

The Meteorological Magazine



Air Ministry :: Meteorological Office

Vol. 59

June
1924

No. 701

LONDON · PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE

To be purchased directly from H.M. STATIONERY OFFICE at the following addresses: IMPERIAL HOUSE, KINGSWAY, LONDON, W.C.2; 28, ABINGDON STREET, LONDON, S.W. 1; YORK STREET, MANCHESTER; 1, ST. ANDREW'S CRESCENT, CARDIFF; or 120, GEORGE STREET, EDINBURGH; or through any Bookseller.

The Magazine may also be purchased from THE METEOROLOGICAL OFFICE, SOUTH KENSINGTON, LONDON, S.W.7

World Weather*

By Lieut.-Col. E. GOLD, D.S.O., F.R.S.

DR. H. H. CLAYTON, Chief of the Forecast Department of the Argentine Weather Service, has been well known to meteorologists since he took charge of the expedition sent out in 1905 by Teisserenc de Bort and A. Lawrence Rotch to explore with kites the upper air over the Atlantic. His researches on the relations between solar conditions and the weather have been the subject of much discussion. It was therefore to be expected that his new book *World Weather*, would be fresh and interesting.

This book covers in fourteen chapters the whole range of meteorological science. It begins with an account of the forces controlling changes of the weather—proceeds to the simpler periodic changes—discusses temperature, pressure, wind and humidity. That takes eight chapters. Chapter nine treats of cyclones and anticyclones, “or storm and sunshine.” (I do not think we in north-west Europe can regard anticyclones so benevolently.) In these nine chapters the author shows himself acquainted with recent developments in meteorology and gives prominence to the contributions of Shaw, Dines, Simpson, Taylor, Bjerknes and Emden, and naturally also to the work of many American meteorologists, including Dr. Le Roy Meisinger,

* *World Weather*, including a discussion on The Influence of Variations of Solar Radiation on the Weather, and of The Meteorology of the Sun, by Henry Helm Clayton. (Macmillan & Co. Price 18s.)

whose recent untimely death at the post of duty we all deplore.

The effect of the earth's rotation on atmospheric motion which is fundamental in the meteorology of temperate latitudes, is considered at some length ; in this connection the author attributes to W. M. Davis and Clough results about the motion of a particle on a level surface, which were published forty years earlier by Sprung and re-published in 1910 by the Smithsonian Institute. One notes also on page 43 Thompson should be Thomson. (James Thomson was Lord Kelvin's brother.)

The "sea-breeze" is a phenomena whose magnitude in some tropical regions I had not appreciated until I read the author's graphical description, taken from Bowman, of the sea-breeze of Chile and Peru, which reaches gale force daily in certain regions. It may prove possible for "gliders" to make use of this.

The longest two chapters of the book are devoted to a consideration of the relation between solar radiation and the weather. They are of great interest : much information has been collected and discussed and the fact that Dr. Clayton has himself contributed materially to this subject, enables him to write with confidence about it. He realises that no simple direct universal connection can be found (or expected) between the intensity of solar radiation and the temperature or weather at a place. The effect of a change of solar radiation depends on the period for which the excess or defect lasts and it varies with latitude and altitude and with the situation of the region in relation to the "centres of action." He has, however, arrived at the general conclusion that the effect of solar changes in the temperate zones begins to be felt first in high latitudes, progresses eastward and equator-ward and dies out in low latitudes.

He has something to say on the vexed question of periodicities (with special reference to solar periodicities) and gives a good account of the relation between long period variations of pressure in different latitudes and the variation of sunspots—in the tropics pressure is high at sunspot minima and low at sunspot maxima. In connection with the 11-year period of sunspots and temperature one feels that a fuller reference than the simple mention of the author's name might have been made to Newcomb's investigation. Hale's researches are referred to in Chapter XIV., which treats of the meteorology of the sun, but presumably this book was in print before the announcement of the most recent results of the examination of the bi-polar spots and their changes in each new cycle which puts future investigators in so much more favourable a position for the discussion of this period in World Weather.

In a chapter on Forecasting the author gives an account of forecasting from weather maps and, what will be of much interest to European readers, an account of forecasting in Argentina

from accurate observations of the intensity of solar radiation. The results of the trial were naturally not uniformly successful, but the author considers that when full and accurate day to day values of solar radiation are available, forecasting, not merely for Argentina but also for Europe and other parts of the world, will be possible with an accuracy not heretofore thought possible. Whether we are convinced of this or no, we are convinced that the trial is worth making and that all possible support ought to be rendered to Professor Abbot and his colleagues in their efforts to get such accurate day to day values. There will certainly be more light in many dark places of meteorology when a long series of such values are available.

Reading a book like *World Weather* makes me reflect that we meteorologists are apt to "spread ourselves"; we do not confine our attention to a single definite aim but, infected by our subject, we are led into mazes from which it is difficult to extricate ourselves and more difficult for our readers to find light. Dr. Helm Clayton has something special to say about world weather and its relation to solar changes, and I am inclined to think that concentration on that aspect of meteorology would have produced a result more satisfying to the expert meteorologist; but the book might then have proved less useful to the ordinary reader.

Royal Meteorological Society

THE monthly meeting of the Society was held on Wednesday, May 21st, at 49, Cromwell Road, South Kensington, Capt. C. J. P. Cave, President, in the Chair.

Messrs. J. E. Clark, I. D. Margary and Richard Marshall.—Report on the Phenological Observations in the British Isles from December, 1922, to November, 1923.

The three "phenological reporters" are to be congratulated on the production of an excellent report. Three hundred and fifty-seven records were dealt with in all, showing a more than 50 per cent. increase of the records since 1922. Only those whose duty it has been to analyse large masses of figures can assess at its true value the virtue of those who carry through such tasks for love.

It is interesting to recall that during last June there was a severe drought which accentuated the already bad conditions among the garden and field crops. Mid-July heat and thunderstorms partly made the conditions more favourable and finally crops in the more advanced parts surpassed expectation though much under average. In the extreme north, however, there

were reports of hay rotting and crops uncut in December, whilst the unprecedented November frosts destroyed hundreds of acres of undug potatoes even in Lincolnshire, Yorkshire and Lancashire.

C. E. P. Brooks, M.Sc.—The distribution of Rainfall over Uganda with a note on Kenya Colony.

The results of rainfall measurements at 51 stations in and near Uganda, mainly during the period 1901 to 1920 are discussed. The amounts vary from 31 to 76 inches a year, the mean being about 50 inches. The proportion of the rain which falls in the different seasons is illustrated by four seasonal maps, and by a diagram of the percentage which falls in each month in different latitudes. There are two rainy seasons, falling near the equinoxes on the equator but tending to approach the June solstice a few degrees north and the December solstice a few degrees south, so that in each hemisphere most of the rain falls in the summer half-year, and the rainy season each year "follows the sun" from south to north of the country and back again. Tables give the average monthly and annual rainfall and number of rain-days, the heaviest falls in a day, and the greatest and least monthly and annual falls, at the stations with the longest records. In these respects Uganda rainfall is moderate; more than five inches in a day is rare, and the heaviest monthly fall recorded is 17.85 inches. A brief description is also given of the rainfall over Kenya Colony, with a map of the average annual fall.

Spencer C. Russell, LL.B., exhibited a diagram showing daily records of well levels at Chilgrove, Sussex, and Detling, Kent, during 1923. The prolonged effects of the drought of 1921 make the diagram of special interest.

Correspondence

To the Editor, *The Meteorological Magazine*

The Storm in Somerset, May 18th, 1924

A VERY heavy hailstorm was experienced here at 17h. G.M.T. to-day.

Thunder and lightning commenced at 13h. followed by very heavy rain, thunder and lightning until 16h. 30m., when the rain stopped and the sky cleared somewhat to the south-west though continuing very heavy to the north and east with occasional thunder and lightning in those directions. At 16h. 45m. Cu-Nb cloud covered the sky except towards the west, where the sun was shining through Ci-St cloud, though patches of Cu-Nb were also seen in that direction, and vivid lightning and heavy thunder were experienced.

At 16h. 55m. a strange noise, as of heavy surf breaking on a shore, together with a whistling sound as of a gale, was heard high overhead and in a few seconds heavy rain drops, about the size of pennies, began to fall and increased in number, followed by very heavy hail. The hailstones were mostly round, but a number of eccentric shapes were noted, some being almost square. The round ones, on measurement, were $\frac{5}{8}$ inch in diameter and the square ones $\frac{3}{4}$ inch square. The stones were white in the centre and coated with transparent ice on the outside. The hail was so heavy that objects at a distance of 150 yards were cut off from view as by a white sheet, whilst branches were broken off trees, and glass roofs smashed. The hailstorm lasted 10 minutes, followed by rain for about 5 minutes. The fields were white for some time; water rushed down any slopes, roads were flooded and from some fields the surface soil was carried down and silted up in ditches or against banks and hedges.

