N.E.	4.2	—
" 15*	White fog (9.30 a.m.) - - - - -	9.	11.	775	N.E.	5.0	5.6
" 20	Very fine - - - - -	6.	9.	763	N.	3.8	—
" 27	Very fine - - - - -	8.	13.	764	N.W.	3.9	—
April 4	Very fine - - - - -	9.	14.	761	N.E.	4.4	—

TABLE I.—*continued.*

Date.	Weather.	Temperature. C.		Barometer in m.m.	Direction of Wind.	Vols. of CO ₂ in 10,000 of Air.	
		Wet Bulb.	Dry Bulb.			1st Experiment.	2nd Experiment.
1882.							
April 19	Dull - - -	13.5	14.5	761	S.W.	4.5	4.2
" 20	Very fine - - -	15.5	19.5	761	E.	4.5	4.5
" 21	Very fine - - -	12.1	17.8	767	S.E.	4.4	4.3
" 24	Dull, showery - - -	10.1	14.4	750	S.W.	4.4	4.4
May 2	Dull, showery - - -	13.1	13.5	755	S.E.	4.5	—
" 12	Very fine - - -	13.5	20.1	768	W.	4.0	—
" 22	Dull - - -	16.1	19.1	756	S.E.	3.4	—
June 27	Very fine - - -	19.1	26.6	763	N.W.	3.6	—
" 28	Dull - - -	18.5	25.1	765	N.W.	3.8	4.0
July 20	Fine - - -	20.5	31.1	761	S.W.	3.5	3.6
" 21	Fine - - -	14.4	22.2	762	S.W.	3.3	3.4
" 27	Very fine - - -	26.6	28.8	770	S.W.	3.4	3.5
" 29	Very fine - - -	21.6	25.5	766	N.E.	3.3	—
" 31	Very fine - - -	17.2	30.5	770	N.W.	4.0	3.9
August 1	Dull - - -	18.3	22.2	766	N.W.	3.2	3.6
" 7	Very fine (Bank Holiday)	18.5	22.5	765	N.E.	3.0	3.1
October 4	Dull - - -	15.7	16.1	773	S.E.	3.7	3.9
" 9	Very fine - - -	14.4	18.3	765	S.	3.4	3.5
" 10	Dull - - -	15.0	17.2	765	S.	3.9	—
" 12	Dull after much rain - - -	11.1	12.7	748	N.W.	3.5	—
" 16	Dull after much rain - - -	8.3	8.8	753	S.E.	3.5	—
" 17	Dull after much rain - - -	9.4	10.5	760	N.	4.0	—
" 18	Dull - - -	10.5	11.6	768	N.E.	5.1	—
" 21	Dull, with rain - - -	12.7	13.8	748	S.E.	4.1	—
" 23	Fine - - -	8.8	12.7	748	W.	6.4	—
" 24	Dull; strong gales - - -	5.5	7.2	735	N.W.	3.8	4.0
" 25	Very fine - - -	8.8	11.1	750	W.	4.6	—
" 26*	White fog (10.30 a.m.) - - -	6.6	7.7	750	W.	9.9	—
" 27	Very fine (12.30) - - -	8.3	11.1	751	W.	5.0	—
" 28	Dull - - -	9.4	10.5	747	N.E.	3.7	3.8
November 1	Fine - - -	9.5	11.3	748	N.W.	3.8	3.4
" 4	Fine after heavy gale - - -	9.4	12.7	754	W.	3.7	—
" 8	Very fine after rain - - -	7.7	11.6	740	W.	3.6	—
" 13	Dull - - -	5.5	7.2	760	E.	3.7	—
" 17	Fine, after snow - - -	3.3	5.0	759	N.	3.2	—
" 18*	Dense black fog - - -	2.2	2.7	760	S.E.	9.6	—
" 22	Fine. Sun 1½ hours after above - - -	2.5	5.5	760	S.E.	5.0	—
" 23	Dull - - -	3.3	6.1	750	S.E.	4.1	—
" 29	Dull, after much rain - - -	7.2	8.3	755	N.W.	4.1	—
December 1*	Thick white fog (11 a.m.) - - -	1.6	2.2	765	S.	5.5	—
" 2	Dull and misty (3.30 p.m.) - - -	0.5	1.1	765	S.	4.1	—
" 2*	Slight mist - - -	1.1	1.6	766	S.E.	5.1	—
" 5	Very dull - - -	6.1	8.6	740	S.	5.0	—
" 8	Fine - - -	2.2	3.3	747	N.	4.0	—
" 10*	Thick white fog - - -	0.5	1.1	755	S.W.	9.4	—
" 11*	Thick white fog. Darker, 12 a.m. - - -	0.0	0.5	755	S.W.	11.0	—
" 11*	Thick white fog. Very dark, 5 p.m. - - -	0.0	0.5	755	S.W.	14.1	—
" 12	Dull and hazy - - -	0.0	1.1	760	S.W.	4.7	—
" 13	Fine - - -	6.1	8.3	760	W.	4.5	—
" 14*	White fog (wet) - - -	4.4	4.4	755	S.E.	6.2	—
" 15*	White fog - - -	5.1	6.1	753	S.E.	5.4	—
" 16*	Overhead fog, white - - -	3.3	4.4	760	S.E.	4.8	—
" 17	Dull - - -	8.3	9.4	752	S.	3.8	—
" 19	Dull and hazy - - -	8.8	10.1	760	S.E.	4.4	—
" 20*	Thick black fog at 10.30 a.m. - - -	4.4	4.7	767	S.	8.1	—
" 21	Fine (at 12) - - -	4.4	4.7	767	S.	5.2	—
" 21	Very fine - - -	4.4	4.8	761	W.	4.0	—

