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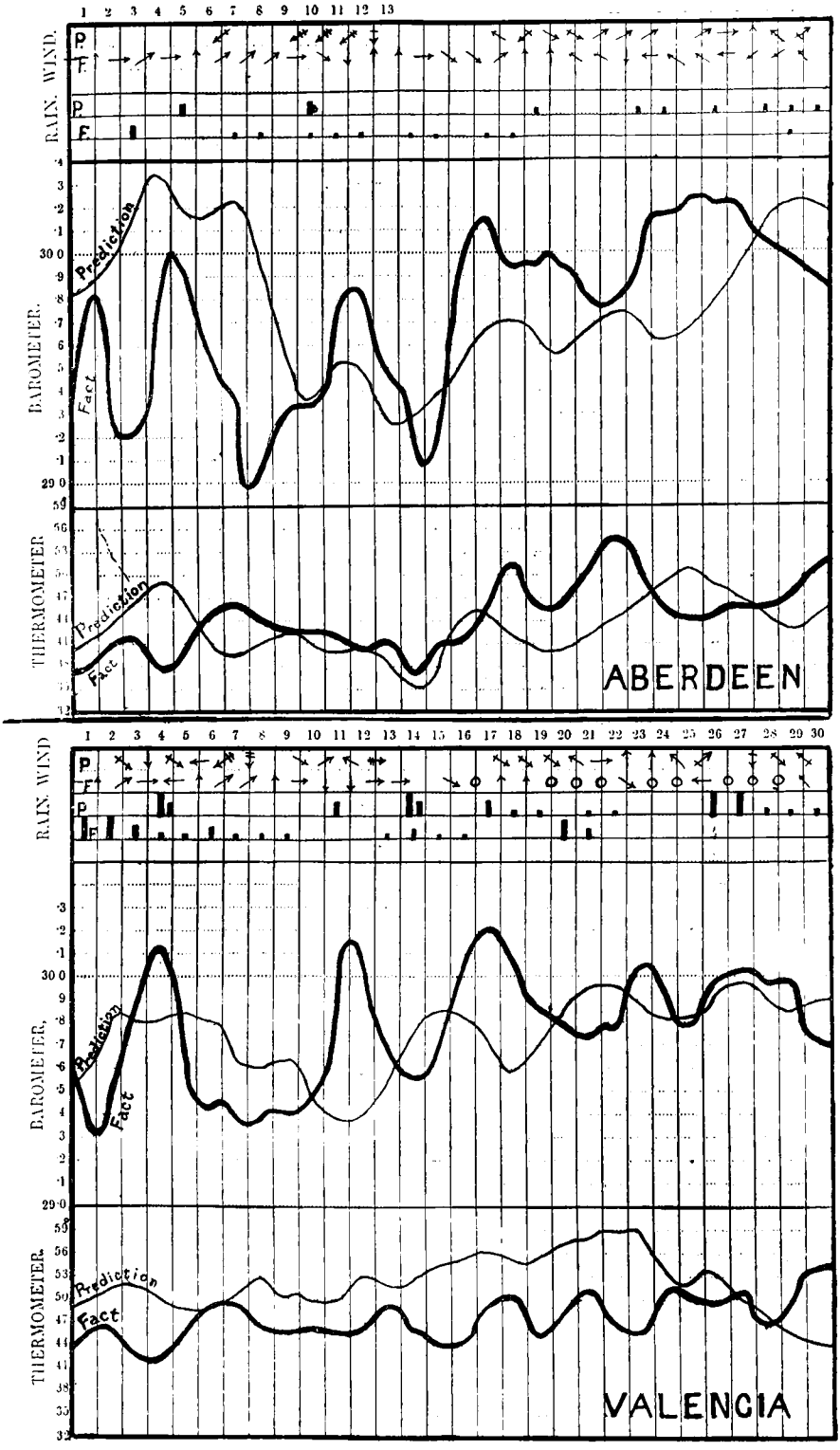
DEMCHINSKY'S WEATHER FORECASTS FOR APRIL.

BY THE EDITOR.

WE do not propose to discuss the theory of the influence of the moon on the weather put forward by M. Demchinsky in his polyglot journal *Climat*, but we recognise that it is a theory and not a mere empirical speculation like those of most upholders of lunar influence. We are interested, however, in testing the validity of M. Demchinsky's claim that his theory enables him to predict the weather for every locality for any period in advance, and we are grateful to him for supplying so liberally the evidence on which his theory can be brought to trial.