There was no wind at the surface either before or after the storm, thick ground mist being formed in low-lying ground.

S. N. PLUMMER.

Pratts Farm, North Petherton, Bridgewater, May 18th, 1924.

Looking along a Lightning Flash

MAY 8th, 1924, 4h. 45m., G.M.T. A brilliant flash of lightning, and before I could get my watch the violent crash of thunder had ceased. At the time I was at my window, and looking north-eastward exactly in line with the discharge, which seemed to me to have been immediately above a house not fifty yards distant. The one flash and its thunder crash constituted the entire storm.

Next morning I learned that a "bolt" had fallen on two houses; Nos. 34 and 35, Ventnor Villas were damaged, the latter seriously. Structural alterations of No. 35 were in progress, and Mr. Brown, the contractor, who had had 30 years of experience in the fire brigade, was present when the crash came, shortly before five o'clock was the nearest time he could give me. He laughed at the popular idea of a "bolt" having fallen. The flash of the lightning struck and fused the lead guttering on the north side of the house, pierced the wall, and on the inside split it downward into a room on the ground floor several steps above the pavement and street. It was in this room that the discharge took place, and such was the extraordinary manner in which the disruptive violence had exerted itself that Mr. Brown had never seen anything like it during his fire brigade service, the electricity, I should say, exercising its selective properties, destroying some things and leaving others untouched. About

one-half of the house was badly damaged, the whole of the chimney stack and cowls toppling over into the garden, a large area of the roof stripped, the north east angle of the house cut off, windows, a conservatory, and other things reduced to a mass of wreckage, and the neighbouring house, with the party wall in the side entrances separating them suffering considerable damage, but in neither building was any article set on fire. Strangely enough, although the families were in both houses, and the contractor and his men were leaving off work, no one suffered the slightest injury.

I think the main interest in it is the distance, 1 ml. 1 furlong, at which the explosion occurred, whereas a person making an estimate from his observation of the flash and the almost instantaneous crash of thunder would, like myself, guess it only just across the road, certainly less than 50 yards.

According to the *Sussex Daily News* two policemen said: "The lightning seemed to roll up in a ball and explode." My observation of the discharge was not that it was in the form of a globe, but looking upward, immediately above these Tennis Road houses, which are not 30 feet high, I saw close above me the underside of a brilliant disc from the circumference of which equally brilliant rays or shafts of light shot out. It is curious that for such a terrific crash there were no companion flashes, either preceding or following—it was a veritable bolt from nowhere, certainly not from the blue.

HY. HARRIES.

10, Tennis Road, Hove, Brighton, May 10th, 1924.

The Great Storm of May 31st, 1924

Rainfall at Ludlow, Salop

THE following figures relate to the intensities and quantities of rain which fell at Ludlow on the occasion of the great storm of Saturday night May 31st—June 1st. As I had no recording gauge I went to some trouble to take readings at short intervals, and the following forms a summary of the results.

The storm began at 7.57 p.m. on May 31st.

Time.	Quantity.	Total Time.	Total Quantity.
8.9 p.m. ..	0.65 inches	12 mins.	0.65 inches.
8.26 p.m. ..	0.63 "	29 "	1.28 "
8.36 p.m. ..	0.61 "	39 "	1.89 "
8.46 p.m. ..	0.30 "	49 "	2.19 "
8.57 p.m. ..	0.12 "	1 hr.	2.31 "
9.07 p.m. ..	0.12 "	70 mins.	2.43 "
9.57 p.m. ..	0.16 "	2 hrs.	2.59 "
10.27 p.m. ..	0.09 "	2½ hrs.	2.68 "
10.0 a.m. ..	1.63 "	14 hrs. 3 mins.	4.31 "
7.07 p.m. ..	0.52 "	23 hrs. 10 mins.	4.83 "
7.57 p.m. ..	nil.	24 hrs.	4.83 "

(NOTE.—The times are British Summer Time).

The greatest intensity occurred between 8.26 p.m. and 8.36 p.m., the fall of 0.61 inches during those 10 minutes being at the rate of 3.66 inches per hour.

The actual fall during the first hour of the storm amounted to 2.31 inches, and the 24 hours' total was 4.83 inches. The rainfall for the 31st May during the "official" hours ending 10 a.m. S.T. on 1st June amounted to 4.34 inches, made up of the 4.31 inches of the above table plus .03 inches, which fell previously between 10.0 a.m. and 7.57 p.m. on the 31st. This latter quantity represents a slight shower about midday on the 31st together with the commencement of the rain from 7.50 to 7.57 p.m.

The afternoon and evening had been exceedingly sultry and oppressive, and warning of the storm was indicated by thunder in the direction of Church Stretton, but even so the actual burst of rain came with alarming suddenness. Within seven minutes of the first few drops of rain at 7.50 p.m. the intensity had reached tropical proportions, and, as indicated by the above table, this rate continued unabated for 39 minutes. There was lightning and heavy thunder from 8.10 p.m. to 8.35 p.m., after which there was only one isolated crash of thunder at 8.44 p.m. Rain continued steadily throughout the night and next day, and did not cease till 7.5 p.m. on June 1st—representing $23\frac{1}{4}$ hours continuous fall.

The total figure for the "official" 24 hours was very fortunately checked by a second gauge which I emptied twice. At 10.27 p.m. this gauge showed 2.66 inches since 10.0 a.m. on the 31st (against $2.68 + 0.03 = 2.71$ inches) and at 10.0 a.m. on June 1st I found identical quantities in the two gauges, viz., 1.63 inches. Hence the second gauge gave 4.29 inches for the day as a check on the 4.34 inches of the first gauge.

The month's total which was only 3.57 inches up to 10.0 a.m. on the 31st was increased by this storm to 7.91 inches.

ALFRED A. BARNES, F.R.Met.Soc.

Roscrowden, Julian Rd., Ludlow, Salop, June 2nd, 1924.

Obituary

WE learn with deep regret of the death of Dr. C. Le Roy Meisinger and of his pilot Lieut. Neely during a thunderstorm which destroyed the balloon in which they were making observations over Bement, Illinois. They had been engaged in the series of flights for meteorological purposes which were described by Dr. Meisinger in the April number of the *Meteorological Magazine* and it is believed the balloon which exploded and burst into flames was struck by lightning.

NOTES AND QUERIES

Sir Gilbert T. Walker

It was announced in the list of Honours awarded on the occasion of the King's Birthday that a knighthood had been conferred on the retiring Director-General of Observatories, India. Dr. Walker, who had been Director-General for 20 years, retired in the middle of June.

India has been particularly fortunate in her meteorologists, for Walker followed Eliot, and Eliot followed Blanford, and these three have made her meteorological service one of the best in the world. As is well known, Sir Gilbert has been a pioneer in the application of mathematical methods to meteorological statistics, and has made the subject of seasonal forecasts by these methods particularly his own. During the twenty years he has been in India he has written nine papers for the *Indian Meteorological Memoirs* on the correlation between meteorological factors and seasonal variations of weather, necessitating the calculation of well over a thousand correlation coefficients. Walker would not claim to have solved the problem of forecasting the rainfall of the Indian Monsoon, but there is little doubt that he has pointed the path to the solution and has had no little success himself.

The twenty years that Dr. Walker has been in India have been particularly difficult, especially on the administrative side. The Indian Meteorological Department was at its high-water mark in 1908, when Dr. Walker had four Europeans under him in Simla, two at Kodaikanal, and three European part-time officers at Madras, Bombay and Calcutta. Slowly these have been replaced by Indians, and now there are only three Europeans in the whole department, including the new Director-General himself. The war, followed by general unrest in India and great financial stringency, has resulted in a marked curtailment of the work of the meteorological department during recent years.

G. C. S.

The New Director-General of Observatories, India

Mr. J. H. Field, who is to be the new Director-General of Observatories, went out to India in 1904 as one of the three Imperial Meteorologists appointed to the reorganised department under Dr. Walker. Mr. Field has specialised on the upper air, and we owe to him all the knowledge we possess of the atmospheric conditions in the free air over India. Working first with kites,

he determined the depth of the monsoon current near Karachi. Kites, however, proved very difficult to use in India, where there is either no wind at all, or high winds and rain associated with the monsoon. Mr. Field has remarkable mechanical ability and much resource. He soon developed methods for using sounding balloons in the peculiar conditions in India, and succeeded in reaching great heights. Unfortunately, owing to the difficulties of staff and money of recent years this work has only just been published.