TABLE I.—continued.

Date.	Weather.	Temperature. C.		Barometer in m.m.	Direction of Wind.	Vols. of CO ₂ in 10,000 of Air.
		Wet Bulb.	Dry Bulb.			
1883.						
January 8	Very fine - - - - -	3.8	5.2	764	N.E.	4.8
" 11	Dull - - - - -	5.5	7.1	749	E.	3.9
" 16	Fine after rain - - - - -	7.7	10.5	758	S.W.	4.1
" 17	Dull, hazy - - - - -	10.1	11.1	765	S.W.	4.7
" 19*	Foggy - - - - -	10.1	8.8	763	S.W.	5.0
" 22	Very fine - - - - -	3.3	5.2	777	N.E.	3.8
" 24	Very fine - - - - -	4.4	7.2	751	W.	3.7
" 25	Fine - - - - -	3.6	6.1	763	W.	4.1
" 30	Dull - - - - -	5.1	7.2	752	W.	5.0
February 6	Fine - - - - -	5.1	7.2	755	E.	3.7
" 14	Dull, rain - - - - -	6.1	7.1	755	S.E.	4.2
" 22	Fine - - - - -	10.1	11.1	775	N.W.	4.2
" 27	Dull - - - - -	6.1	7.7	773	N.W.	3.9
March 6	Very fine - - - - -	1.6	5.0	765	N.E.	5.8
" 13	Fine - - - - -	2.7	5.5	752	N.E.	4.3
" 15	Fine - - - - -	1.1	3.3	750	N.E.	4.0
" 21	Fine - - - - -	1.6	4.4	751	N.E.	3.9
" 27	Dull - - - - -	2.7	6.1	761	N.W.	3.8
" 31	Fine - - - - -	6.1	8.8	758	N.W.	3.7
April 3*	Very foggy - - - - -	10.1	12.2	762	W.	13.3
" 5	Overcast - - - - -	14.4	18.3	759	S.E.	4.8
" 8*	Dull, slight fog - - - - -	7.7	11.1	756	S.E.	4.7
" 13	Dull - - - - -	9.4	15.5	758	S.	4.1
" 17	Dull - - - - -	5.5	7.2	752	S.E.	4.0
" 20	Fine - - - - -	2.2	4.4	762	S.E.	4.0
" 28	Fine - - - - -	10.0	15.0	754	N.W.	3.6
" 30	Very fine - - - - -	11.6	16.1	756	N.W.	3.7
May 6	Fine - - - - -	12.2	18.3	761	W.	3.6
" 12	Dull - - - - -	12.2	13.8	765	S.W.	4.0
" 14	Dull (Whit Monday) - - - - -	14.4	17.7	758	S.E.	3.3
" 16	Very fine - - - - -	16.1	20.5	758	N.W.	3.6
" 20	Very fine - - - - -	15.5	20.1	761	W.	3.5
" 24	Very fine - - - - -	15.0	23.3	764	N.W.	3.4
" 31	Very fine - - - - -	15.1	21.6	765	S.	3.8
June 6	Very fine - - - - -	16.6	21.6	756	W.	3.6
" 13	Very fine - - - - -	17.2	23.3	760	N.W.	3.5
" 20	Dull, with rain - - - - -	13.3	16.6	758	S.E.	3.5
August 5	Dull, after rain (Bank Holiday) - - - - -	15.0	17.2	762	N.W.	3.3
October 10*	Dull, yellowish fog - - - - -	12.2	13.8	760	N.W.	4.5
" 11*	Dense black overhead fog, 10.30 a.m. - - - - -	11.6	12.7	758	S.E.	7.6
" "	Fine sun after, 3.30 p.m. - - - - -	12.2	13.3	758	N.W.	5.1
" 18	Very fine - - - - -	8.8	12.2	756	N.W.	3.8
" 25	Dull - - - - -	14.4	16.6	757	W.	5.1
" 30	Dull and misty - - - - -	11.1	12.2	772	S.E.	3.9
November 6	Dull - - - - -	7.2	8.5	739	N.E.	4.2
" 15*	Dull and foggy - - - - -	5.5	7.7	761	W.	6.6
" 22	Dull - - - - -	9.4	11.6	753	S.E.	3.7
" 29	Very fine - - - - -	7.2	10.0	752	N.E.	3.8
December 4	Very fine - - - - -	3.8	6.6	754	N.W.	3.4
" 6	Dull and snowstorms - - - - -	0.5	2.2	764	N.E.	4.5
" 7	Fine - - - - -	1.1	3.3	763	N.E.	4.5
" 10	Dull and misty - - - - -	6.6	8.8	758	N.W.	4.3
" 12	Dull, stormy - - - - -	7.2	9.4	756	W.	3.9
1884.						
January 16*	Dull, slight fog - - - - -	6.1	7.2	776	N.W.	5.5
" 17	Very dull - - - - -	6.3	7.6	771	W.	4.2
" 18*	Dull and foggy - - - - -	6.6	8.3	775	S.W.	4.5
" 22	Dull and stormy - - - - -	8.8	11.1	762	W.	3.3
" 24	Very fine - - - - -	3.3	6.1	758	N.W.	4.1
" 26	Dull and rainy - - - - -	6.1	7.2	763	S.W.	4.1

TABLE I.—*continued.*

Date.	Weather.	Temperature. C.		Barometer in m.m.	Direction of Wind.	Vols. of CO ₂ in 10,000 of Air.
		Wet Bulb.	Dry Bulb.			
1883.						
January 28	Very fine - - - - -	5.0	7.2	763	N.W.	3.7
February 7	Dull - - - - -	5.6	7.0	768	S.W.	4.1
" 8*	Black fog, 10.30 a.m. - - - - -	6.1	7.7	747	S.E.	4.5
" "	Black fog, 2 p.m. - - - - -	6.1	7.7	747	S.E.	5.1
" "	Black fog, 6 p.m. - - - - -	6.1	7.7	747	S.E.	5.5
" 16	Very fine - - - - -	3.8	6.1	762	S.E.	3.5
" 18	Very fine - - - - -	6.1	8.3	761	E.	4.0
" 21	Dull and rain - - - - -	6.1	8.3	763	S.E.	4.0
" 28	Dull - - - - -	6.1	7.7	760	S.E.	3.8
March 6	Fine - - - - -	8.3	10.5	759	S.E.	3.9
" 13	Fine - - - - -	11.1	13.8	765	S.W.	3.7
" 27	Dull - - - - -	2.7	6.1	764	E.	3.7
April 25	Dull - - - - -	6.1	8.3	750	N.E.	4.1
" 27*	Overhead fog, 11.30 a.m. - - - - -	7.2	8.3	754	S.E.	5.3
" "	After, clear at 2 p.m. - - - - -	7.2	8.3	754	S.E.	4.6
" 28	Yellowish fog (slight) - - - - -	8.8	10.0	753	S.E.	4.8
May 9	Dull - - - - -	9.4	11.6	762	S.E.	3.8
" 15	Dull - - - - -	12.7	15.3	757	S.E.	4.1

From this table are taken out all the special determinations made during a fog or even a mist, and these are put together in Table II. At the commencement of the investigation, when two experiments were made, the samples of air were in a few cases collected simultaneously, but generally the second sample was collected about an hour after the first one. Omitting, then, from Table I. all the fog experiments (marked by an asterisk), and in the case of where there are two experiments, taking the mean, then the mean of all these determinations is 4.03; this represents the volume of carbonic acid in 10,000 volumes of London air.

Taking the years separately, the mean for 1882 is 4.10; for 1883, 3.98; and for 1884 up to May, 3.92.

It appears, then, that the average amount of carbonic acid in the City in ordinary weather is not appreciably above four parts in 10,000 of air, and if we take the results of 1883 and the first half of the present year, and these are the more systematically carried out experiments, then the average amount is only 3.96.

This number seems to compare favourably with other towns. Dr. Angus Smith, in Manchester in ordinary weather, found 4.03, in Perth 4.14, and in Glasgow 5.02 parts of carbonic acid in 10,000 of air.* Roscoe and McDougall found in Manchester air 3.92 of carbonic acid. With regard to previous experiments on London air, and it is to be remembered that all the experiments here given are from the very centre of London, those of Angus Smith are, as far as I know, the only systematic ones recorded. He found in 1864, as the mean of five experiments, that the amount of carbonic acid in the air of the parks of London was 3.01, and in the streets 3.80;† and in 1869 as the mean of 35 analyses of air from different parts of London he found 4.39.