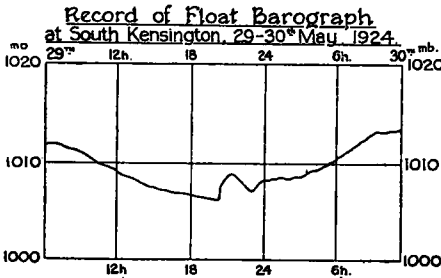
In consequence of the success of Mr. Field's preliminary work, the Aerological Observatory at Agra was established, and he was appointed Director. From 1912 to 1922 Mr. Field remained at Agra, but in the latter year he returned to Simla to help with the administration work at Headquarters, which was seriously affected by the loss of the European staff.

We wish Mr. Field all success in his new work.

G.C.S.

The Line Squall of May 29th, 1924

A WELL developed line squall passed across south-east England in the evening of May 29th. The first report of it was received at the Meteorological Office in a telegram from Ditcham Park,



Petersfield. The absence of rain during the early phase of the squall was a marked feature of the phenomenon. In London the rain and thunder came after the squall cloud had passed. The sequence of pressure and temperature changes were somewhat unusual suggest-

ing the temporary intrusion of a tongue of cold air and the resumption after an interval of two hours of the interrupted gradual change of pressure. The barogram for South Kensington is reproduced above.

The following notes on the passage of the squall have been contributed by different observers:—

East shore of Selsey Bill. Afternoon until about 17h. Dull threatening sky. Sultry air. Light wind from east.
17h.—17h. 45m. Continuing as above with some thunder from southwest and intermittent rain drops.
17h. 45m. Marked change in sky towards the southwest, a continuous bank of cloud, lighter in colour than the remaining sky, seen advancing from southwest.

17h. 50m. The bank of cloud quite near and stretching low down across the sky from southeast to northwest with peculiar irregular vertical breaks. As the cloud passed overhead continuous rain commenced and the wind veered to south, later to southwest. Rain increased. Wind force 5-6.

18h.—19h. Thunder and lightning towards south as storm passed in southerly direction and heavy rain continuing.

19h.—21h. Rain gradually lessening and wind northwest dying away. Sky clearing.

HAROLD NOTLEY.

Wembley Exhibition. At about 19h. 30m. I noticed very heavy Cu. Nb cloud coming up rapidly from the south. The zenith was very angry-looking but in the north and northeast the sky was only partly covered with Alto Cu. cloud. Suddenly it got as pitch as it could be and a furious wind got up and drove the dust in great rolling clouds over the Exhibition. The dust blotted out everything and then it suddenly lightened in the south and the darkness was not so great. Not a drop of rain fell and I observed one distant lightning flash. There was no thunder. The wind blew hard for some time and then at about 20h. it pelted with rain and continued on and off for about $1\frac{1}{2}$ hours.

J. E. COWPER.

Leytonstone. At 8h. 55m. when the sky was entirely overcast (very black clouds being to the south of Leytonstone), there suddenly appeared a large white circle in the clouds, travelling towards us and getting larger at a very rapid rate. It had passed over our heads within 30 seconds. With it came a high wind drawing up dust from the Wanstead Flats, 300 ft. or more, entirely hiding from view all trees, etc. In 5 minutes everything had cleared. Heavy rain followed.

A K. TURNER.

The "Worcester," Greenhithe. During the day, the wind was ENE, force 2-4, barometer falling steadily, warm and sunny.

7h. 35m. Wind ENE, force 3, dry bulb 61°F. , wet bulb 60°F. Cloud Ci.-Cu., Cu. & St. Sky quite overcast. Observed heavy Cu-Nb. clouds banking in the SW and travelling rapidly against wind from (roughly) SW to NE.

7h. 45m. Line squall front reached ship; wind suddenly came out of the south with force 10. For about three minutes this force was sustained, while a long line of cloud stretching from N by W to S by E (ends not visible) passed over. The cloud line was composed of several layers of cumulus and stratus, and very great turbulence, producing vortical "streamers" in the front, was noticed. The base of the clouds was about

1,500 feet high and they extended upwards to a great height. No rain.

7h. 48m. Brief calm. The line of clouds had passed over and given place to a "leaden"-coloured sky.

7h. 50m. Wind SW, force 5. Barometer commenced to rise. Heavy rain commenced.

8h. Thunder and lightning at intervals, continuing till about 10h.

8h. 15m. Dry bulb 56°F., wet bulb 55°F. Wind WSW, force 2. Heavy rain.

8h. 45m. Wind WSW, force 1. Steady rain.

9h. 30m. Slight rain. Wind S., force 2.

11h. Rain ceased. Light airs. Overcast.

CLEEVE E. CLOWSER.

The Meteorological Office Exhibit at Wembley

THE British Empire Exhibition at Wembley was opened by H.M. the King, on April 23rd, with all the pomp and ceremony befitting such an occasion. Unfortunately, the brilliance of the spectacle was somewhat marred by the gloominess of the weather, the sun being obscured by low cloud during the whole ceremony.

The apparent preparedness of the greater part of the Exhibition on the morning of the 23rd was a surprise to those who had visited the grounds only a few days previously. Gardens and trees seemed to have grown up in the night as if by magic, more especially so in the vicinity of H.M. Government Pavilion. In the less conspicuous parts of the grounds, however, there was still much to be done and the annexe to the Government Pavilion in which, according to the official guide, the meteorological exhibit was said to be housed, was still in a state of incompleteness. For reasons over which the Meteorological Office had no control, three weeks elapsed before this part of the building was opened to the public. The entrance to the meteorological section is to be found at the back of the Government Pavilion. It is self-contained, and the walls are hung with specially prepared diagrams illustrating the work of the Office with regard to Weather Forecasting, Climatology, Marine Meteorology, Upper Air Investigations and British Rainfall. Numerous instruments used in meteorological work are on view, amongst these being a Dines Pressure Tube Anemograph, which gives a continuous record of the speed and direction of the wind over the building. There is also an Autographic Rain Gauge to show the intensity of rainfall. In a glass bell is exhibited a specimen of a Balloon Meteorograph, together with a large working model of the same

instrument. [So reliable is this instrument in use that in spite of its small size, it can record temperature without an error of more than one degree centigrade, and pressure to within a few millimetres of mercury. The record is inscribed on a small piece of silvered plate about the size of a postage stamp and has to be deciphered by the aid of a microscope].

The preparation of forecasts is demonstrated by members of the Meteorological Office Staff who are on duty there. By means of a wireless installation, data from a great part of the Northern Hemisphere are collected. These are plotted on weather maps and deductions are drawn regarding the coming weather. Two large weather charts, each measuring 10 feet by 9 feet are to be seen in the main building near the front entrance, one of the western part of Europe and the other of a large part of the Northern Hemisphere extending from America to Russia. The chart for western Europe is drawn twice daily, for 7h. and for 13h., and that for the Northern Hemisphere once daily, so that visitors may see the current meteorological situation and at the same time realise the rapidity with which meteorological data are collected from very wide areas.

On May 14th, Their Majesties the King and Queen, accompanied by Their Majesties the King and Queen of Roumania, honoured the Meteorological Section with a visit. The Royal Party were received by Dr. G. C. Simpson, C.B.E., F.R.S., Director of the Meteorological Office, and inspected the exhibit with much interest. The King was particularly interested in the current weather map and in the meteorological log which was kept on board H.M.S. "Thrush," when His Majesty, as Prince George, was in command of that vessel. His Majesty immediately recalled the name of the officer who was responsible for the entries.

Judging from the interest shown by the numerous visitors who inspect the exhibit it would appear that the importance of meteorology is being increasingly recognised by the general public.

Like a Thief in the Night

ON April 14th a cow was found dead at Shenfield Place, near Brentwood, Essex, and a post-mortem examination by a veterinary surgeon showed that the death was caused by lightning. A policeman on duty in Brentwood, a mile away, reported that it rained heavily between 3 a.m. and 3.30 and that he heard rumblings which sounded like thunder, but there is no other evidence for the thunderstorm, which must have been very local and very brief. We have to thank Mr. H. P. Landon for these details.

Weather Conditions in the Polar Regions and Amundsen's Polar Flight

IN the *Tidens Tegn* for March 1st, 1924, there was an account of the weather conditions in the north polar region, written by Dr. Hesselberg in view of Amundsen's proposed polar flight. Much valuable information is available from Jan Mayen Island, Bear Island and Spitsbergen, where Norway has permanent meteorological stations, and observations on other islands have been made by the different expeditions to the Arctic; those taken of the *Fram* expedition (1894-1896) form the most complete series and have been used for this article.