It has been generally assumed that the normal amount of carbonic acid in pure air is four parts in 10,000, but the elaborate and careful experiments that have of late been carried out on the Continent, seem clearly to show that this number is much too high.

The extensive series of experiments carried on by F. Schultze, at Rostock, who analysed the air daily for four years (1868-71), give as a mean only 2.9197, the maximum being 3.44, and the minimum 2.25 parts per 10,000.

Schultze also deduces from his experiments that the amount of carbonic acid does not vary with the time of year.

Thorpe,‡ from a series of 77 very carefully conducted experiments, concludes that the air over the sea contains 3.011 parts of carbonic acid, while he assumes, from the experiments of others, that air over the land contains 4.04.

G. F. Armstrong§ found in the air at Grasmere 2.96 parts during the day and 3.30 parts during the night, and assumes that the land air contains 3.5 parts in 10,000.

Reiset at Dieppe obtained in 1872-73 as the mean of 92 experiments 2.942 parts per 10,000 of air.

Further, the elaborate experiments made at the Montsouris Observatory give as a mean of the determinations from 1877-82, 3.000,|| and, lastly, the mean of the experiments of Angus Smith, made in

* "Air and Rain."—Angus Smith.

§ Proceedings of Royal Soc., 1880.

† "Air and Rain," p. 8.

|| Annuaire de l'observation de Montsouris 1883, p. 379.

‡ "Chem. Soc. Jour.," Vol. XX.

1865 of the air on the Scotch hills, is 3·36 parts per 10,000 of air. These appear to be the most important determinations of the amount of carbonic acid in pure air the difference between them is not great; and on taking the mean of these five sets we get the number 3·036, which probably fairly represents the amount of carbonic acid in the purest air.

On comparing this amount with that found in the centre of London, we see that the increase is only 1 part in 10,000 of air. On examining Table I. it will also be seen that it very often happens that the amount of carbonic acid is very considerably below the average, and that when this is the case the weather is fine with bright sun. The diminution of the amount of carbonic acid in bright weather in the country has been assumed to arise from the increased activity of the chlorophyll in vegetation. In the City the diminution probably arises from the production of an active circulation in the air. The smallest amount of carbonic acid found in the City air was 3·0 and this was on a Bank Holiday, August 7, 1882; in fact, it appears that the amount is usually low on these holidays, for on both Whit Monday and the August Bank Holiday of last year, the carbonic acid only amounted to 3·3 parts.

In country air, as before mentioned, it appears that the amount of carbonic acid does not vary with the time of year in London as we should naturally expect it does. The following are the results obtained by taking the mean of the summer (April—September) and of the winter (October—March) observations separately:—

		Vols. of CO ₂ per 10,000 of Air.	
		WINTER.	SUMMER.
1882	- - -	4·70 (Jan.—Mar. only.)	3·86
1882-83	- - -	3·94	3·72
1883-84	- - -	4·01	

Which give as a mean for the three winters 4·22, and for the two summers 3·79 parts per 10,000 of air.

Turning now to the cases in which the average amount of carbonic acid has been exceeded, we find this is always the case when there is any fog or mist. Evidently, then, the products of combustion and respiration cannot pass freely away, but accumulate often to a very considerable extent in the lower air. The cases when there is no fog and the carbonic acid is above the average are when the weather is dull and gloomy and the air still. Table II. gives exclusively the results of experiments made when there was either a fog or a mist, and shows very well the great accumulation of carbonic acid which often occurs. The results of the experiments are shown graphically in Plates C. and D.

TABLE II.
FOG AND MIST EXPERIMENTS.

Date.	Weather.	Temperature. C.		Barometer in m.m.	Direction of Wind.	Vols. of CO ₂ in 10,000 of Air.
		Wet Bulb.	Dry Bulb.			
1882.						
January 17	Dense black fog - - - -	—	10°	786	S.	6·7
" 18	Dense black fog - - - -	—	4°	786	S.	5·7
" 19	Slight white fog - - - -	—	6°	768	S.	4·8
" 25	Dense black fog - - - -	—	3·5	780	S.	10·5
February 3	Slight fog - - - -	3°	4·4	781	S.	6·9
" 4	Dense black fog - - - -	4°	5°	785	S.	10·7
March 15	Slight white fog - - - -	9°	11°	775	N.E.	5·6
October 26	White fog - - - -	0·6	7·7	750	W.	9·9
November 18	Dense black fog - - - -	2·2	2·7	760	S.E.	9·6
December 1	Thick white fog - - - -	1·6	2·2	765	S.	5·5
" 2	Slight mist - - - -	1·1	1·6	766	S.E.	5·1
" 10	Thick white fog - - - -	0·5	1·1	755	S.W.	9·4
" 11	Thick white fog, darker noon - - - -	0·0	0·5	755	S.W.	11·0
" "	Thick white fog, very dark 5 p.m. - - - -	0·0	0·5	755	S.W.	14·1
" 14	White fog, slight - - - -	4·4	4·4	755	S.E.	6·2
" 15	White fog, slight - - - -	5°	6·1	753	S.E.	5·4

TABLE II.—*continued.*

Date.	Weather.	Temperature, C.		Barometer in m.m.	Direction of Wind.	Vols. of CO ₂ in 10,000 of Air.
		Wet Bulb.	Dry Bulb.			
1882.						
December 15	Overhead fog, white	3.3	4.4	760	S.E.	4.8
" 20	Dense black fog	4.4	4.7	767	S.	8.1
1883.						
January 19	Slight fog	10.1	8.8	763	S.W.	5.0
April 3	Fog, dense	10.1	12.2	762	W.	13.3
" 8	Slight white fog	7.7	11.1	756	S.E.	4.7
October 10	Slight yellow fog	12.2	13.8	760	N.W.	4.5
" 11	Dense black fog	11.6	12.7	758	S.E.	7.6
November 15	Slight yellow fog	5.5	7.7	761	W.	6.6
1884.						
January 16	Slight yellow fog	6.1	7.2	776	N.W.	5.5
" 18	Slight fog	6.6	8.3	775	S.W.	4.5
February 8	Black fog	6.1	7.7	747	S.E.	5.5
April 27	Overhead fog	7.2	8.3	754	S.E.	5.3
" 28	Yellowish fog, slight	8.8	10.0	753	S.E.	4.8
						29) 207.3
						Mean - 7.2

The largest amount of carbonic acid found was 14.1 parts, this was on December 11th, 1882, and was during a long-continued fog. On referring to the table it will be seen that the fog had begun on the previous day, when there was a "thick white fog," and the carbonic acid had then increased to 9.4; at noon on the 11th there were 11.0 parts, and at 5 p.m. the carbonic acid had increased to 14.1 parts in the 10,000 of air, that is, there was more than three and a half times the normal amount present. Supposing, then, this had been an increase of only pure carbonic acid, such a change in the composition of the atmosphere would be felt by most people, but an accumulation of carbonic acid means, certainly, a very large accumulation of other bodies, which probably are more, rather than less, deleterious than carbonic acid itself.

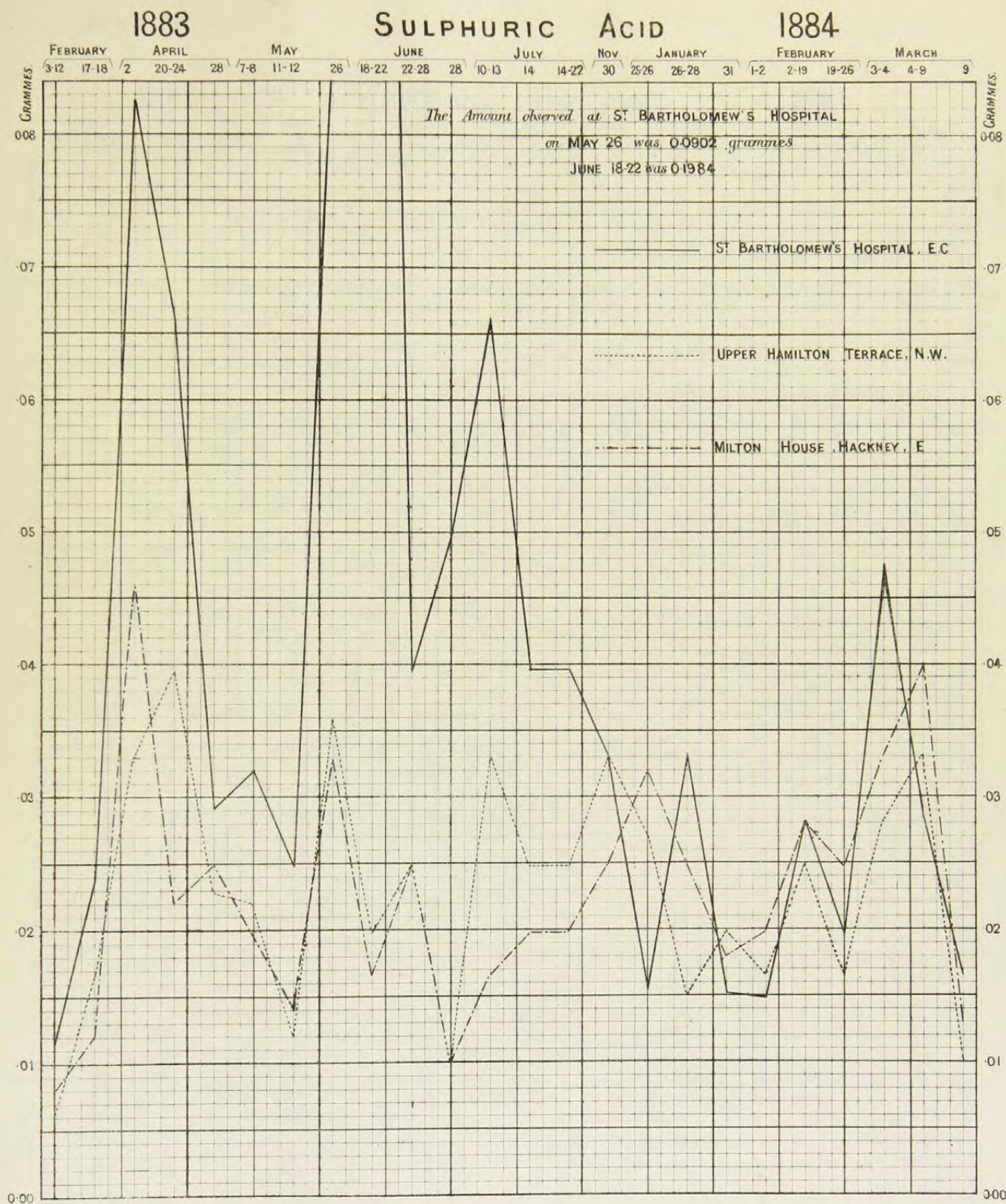
In Table I. will be seen several instances of the rapid change in the composition of the air with the clearing off of a fog. The following are instances:—