Dr. Hesselberg points out that the maximum wind velocity recorded on the *Fram* during any of the months, May, June and July was 15.5 m/s and that therefore the wind conditions do not constitute more of a hindrance than those in our own latitudes. Over the polar seas temperature rises rapidly during May. In June and July the temperature varies but slightly from the freezing point, and it is only the presence of ice which prevents it from rising still higher. Fog, however, is prevalent in the polar regions in the summer and it is this factor, and neither the cold nor the wind, which makes flying so difficult. The fog lies rather low so that there is no difficulty in flying above it, but a forced landing in a sea of fog might easily have fatal consequences. During the winter when the temperature and wind conditions make flying practically impossible there is little or no fog, but it makes its appearance in May and increases in frequency until the middle of July. The longest consecutive periods during which the *Fram* was surrounded with fog were 12 hours in May, 46 hours in June and 71 hours in July.

It is therefore very necessary that Amundsen should make his start as early in the year as possible and that the best measures should be taken to insure him as far as possible from running into unfavourable weather conditions which may occur even at the most favourable period of the year. Weather reports from as many stations as possible within the Arctic circle, from the Norwegian stations at Jan Mayen, Bear Island, Spitzbergen and Vardo, from Nome (Alaska) and from certain stations on the Russian and Siberian Arctic coast, will be sent to him. Dr. Hesselberg considers that reliance should not be placed on reports from the *Maud*, as there is some doubt as to the capabilities of her wireless outfit.

In justification of such a flight he points out that the weather conditions in the Polar regions have a great influence over the weather of the rest of the globe. A single flight will not provide information of great value, but it will open the way for a regular service of meteorological observations.

The Air-Waves from the Explosions at La Courtine

THE explosions arranged at La Courtine in Central France for May 15th, May 23rd and May 25th were carried out according to programme. On the first occasion conditions were very favourable in England as there was hardly any wind. A certain number of observers sent reports to the Meteorological Office to the effect that they had heard noises near the appropriate times but it is doubtful whether any of these can be attributed to the explosion. The sound-ranging stations obtained negative results. On the other hand, Mr. A. Edwards, observing at the Beckton Office of the Gas, Light and Coke Company with a micro-baroscope (made by fitting a T-piece in the mouth of a thermos flask and inserting a drop of oil in one branch) found evidence of air waves at 7.48 p.m. and 8.11 p.m. summer time. The explosion occurred at 7.30 p.m.

On May 23rd and also on May 25th the weather was rough. On May 23rd Mr. Edwards was again the most successful observer recording air waves at 8.32 p.m. and 8.39 p.m. (the explosion being timed for 8.0 p.m.). On the 25th Mr. J. J. Darling, working at University College, Dublin, with a hot wire anemometer obtained an indication of the third explosion at 9.58 a.m. If this observation is valid the air wave must have persisted for no less than 58 minutes.

It is of interest to note that Mr. H. Deslandres reports* that at Meudon, near Paris, not one of the three explosions was audible but that on the first two occasions trains of waves were recorded by a microphone arrangement. Wind interfered with observations on the 25th.

International Meetings

THE Report of the International Meteorological Conference of Directors and of the Meeting of the International Meteorological Committee at Utrecht, September, 1923, has been issued as publication No. 112 of the Koninklijk Nederlandsch Meteorologisch Instituut. The proceedings of the Conference were fully described in the *Meteorological Magazine* for October, 1923. We may note here that amongst the Appendices to the full Report are to be found some short papers of general interest. Appendix H contains the preliminary report on the audibility of the Oldebroek explosion, Appendix L an instructive discussion of reduction of pressure to sea level (it being shown that for a high station in Norway the rule hitherto recommended by international convention serves well enough in summer but that in winter it does not give consistent results). Appendix O, con-

* *Comptes Rendus*. Tome 178. May 26th and June 2nd, 1924.

tributed by Professor Exner, is concerned with the correlation of weather anomalies in different parts of the world, and includes a map showing for December to what extent pressure in other regions is correlated with that in Iceland.

Observatory Reports for 1923

FROM Falmouth Observatory we have received the Meteorological Notes and Tables for the year 1923. Full use has been made of the old records of the Observatory in the interesting comparisons between 1923 and earlier years.

The meteorological observations made at the Radcliffe Observatory, Oxford, during 1923, have also been published. Attention may be called to the fact that Oxford is the only place in the Home Counties for which the daily observations are published so promptly in a single report.* Anyone who wants to know the weather of a year ago, say on June 17th, 1923, can look it up for Oxford—9 hours of sunshine and light winds from the north.

The uninitiated may be puzzled by the temperatures that are published. On page 47 the maximum "shade" temperature for June is given as 75·8 on the 29th; on page 59, the temperature "highest in air" is said to have been 74·4 at 17h. 30m. on the same day. We understand that 75·8 was the reading of a maximum thermometer in the Stevenson screen, 74·4 the reading from the photo-thermogram which gives the temperature in a screen on the north or shady side of the stone building. May we express the hope that the distinction will be indicated in future in every monthly table?

Sunlight and Health

A MEETING was held at Carnegie House Hall, London, on Wednesday, May 14th, 1924, to inaugurate The Sunlight League. It is understood that the idea and the name are both due to Miss May Scanlan. The objects of the League are "To form and direct public opinion as to the value of Sunlight for life and health and the prevention and treatment of disease, and to support and co-operate with all existing agencies such as Health Societies, Schools, etc., that approve of this object." The League has for Presidents the Duke of Sutherland and Dr. Theobald A. Palm whilst Dr. C. W. Saleeby acts as Chairman of Council. The offices are at 20, Park Crescent, W. 1. Some instructive pamphlets by Dr. Saleeby have been issued already.

* The Greenwich observations for the twelve months ending with October, 1923, are printed in Whittaker's Almanac for 1924.

The Advisory Committee on Atmospheric Pollution

THE ninth report of the Advisory Committee on Atmospheric Pollution has recently been published. In addition to statistics covering the year ending March 31st, 1923, the report contains accounts of various interesting investigations. One curious fact may be picked out as significant and easy to remember. A comparison between the records obtained with the automatic filter and with the jet dust counter shows that the total amount of dust in the air is proportional to the number of individual particles, 10,000 particles per cubic centimetre yielding 1 milligramme per cubic metre, so that the average mass of a dust particle is 10^{-13} gramme and moreover this average persists whether the particles be many or few. The conclusion is probably sound, but it must be remembered that the weight is not determined directly, all we have to go on is the shade of the deposit on the paper of the automatic filter. The report shows that a good start has been made in the direct attack on the determination of the relation between visibility and the amount of dust in the air. Special apparatus has had to be designed so as to make the specification of the loss of light in a particular observation as straightforward as possible and so facilitate numerical comparisons. The Report is to be obtained from H.M. Stationery Office, Imperial House, Kingsway, London, W.C. 2. Price 4s. 6d. Net.

Records of Atmospheric Pollution

ARRANGEMENTS have been made by the Advisory Committee on Atmospheric Pollution for the circulation, month by month, of abstracts of the records from deposit gauges in anticipation of the full tables published in the Annual Report of the Committee. The statement for April shows some remarkable variations. In the centre of Liverpool the deposit amounted to 34 grammes per square metre (say an ounce per square yard), whereas on the outskirts of Southport the deposit was only 2 grammes per square metre. In the City of London it was $13\frac{1}{2}$ grammes per square metre. Copies of the Abstracts may be obtained from the Secretary of the Atmospheric Pollution Committee, 47, Victoria Street, S.W. 1.

News in Brief

THE Radcliffe Trustees have appointed Mr. Harold Knox Shaw (of Trinity College, Cambridge, Director of the Observatory at Helwan, Egypt) to be Radcliffe Observer, as successor to the late Dr. A. A. Rambaut. Mr. Shaw regards himself mainly as an astronomer but he has made valuable contributions to meteorology notably in connection with the study of Solar Radiation.

Since June 1st telegraphic reports have been received by the Meteorological Office of observations made at Harrogate at the hours appropriate for the maps of the Daily Weather Report. Hitherto inland information from the north of England has hardly been adequate for the needs of the Forecast Service. Responsibility for the observations at Harrogate has been accepted by the Corporation, who have maintained a climatological station for many years.

The meeting of the British Association for the Advancement of Science will be held this year at Toronto, August 6th—13th. Arrangements have been made for a number of papers, by both American and British meteorologists.

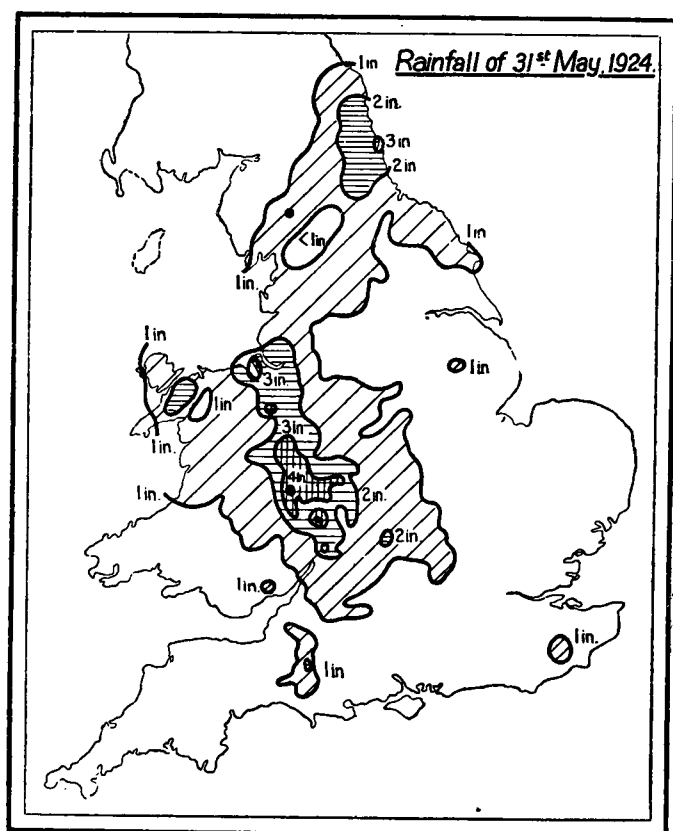
The report of the Conference held at Birkbeck College on January 3rd, 1924, between the Royal Meteorological Society, the Geographical Association and the Science Masters' Association has been published this month by Messrs. G. Philip & Sons, 32, Fleet Street, London, E.C. 4. Price 1s. 6d. net.

At the beginning of the year 1924, considerable changes were made in the Austrian Daily Weather Report. The most striking of the new features are maps showing the distribution of cloud, temperature and wind over Austria, on the comparatively large scale of 60 miles to the inch, and the distribution of pressure over Europe, the Atlantic and North America on a small scale. To judge by the reports for March, enough information is available to complete the latter map about every other day.

The Weather of May, 1924

THE most noteworthy features of the month were the repeated heavy falls of rain and the frequent occurrence of thunder. At the beginning of the month a belt of low pressure extended across the British Isles, but on the 3rd a northerly wind current began to spread south from the Arctic Ocean and thunderstorms with heavy rain were experienced in southern England. At a few places, notably Bristol and Stansted, Essex, the storms of May 3rd, though of short duration, were of great severity. Temperature fell appreciably on the 4th and for some days maxima remained well below 60°F. in England while snow or sleet fell in parts of northern England and Scotland. Shade temperatures below 32°F. were recorded at a few places in Scotland and Ireland and ground frosts occurred in many parts of the country, the exposed thermometer at Renfrew on the 9th reading as low as 18°F. From the 5th to the 16th sunny and rainy periods alternated owing to the repeated passage of depressions and secondaries from the Atlantic across the British Isles. Thunderstorms occurred in London and neighbouring counties in the early hours

of the 14th but during the day conditions improved and for the first time in the month temperature exceeded 70°F. locally; 78°F. was registered at Norwich and at Sheerness. After this until the end of the month night temperatures were generally well above the average for the time of year, but day temperatures were very unequal; 75°F. was, however, again exceeded on the 19th, 28th and 29th.



On the 17th an anticyclone passed across England but unsettled conditions were renewed subsequently. Thunderstorms were general in southern England and the Midlands on the 18th, 19th and 20th. Those which occurred on the 19th and 20th were accompanied in some cases by sudden short heavy falls of rain which caused considerable flooding and damage to crops in Bedfordshire, Hertfordshire, Buckinghamshire, Essex and Suffolk. In the latter county lightning also caused much damage to property. At Berkhamsted 34 mm. (1.34 ins.) fell in 35 mins. Mr. T. S. Wheater, the observer, writes that "About 5 p.m. heavy clouds seemed to come from both west and north-east and at 5.20 there was violent rain, thunder and lightning

with hail lasting till 5.55. Not more than .04 ins. fell before 5.20. At 5.55 I measured 1.39 ins. and at 10 a.m. on the 20th the total for 24 hours was 1.41 ins. The hail was about the size of marbles. It broke the glass of garden frames and cut through rhubarb leaves and pitted the fairways of the golf course. Some of the hailstones had the appearance of an elongated acid drop with an extra marble shaped stone attached. I measured the length—three-quarters of an inch. These cottage loaf specimens were lying amongst the marble-shaped hailstones. Thunder was heard from 2.30 till about 6 p.m.: our particular storm lasted from 5.15 till 6." At Stroud 36 mm. (1.43 ins.) fell between noon and 6 p.m. and at Cheltenham 35 mm. (1.37 ins.) between 4 and 5. On the 20th the heaviest falls were reported from Woburn (Bedfordshire) and Benson, 27 mm. (1.06 ins.) being recorded in 20 mins. and 18 mins. respectively.

From the 20th to the end of the month the weather continued unsettled, the most noteworthy disturbances occurring on the 29th and 31st. On the former date a line squall swept across southern England accompanied by widespread thunderstorms and darkness and on the later date the passage of a depression over England was marked by the heaviest rainfall of the month.

The map (p. 118) giving the rainfall during the 24 hours from 10 a.m. on Saturday, May 31st, shows that the principal area with more than an inch of rain up to that time reached from Bristol and London to the Irish Sea and was connected through Westmoreland with the north-east coast, whilst falls exceeding 3 ins. occurred between Shrewsbury and Great Malvern, on the Wirral and round Sunderland and Tynemouth. Floods occurred in Worcestershire, Shropshire, Herefordshire and round Sunderland. Rain began in the early hours of Saturday in Sunderland and continued for about 36 hours. It came from the north-east mainly and was accompanied by a strong wind. In the western Midlands the rain did not commence until Saturday evening and most of the fall was over before 9h. the following morning. The most remarkable fall occurred at Humber Rectory, Leominster, where 76 mm. (3 ins.) out of a total amount of 95 mm. (3.75 ins.) were experienced in $1\frac{3}{4}$ hours. At Durham the amount for the 31st 70 mm. (2.76 ins.) has only been exceeded there once (on November 13th, 1901) in 83 years. The biggest fall in the 24 hours reported by any regular observer for the Meteorological Office, however, occurred at Ludlow, 123 mm., and an account of that storm will be found on p. 106.

These heavy falls brought the totals for the month far beyond the average. At Seathwaite the total was over 400 mm. (16 ins.) at Talymaer (Brecon) over 250 mm. (10 ins.), and at Cheltenham, Blundellsands (Lancaster) and Ross-on-Wye the totals 179 mm., 140 mm. and 123 mm. were the largest May rainfalls at these places since 1866, 1876 and 1886 respectively.

Rainfall: May, 1924: England and Wales.