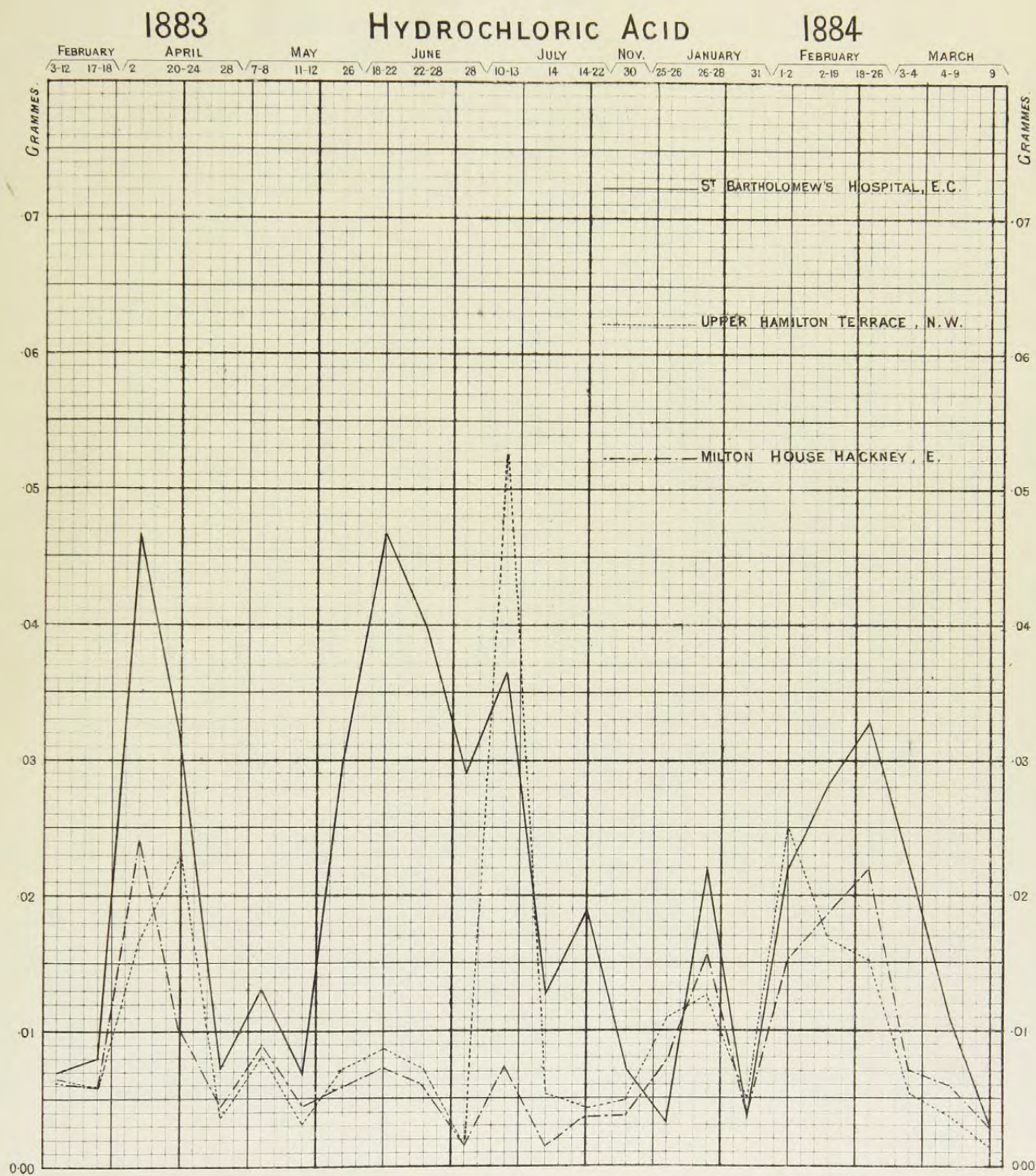
Date.	Vols. CO ₂ per 10,000 of Air during Fog.	Vols. CO ₂ per 10,000 of Air when Fog had cleared.
October 26, 1882	9.9	5.0 (2 hours after)
November 18, 1882	9.6	5.0 (1½ ")
December 1, 1882	5.5	4.1 (4½ ")
" 20, 1882	8.1	5.2 (1½ ")
October 11, 1883	7.6	5.1 (5 ")
April 27, 1884	5.3	4.6 (2½ ")

Table II. contains 29 experiments, and the mean of all these is 7.2; the maximum, as above stated, being 14.1, and the minimum 4.7. With regard to the time of year when these 29 experiments were made—

7 were made in January.	3 were made in October.
3 " February.	2 " November.
1 " March.	9 " December.
4 " April.	

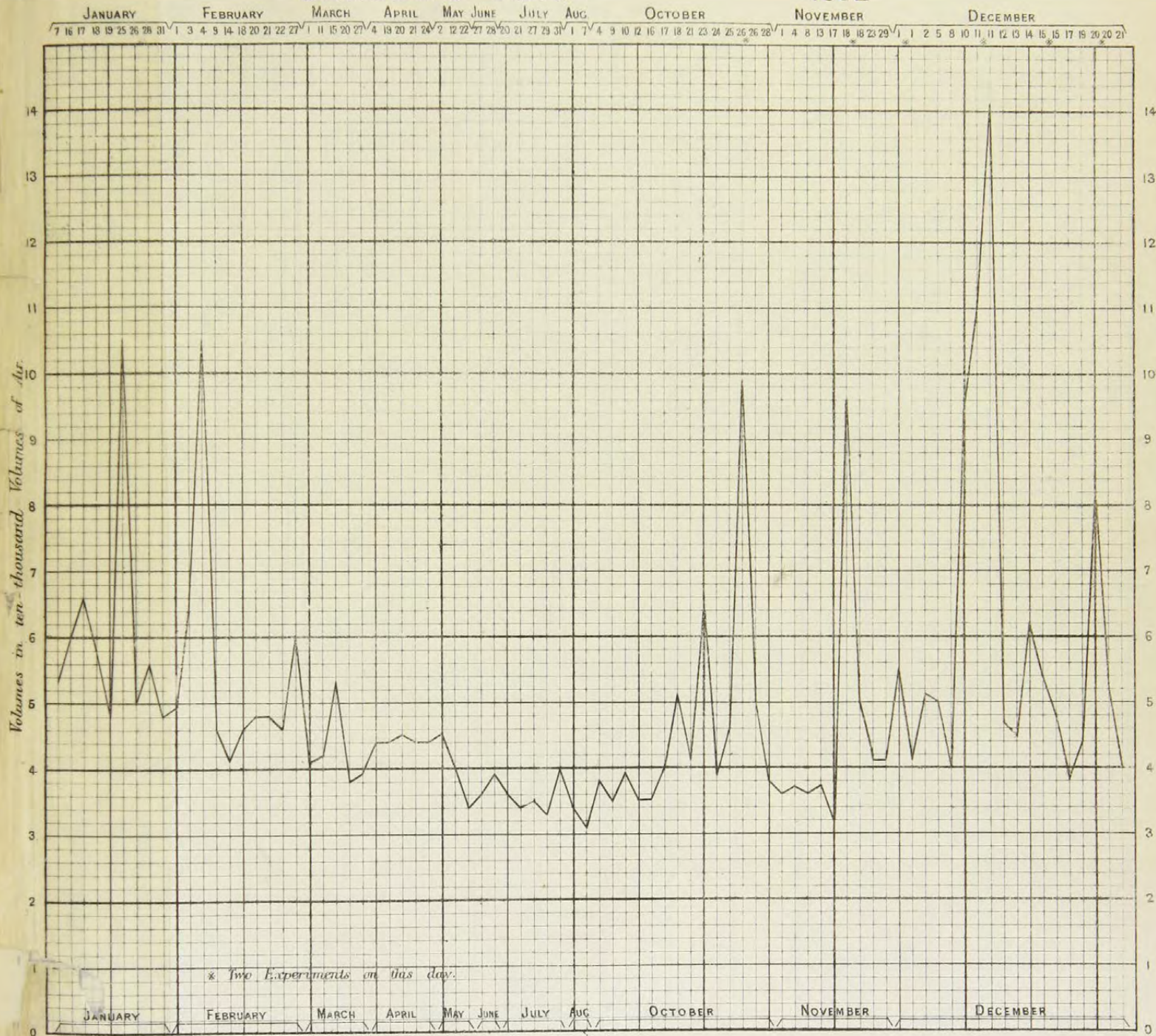
The above experiments certainly confirm the impression that the carbonic acid in a town air is a very important indication of its purity.