CO.	STATION.	In.	mm.	Per- cent. of Av.	CO.	STATION.	In.	mm.	Per- cent. of Av.
<i>Lond.</i>	Camden Square.....	3.14	80	178	<i>War.</i>	Birmingham, Edgbaston	4.95	126	231
<i>Sur.</i>	Reigate, Hartswood...	3.64	93	214	<i>Leics</i>	Leicester Town Hall...	3.69	94	...
<i>Kent.</i>	Tenterden, View Tower	5.54	141	353	"	Belvoir Castle.....	3.58	91	170
"	Folkestone, Boro. San.	2.64	67	...	<i>Rut.</i>	Ridlington.....	3.23	82	...
"	Broadstairs.....	3.10	79	187	<i>Linc.</i>	Boston, Skirbeck.....	2.93	74	166
"	Sevenoaks, Speldhurst.	3.45	88	...	"	Lincoln, Sessions House	2.30	58	123
<i>Sus.</i>	Patching Farm.....	3.91	99	211	"	Skegness, Estate Office.	2.66	67	156
"	Eastbourne, Wilm. Sq.	2.83	72	170	"	Louth, Westgate.....	2.50	63	123
"	Tottingworth Park....	4.93	125	274	"	Brigg.....	2.64	67	141
<i>Hants</i>	Totland Bay, Aston...	3.34	85	193	<i>Notts.</i>	Worksop, Hodsock....	2.43	62	122
"	Fordingbridge, Oaklands	4.57	116	220	<i>Derby</i>	Mickleover, Clyde Ho..	3.80	97	193
"	Portsmouth, Vic. Park	2.92	74	174	"	Buxton, Devon. Hos...	5.29	134	171
"	Ovington Rectory....	4.37	111	201	<i>Ches.</i>	Runcorn, Weston Pt...	5.80	147	251
"	Grayshott.....	4.88	124	227	"	Nantwich, Dorfold Hall	5.38	137	...
<i>Berks</i>	Wellington College...	4.11	104	221	<i>Lancs</i>	Bolton, Queen's Park..	5.75	146	...
"	Newbury, Greenham...	4.82	122	256	"	Stonyhurst College....	6.80	173	239
<i>Herts.</i>	Bennington House....				"	Southport, Hesketh...	5.22	133	250
<i>Bucks</i>	High Wycombe.....	3.86	98	219	"	Lancaster, Strathspey.	6.49	165	...
<i>Oxf.</i>	Oxford, Mag. College..	4.30	109	240	<i>Yorks</i>	Sedburgh, Akay.....	9.23	234	288
<i>Nor.</i>	Pitsford, Sedgebrook..	3.95	100	207	"	Wath-upon-Deane...	3.01	77	148
"	Eye, Northolm.....	3.50	89	...	"	Bradford, Lister Pk...	4.65	118	222
<i>Beds.</i>	Woburn, Crawley Mill.				"	Oughtershaw Hall....	8.45	215	...
<i>Cam.</i>	Cambridge, Bot. Gdns.	3.75	95	213	"	Wetherby, Ribston H..	4.74	120	229
<i>Essex</i>	Chelmsford, County Lab	4.49	114	...	"	Hull, Pearson Park...	3.07	78	159
"	Lexden, Hill House...	3.56	90	...	"	Holme-on-Spalding...	3.68	93	...
<i>Suff.</i>	Hawkedon Rectory....	4.50	114	243	"	Lowthorpe, The Elms.	3.17	81	163
"	Haughley House.....	3.96	101	...	"	West Witton, Ivy Ho..	5.64	143	...
<i>Norf.</i>	Beccles, Geldeston....	4.15	105	234	"	Pickering, Hungate...	4.13	105	...
"	Norwich, Eaton.....	3.85	98	199	"	Middlesbrough.....	3.82	97	199
"	Blakeney.....	3.60	91	228	"	Baldersdale, Hury Res.	...	...	...
"	Swaffham.....	2.59	66	148	<i>Durh.</i>	Ushaw College.....	6.40	163	296
<i>Wilts.</i>	Devizes, Highclere....	5.24	133	289	<i>Nor.</i>	Newcastle, Town Moor.	7.07	180	348
<i>Dor.</i>	Evershot, Melbury Ho.	6.77	172	332	"	Bellingham Manor....	3.95	100	...
"	Weymouth, Westham...	4.21	107	260	"	Lilburn Tower Gdns...	4.68	119	...
"	Shaftesbury, Abbey Ho.	4.11	104	195	<i>Cumb</i>	Penrith, Newton Rigg.	...	...	...
<i>Devon</i>	Plymouth, The Hoe....	4.60	117	223	"	Carlisle, Scaleby Hall	3.76	95	157
"	Polapit Tamar.....	3.15	80	156	"	Seathwaite.....	10.12	257	137
"	Ashburton, Druid Ho..	6.92	176	258	<i>Glam.</i>	Cardiff, Ely P. Stn....	4.38	111	175
"	Cullompton.....	4.18	106	194	"	Treherbert, Tynywaun	6.80	173	...
"	Sidmouth, Sidmount...	4.37	111	223	<i>Carm</i>	Cardmarthen Friary...	3.89	99	141
"	Filleigh, Castle Hill...	5.18	132	...	"	Llanwrda, Dolaucothy.	6.61	168	196
"	Hartland Abbey.....	2.51	64	...	<i>Pemb</i>	Haverfordwest, Portf'd			
<i>Corn.</i>	Redruth, Trewirgie....	3.45	87	149	<i>Card.</i>	Gogerddan.....	5.13	130	194
"	Penzance, Morrab Gdn.	2.47	63	112	"	Cardigan, County Sch.	3.70	94	...
"	St. Austell, Trevarna...	4.49	114	185	<i>Brec.</i>	Crickhowell, Talymaes	10.00	254	...
<i>Soms</i>	Chewton Mendip.....	6.73	171	244	<i>Rad.</i>	Birm. W. W. Tyrmynydd	6.08	154	177
"	Street, Hind Hayes...	4.02	102	...	<i>Mont.</i>	Lake Vyrnwy.....	8.14	207	258
<i>Glos.</i>	Clifton College.....	4.31	109	205	<i>Denb.</i>	Llangynhafal.....	4.11	104	...
"	Cirencester.....	7.01	178	330	<i>Mer.</i>	Dolgelly, Bryntirion..	6.55	166	198
<i>Here.</i>	Ross, County Obsy....	4.85	123	228	<i>Carn.</i>	Llandudno.....	4.38	111	230
"	Ledbury, Underdown...	6.01	153	294	"	Snowdon, L. Llydaw 9	18.37	467	...
<i>Salop</i>	Church Stretton.....	6.51	165	252	<i>Ang.</i>	Holyhead, Salt Island.	4.76	121	243
"	Shifnal, Hatton Grange	4.31	109	209	"	Lligwy.....	5.33	135	...
<i>Staff.</i>	Teau, The Heath Ho...	4.07	103	189	<i>Isle of Man</i>				
<i>Worc.</i>	Ombersley, Holt Lock.	5.82	148	284		Douglas, Boro' Cem...	5.11	130	202
"	Blockley, Upton Wold.	7.20	183	335	<i>Guernsey</i>				
<i>War.</i>	Farnborough.....	6.15	156	274		St. Peter Port Grange.	2.88	73	169