CARBONIC ACID

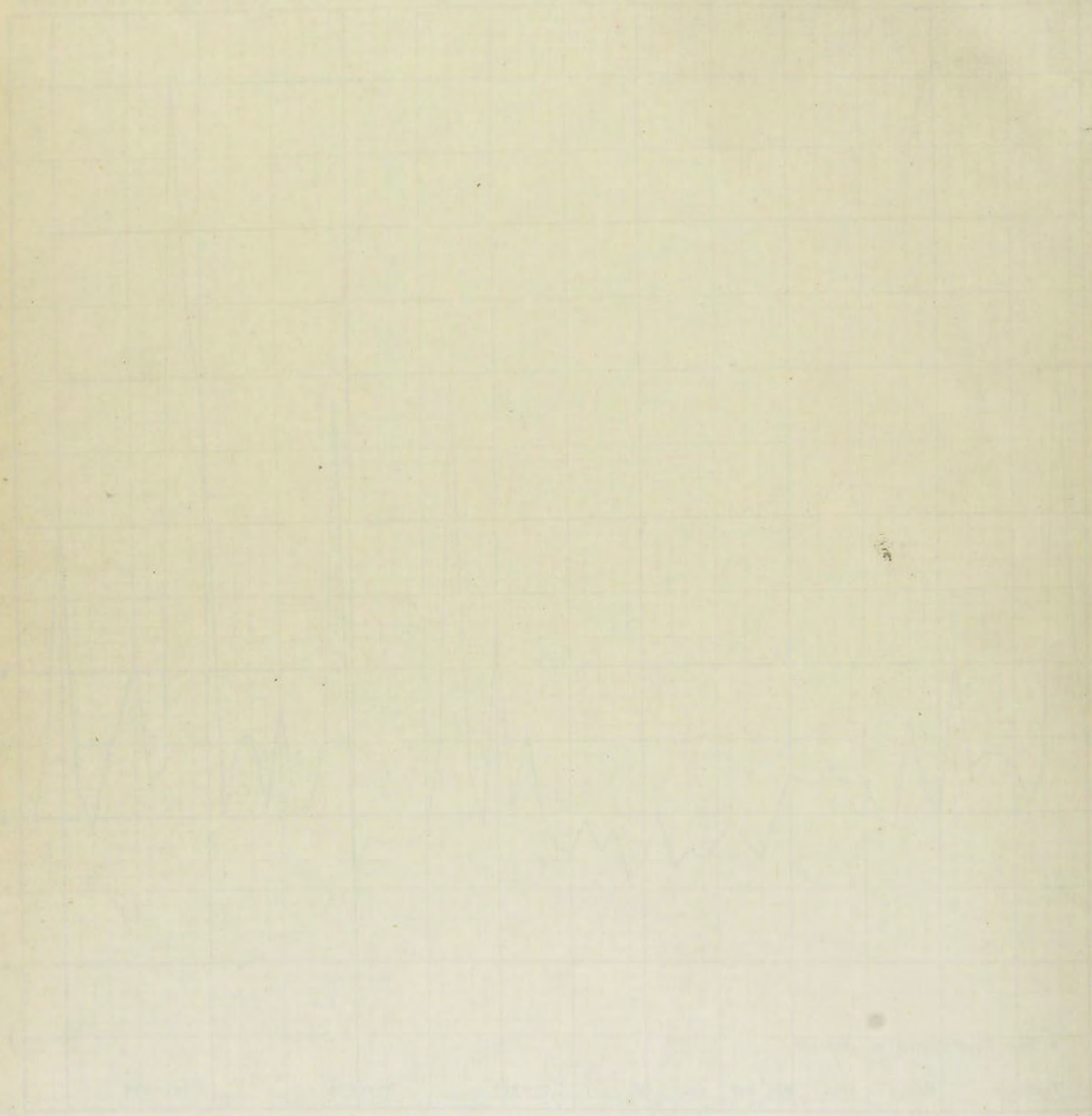
1882



Printed

1885

CARBONIC ACID



1883

CARBONIC ACID

1884