Rainfall: May, 1924: Scotland and Ireland

CO.	STATION	In.	mm.	Per- cent. of Av.	CO.	STATION.	In.	mm.	Per- cent. of Av.
<i>Wigt.</i>	Stoneykirk, Ardwell Ho	3.31	84	132	<i>Suth.</i>	Melvich School.....	2.36	60	115
"	Pt. William, Monreith.	3.31	84	...	<i>Caith.</i>	Loch More, Achfary...	3.60	91	82
<i>Kirk.</i>	Carsphairn, Shiel.	4.99	127	...	"	Wick	2.30	58	111
"	Dumfries, Cargen.....	4.68	119	155	<i>Ork.</i>	Pomona, Deerness....	1.96	50	98
<i>Dum.</i>	Drumlanrig	4.45	113	170	<i>Shet.</i>	Lerwick	3.32	84	159
<i>Roxb.</i>	Branxholme	3.61	92	160	<i>Cork.</i>	Caheragh Rectory....	3.54	90	...
<i>Selk.</i>	Ettrick Manse	5.79	147	...	"	Dunmanway Rectory.	3.64	93	107
<i>Berk.</i>	Marchmont House	5.44	138	220	"	Ballinacurra	3.50	89	148
<i>Hadd.</i>	North Berwick Res....	4.46	113	224	"	Glanmire, Lota Lo. ...	3.89	99	159
<i>Midl.</i>	Edinburgh, Roy. Obs..	4.46	113	255	<i>Kerry</i>	Valencia Obsy.	3.59	91	113
<i>Lan.</i>	Biggar	3.25	83	162	"	Gearahameen	6.10	155	...
<i>Ayr.</i>	Kilmarnock, Agric. C.	4.64	118	201	"	Killarney Asylum....	3.90	99	127
"	Girvan, Pinmore	3.45	88	116	"	Darrynane Abbey ....	...	...	...
<i>Renf.</i>	Glasgow, Queen's Pk..	4.00	102	164	<i>Wat.</i>	Waterford, Brook Lo..	2.82	72	122
"	Greenock, Prospect H..	5.12	130	148	<i>Tip.</i>	Nenagh, Cas. Lough...	3.10	79	126
<i>Bute.</i>	Rothsay, Ardenraig ..	4.67	119	154	"	Tipperary	4.58	116	...
"	Dougarie Lodge	5.31	135	...	"	Cashel, Ballinamona ..	3.61	92	150
<i>Arg.</i>	Glen Etive .....	...	...	...	<i>Lim.</i>	Foynes, Coolnanes	3.07	78	132
"	Oban	3.69	94	...	"	Castleconnell Rec.	5.05	128	...
"	Poltalloch	3.96	101	137	<i>Clare</i>	Inagh, Mount Callan ..	5.59	142	...
"	Inveraray Castle	4.27	109	109	"	Broadford, Hurdlest'n.	4.38	111	...
"	Islay, Eallabus	5.56	141	210	<i>Wexf.</i>	Newtownbarry	3.90	99	...
"	Mull, Benmore	7.60	193	...	"	Gorey, Courtown Ho...	3.47	88	156
<i>Kinr.</i>	Loch Leven Sluice	4.78	121	196	<i>Kilk.</i>	Kilkenny Castle	3.19	81	144
<i>Perth</i>	Loch Dhu	7.15	182	159	<i>Wic.</i>	Rathnew, Clonmannon ..	3.38	86	...
"	Balquhiddel, Stronvar.	5.88	149	146	<i>Cars.</i>	Hacketstown Rectory.	3.99	101	153
"	Crieff, Strathearn Hyd.	6.16	157	247	<i>QCo.</i>	Blandsfort House .....	...	...	...
"	Blair Castle Gardens ..	2.98	76	...	"	Mountmellick	3.87	98	...
"	Coupar Angus School ..	4.79	122	197	<i>KCo.</i>	Birr Castle	4.26	108	191
<i>Forf.</i>	Dundee, E. Necropolis.	4.40	112	211	<i>Dubl.</i>	Dublin, Fitz Wm. Sq..	2.55	65	124
"	Pearsie House	6.13	156	...	"	Balbriggan, Ardgillan ..	3.19	81	153
"	Montrose, Sunnyside ..	3.77	96	185	<i>Me'th</i>	Drogheda, Mornington ..	2.60	66	...
<i>Aber.</i>	Braemar Bank	3.68	93	154	<i>W.M</i>	Mullingar, Belvedere ..	3.66	93	149
"	Logie Coldstone Sch. ...	4.23	107	170	<i>Long</i>	Castle Forbes Gdns. ...	4.01	102	155
"	Aberdeen, Cranford Ho	5.93	151	239	<i>Gal.</i>	Galway, Waterdale ...	...	...	...
"	Fyvie Castle	5.11	130	...	"	Ballynahinch Castle ..	7.26	184	...
<i>Mor.</i>	Gordon Castle	3.51	89	166	<i>Mayo</i>	Mallaranny	7.51	191	...
"	Grantown-on-Spey....	3.27	83	140	"	Westport House	5.31	135	186
<i>Na.</i>	Nairn, Delnies	2.56	65	142	"	Delphi Lodge	8.60	218	...
<i>Inv.</i>	Ben Alder Lodge	3.74	95	...	<i>Sligo</i>	Markree Obsy.	5.83	148	213
"	Kingussie, The Birches	3.15	80	...	<i>Ferm</i>	Enniskillen, Portora ..	5.49	139	...
"	Fort Augustus	3.86	98	162	<i>Arm.</i>	Armagh Obsy.	4.09	104	172
"	Loch Quoich, Loan....	5.00	127	...	<i>Down</i>	Warrenpoint	4.77	121	...
"	Glenquoich .....	...	...	...	"	Seaforde	5.01	127	190
"	Inverness, Culduthel R.	4.23	107	...	"	Donaghadee	3.58	91	158
"	Arisaig, Faire-na-Squir	3.35	85	...	"	Banbridge, Milltown ..	3.93	100	175
"	Fort William	3.86	98	100	<i>Antr.</i>	Belfast, Cavehill Rd. ..	5.49	139	...
"	Skye, Dunvegan	4.03	102	...	"	Glenarm Castle	5.28	134	...
"	Barra, Castlebay	3.00	76	...	"	Ballymena, Harryville ..	6.15	156	215
<i>R&C</i>	Alness, Ardross Cas. ...	5.77	147	222	<i>Lon.</i>	Londonderry, Creggan ..	4.80	122	183
"	Ullapool	2.43	62	...	<i>Tyr.</i>	Donaghmore	5.47	139	...
"	Torridon, Bendamph ..	3.92	100	86	"	Omagh, Edenfel	5.92	150	229
"	L. Carron, Plockton ..	2.26	57	...	<i>Don.</i>	Rath Head	3.72	94	188
"	Stornoway	3.06	78	120	"	Rathmullen .....	...	...	...
<i>Suth.</i>	Dunrobin Castle .....	...	...	...	"	Dunfanaghy	3.75	95	144
"	Lairg	2.29	58	...	"	Narin, Kiltorish	5.47	139	...
"	Tongue Manse	3.13	79	131	"	Killybegs, Rockmount.	5.26	134	146

Climatological Table for the British Empire, December, 1923

STATIONS	PRESSURE		TEMPERATURE						PRECIPITATION				BRIGHT SUNSHINE	
	Mean of Day from M.S.L.	Diff. from Normal	Absolute			Mean Values			Mean Cloud Amt	Am't Normal	Diff. from Normal	Days	Hours per day	Percentage of possible
			Max.	Min.	° F.	Max.	Min.	1/2 max. min.						
	mb.	mb.	° F.	° F.	° F.	° F.	° F.	° F.	°-10	mm.	mm.			
London, Kew Obsy. . .	1015.7	+ 2.0	51	25	45.0	33.3	39.1	- 1.2	39.1	52	- 6	18	1.1	15
Gibraltar	1023.3	+ 3.7	67	41	60.4	48.0	54.2	- 1.8	49.6	10	- 130	4	...	...
Malta	1014.7	+ 1.2	68	39	60.6	53.2	56.9	- 0.1	52.1	103	+ 17	3	5.1	53
Sierra Leone	1011.6	+ 0.4	92	73	89.7	75.6	82.7	+ 1.2	76.7	5	+ 32	3	...	...
Lagos, Nigeria	1009.8	- 0.7	92	74	90.1	76.8	83.5	+ 2.2	78.6	0	- 21	0	...	...
Kaduna, Nigeria	1013.6	+ 0.8	94	...	90.5	...	...	...	61.4	0	- 3	0	...	...
Zomba, Nyasaland . . .	1008.5	- 0.1	94	59	81.8	65.0	73.4	+ 0.7	...	342	+ 51	22	...	...
Salisbury, Rhodesia . .	1008.7	- 1.2	99	49	84.3	55.6	69.9	- 0.0	63.7	200	+ 54	18	...	...
Cape Town	1014.9	+ 0.6	88	51	78.7	60.8	69.7	+ 2.1	66.0	5	+ 17	4	...	...
Johannesburg	1010.8	- 0.2	86	46	77.1	54.7	65.9	+ 0.8	55.8	59	- 64	10	8.0	59
Mauritius . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bloemfontein . . . . .	...	...	97	48	88.4	58.8	73.6	+ 1.8	60.3	5	- 57	3	...	...
Calcutta, Alipore Obsy. .	1015.9	+ 0.2	83	49	78.5	57.2	67.9	+ 1.4	58.3	5	- 0	* 1	...	...
Bombay	1012.1	- 1.2	90	65	86.0	71.1	78.5	+ 1.2	66.6	0	- 93	* 0	...	...
Madras	1013.1	- 0.4	87	67	83.3	71.2	77.3	- 0.8	71.9	65	+ 2	3	...	...
Colombo, Ceylon	1010.0	+ 0.2	92	69	85.6	72.4	79.0	- 0.7	75.3	229	+ 89	17	5.9	50
Hong Kong	1020.6	+ 0.7	80	48	68.8	60.6	64.7	+ 1.8	59.1	8	- 23	5	4.8	45
Sandakan . . . . .	...	...	88	73	85.6	74.8	80.2	+ 0.1	76.7	542	+ 93	21	...	...
Sydney	1012.4	+ 0.5	98	58	79.8	64.2	72.0	+ 2.0	65.4	34	- 33	11	8.0	56
Melbourne	1012.5	- 0.0	100	48	74.5	56.1	65.3	+ 1.0	59.1	80	+ 21	13	...	...
Adelaide	1012.5	- 0.7	106	48	82.7	59.7	71.2	- 0.0	60.3	69	+ 45	10	7.9	55
Perth, W. Australia . . .	1012.8	- 0.5	95	53	80.5	59.7	70.1	- 0.5	61.0	30	+ 7	4	10.1	72
Coolgardie	1010.8	- 0.4	100	49	88.3	59.2	73.7	- 2.1	63.7	22	+ 12	6	...	...
Brisbane	1013.7	+ 1.8	96	66	85.8	70.7	78.3	+ 1.9	72.5	74	- 51	15	8.0	57
Hobart, Tasmania	1008.5	- 1.2	88	39	68.5	51.6	60.1	- 0.3	52.9	55	+ 5	13	7.4	49
Wellington, N.Z.	1015.2	+ 3.4	75	48	69.4	57.6	63.5	+ 3.0	58.1	46	- 36	11	7.0	46
Suva, Fiji	1010.7	+ 2.1	85	67	82.2	71.7	76.9	- 2.0	73.7	202	- 106	16	...	...
Kingston, Jamaica	1014.8	+ 0.6	91	66	87.1	68.4	77.7	- 0.0	...	7	+ 34	2	...	...
Grenada, W.I.	1013.5	+ 1.6	88	69	83.1	72.9	78.0	- 0.1	74.5	321	+ 133	22	...	...
Toronto	1015.8	- 1.6	53	18	41.3	31.0	36.1	+ 9.9	32.9	77	+ 5	13	1.7	19
Winnipeg	1015.1	- 2.8	44	- 20	25.5	10.0	17.7	+ 12.0	16.0	7	+ 17	4	3.6	44
St. John, N.B.	1014.3	+ 0.1	52	5	37.3	25.0	31.1	+ 6.7	29.3	153	+ 47	17	2.3	26
Victoria, B.C.	1016.3	- 0.5	55	17	45.0	38.0	41.5	- 0.0	39.6	108	- 42	21	1.7	20

* For Indian stations a rain day is a day on which 0.1 in. (2.5 mm.) or more rain has fallen. † Mean of observations at 9h., 15h., 21h., from April 1953.

Climatological Table for the British Empire for the Year 1923

STATIONS	PRESSURE		TEMPERATURE						Mean Cloud Am't	PRECIPITATION		BRIGHT SUNSHINE			
	Mean of Day M.S.L.	Diff. from Normal	Absolute		Mean Values			Relative Humidity		Am't	Diff. from Normal	Days	Hours per day	Per-cent- age of possi- ble.	
			Max.	Min.	Max.	Min.	Diff. from Normal		Wet Bulb.						
	mb.	mb.	° F.	° F.	° F.	° F.	° F.	° F.	%	mm.	mm.				
London, Kew Obsy.	1013.7	- 1.7	90	56.7	43.1	49.9	0.2	47.0	79	6.8	637	+ 31	168	3.9	30
Gibraltar.....	1018.3	+ 1.8	95	41	69.6	63.3	- 0.8	58.1	74	4.2	687	-223	82	...	...
Malta.....	1015.6	+ 0.8	99	69	70.0	65.6	+ 0.4	60.2	75	4.3	466	+ 5	88	...	...
Sierra Leone	1012.0	+ 0.2	95	69	87.1	73.9	80.5	75.0	75	6.2	3184	-733	181	...	...
Lagos, Nigeria	1010.9	- 0.5	92	69	86.4	75.0	+ 0.5	76.8	77	7.4	1817	- 3	135	...	...
Kaduna, Nigeria	1013.5	+ 1.1	100	...	...	...	...	66.9	61	...	1106	-240	112	...	...
Zomba, Nyasaland	1012.0	- 0.1	100	46	80.2	61.1	70.6	...	85	5.1	1201	-210	132	...	...
Salisbury, Rhodesia	1012.5	- 1.6	99	31	80.4	51.7	66.0	...	62	3.4	995	+187	95	...	...
Cape Town	1016.6	- 0.4	100	37	71.3	54.5	62.9	...	73	4.3	708	+ 60	105	...	...
Johannesburg.....	1015.7	- 0.3	89	28	71.5	50.5	61.0	...	60	3.5	672	-128	83	8.7	73
Mauritius .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bloemfontein .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Calcutta, Alipore Obsy.	1007.1	- 0.4	108	47	87.6	71.1	79.4	...	81	5.4	1434	-134	*71	...	...
Bombay	1008.6	- 0.5	96	63	86.8	75.4	81.1	+ 0.6	72.9	4.4	1970	+144	*64	...	...
Madras	1008.4	- 0.4	110	63	91.9	75.5	83.7	+ 0.8	74.9	5.0	949	-306	*45	...	...
Colombo, Ceylon	1010.1	+ 0.7	93	65	86.6	74.4	80.5	- 0.7	76.9	7.1	2425	+269	226	7.0	58
Hong Kong	1012.1	- 0.5	93	46	77.1	69.0	73.0	+ 0.7	67.6	6.6	2711	+598	136	5.9	49
Sandakan .....	...	...	92	71	87.1	75.1	81.1	- 0.2	76.6	...	3548	+500	175	...	...
Sydney	1014.5	- 1.4	103	41	72.3	56.5	64.4	+ 1.4	57.6	6.5	939	-285	123	6.9	56
Melbourne	1014.1	- 2.2	106	34	67.1	50.0	58.6	+ 0.2	53.6	5.7	575	- 72	158	...	...
Adelaide	1015.3	- 1.8	108	38	73.3	53.9	63.6	+ 0.6	54.8	5.6	757	+225	139	6.8	55
Perth, W. Australia	1015.7	- 0.7	107	40	73.2	55.6	64.4	+ 0.4	57.7	4.8	1128	+274	134	6.9	56
Coolgardie	1014.9	- 1.1	110	31	77.9	52.7	65.3	+ 0.8	56.9	4.5	192	- 66	64	...	...
Brisbane	1014.8	- 0.9	99	41	78.9	60.3	69.6	+ 0.7	63.9	6.3	590	-567	91	8.5	71
Hobart, Tasmania.....	1010.0	- 2.6	88	34	61.5	46.7	54.1	- 0.2	48.9	6.5	836	+234	198	5.8	48
Wellington, N.Z.	1013.9	- 0.2	77	30	62.0	49.2	55.6	+ 0.2	...	73	1042	-190	164	5.3	44
Suva, Fiji	1011.1	- 0.3	91	57	81.1	70.4	75.7	+ 1.3	72.7	83	2777	- 77	228	...	...
Kingston, Jamaica	1014.0	+ 0.1	98	63	88.8	71.1	79.9	+ 0.6	...	69	454	-407	62	...	...
Grenada, W.I.	1014.1	+ 1.7	90	67	84.0	73.5	78.7	0.0	73.8	74	1416	-311	232	...	...
Toronto	1016.5	+ 0.1	96	12	54.1	37.1	45.6	+ 1.2	40.6	5.3	854	+ 4	154	...	...
Winnipeg	1016.1	- 0.1	96	-35	48.7	26.9	37.8	+ 3.5	33.4	...	400	-117	98	...	...
St. John, N.B.	1014.4	- 0.3	85	-15	47.2	31.9	39.6	- 1.6	36.5	6.1	1137	- 83	143	...	...
Victoria, B.C.	1017.4	+ 1.0	86	11	55.9	44.1	50.0	+ 0.5	46.4	5.6	626	-201	136	...	...

* For Indian stations a rain day is a day on which 0.1 in. (2.5 mm.) or more rain has fallen. † Corrected to mean of observations at 9h., 15h., 21h.

THE floods reported from the Continent during April, continued during the early part of May. At Strasbourg a rise of 6 feet in 48 hours in the height of the Rhine was recorded; in Cologne, many houses were flooded and land was inundated. Summerlike weather prevailed over northern Italy until the 10th, when heavy rain and hail fell in various districts ruining many crops. Snow fell on the Treviso Alps and abnormally low temperatures were reported from Bergamo and Piaconza on the 12th. From the 10th to the 24th high temperatures were experienced generally over Central Europe. During this period violent thunderstorms were reported from many districts. On the 22nd a disastrous hail-storm was experienced in Upper Silesia: hailstones fell as large as walnuts, stripping the fruit trees of all their blossom and at the end of a quarter of an hour the hailstones were lying to a depth varying from one to six feet. Although people caught in the storm rushed for shelter, many were severely injured by the stones and thousands of birds lay dead in the fields. A feature of the storm was that, although it occurred between two and three in the afternoon, it was pitch dark at the time. Two hours after this catastrophe, the district was visited by a violent thunderstorm with torrential rain. Many people were killed by lightning, and railways, roads and bridges were carried away by the water.

From the United States comes the news of severe floods in Virginia and Maryland, the worst known for 50 years. The Ohio River at Pittsburgh rose 26 feet, or 4 feet above flood mark. At the end of the month, the Southern States were swept by wind storms, and many casualties occurred.

The high temperatures in the Arctic Ocean referred to in the article on *The Abnormal Weather of the Winter and Early Spring*, 1923-24, continued during May, the mean temperature at Spitsbergen being 29° F., or 7° above normal.

The special message from Brazil states that the rainfall over the country, with the exception of the Minas Geraes and Rio Gran do Sul States, was excessive, being 123 mm., 41 mm. and 67 mm. above normal in the northern, central and southern districts respectively. As in April numerous secondary depressions passed across the south of the country. At Rio de Janeiro both pressure and temperature were slightly above the normal for the month.

Rainfall May, 1924: General Distribution

England and Wales	214	} per cent. of the average 1881-1915.
Scotland	161	
Ireland	159	
British Isles	189	