We have accordingly selected out of the seventy-four curves of the probable course of barometer and thermometer for April, published in Nos. 1 and 2 of *Climat*, those for Aberdeen and Valencia, and these are reproduced in the accompanying diagrams in a thin black line. The top row of squares in each diagram indicates the predicted direction of the wind by the direction of the little arrow, the top of the diagram being taken as the north; and the force of the wind is shown by the bars across the arrow. A little lower the predicted rainfall is indicated by a vertical black line, the length of which is proportional to the amount of fall, though not on any definite scale. On the same diagrams we have shown in the same way the actual facts of the weather of April taken day by day from the *Daily Weather Report* of the Meteorological Office. As we do not know whether the middle of the day in the Russian curves is taken as the line or the space between two lines, we cannot be sure that the prediction and the fact are exactly brought together—in other words, the curve of fact may require to be shifted as a whole half a division to the right or half a division to the left, and so we cannot look for any agreement closer than a whole day on either side of a given point. The winds are shown for 8 a.m. each day on the left hand side of the division devoted to the day, the rainfall is that measured at 8 a.m. on the day under which it stands. The barometer curve is drawn from two points daily, of which that corresponding to 8 a.m. is at the left hand line of the day-division, that at 6 p.m. in the middle of the division. The temperature is the mean of the



DEMCHINSKY'S FORECASTS FOR APRIL, 1901, COMPARED WITH THE FACTS.

maximum and minimum read at 8 a.m. and referred to the middle of the previous division. Thus the temperature under the figure 2 is the mean of the maximum on the afternoon of the 2nd, and the minimum on the night between the 2nd and 3rd.

M. Demchinsky asks that it should be borne in mind when examining the results that these are the first predictions of the kind, that his theory is in an early stage of development, and that he does not profess to give the actual values of temperature and pressure on particular days, but merely the time and direction of the changes of these values.

Before proceeding to confront the theory with the facts, we wish to make two points perfectly clear. First, that we will not take the trouble of reading or discussing any papers on the theory of the prediction of weather, or of the action of the moon, or of sunspots, or of planets, or any other bodies external to the atmosphere unless they are the work of persons of scientific training. And second, that we do not accept any theory of external influence on the atmosphere other than that of the radiant energy of the sun, and we shall require very positive proof before our opinion will change.

Comparing the barometer curves for Aberdeen, we notice at once that during the first fortnight there is a general resemblance between the prediction and the fact so far as direction of change is concerned; but the minimum on the 3rd was not foreseen; that on the 8th was at least two days too soon, and that on the fifteenth two days too late to satisfy the predictor. From the 19th to the end of the month the curves are so exactly contradictory as to excite surprise; but it is plain that any forecasts of weather founded on the predicted curve must have been entirely falsified. The most striking feature is the occurrence in the two curves of the isolated maximum on the 12th, but, as we shall see, this coincidence is not supported by other facts. As regards temperature, the periods from the 1st to the 3rd and from the 10th to the 22nd show the two curves in agreement; but from the 3rd to the 9th and from the 22nd to the 30th they are absolutely in contradiction. The frost predicted for the 20th did not occur, though that predicted for the 14th did.

Turning to the Valencia diagram we see a general correspondence between prediction and fact from the 2nd to the 9th, and a quite remarkable coincidence from the 24th to the 30th. However, for the long period from the 10th to the 23rd there is entire and nearly perfect discordance, the absolute inversion of the curves between the 10th and 13th, when those for Aberdeen showed the closest accord, being particularly striking. The predicted temperature changes were fairly verified except between the 6th and 8th, and between the 24th and 26th; but the Valencia forecast of temperature fits the facts at Aberdeen a great deal better than those at its own place. The warm spell predicted between the 18th and 24th for Valencia corresponded to the great rise of temperature at Aberdeen, where, however, a cool spell had been predicted.

No shifting of the curves to right or left would improve matters for the lunar theory, for if some additional agreements might be secured, this could only be done by sacrificing others.

The predictions of wind and rain show no relation to the 8 a.m. winds and the actual fall which occurred; and practically the forecasts as a whole appear to us to be valueless.

We would not willingly throw cold water on any effort, however quixotic it may at first appear, to reduce the turbulent disorder of the atmosphere to definite laws; and we acknowledge the possibility that amongst the seventy diagrams which we have not tested some may possibly be found of a more encouraging character. But we feel that it would have been safer and better if M. Demchinsky had devoted a few more years to testing and checking his forecasts before bringing them before the world.

ON THE OCCURRENCE OF WAVES OF EXCEPTIONAL SIZE.

By Vaughan Cornish, F.R.G.S.

We can calculate the velocity of surface waves of any given length, and the depth to which they disturb the water; we know that, in deep water, the rate of progression of a group of waves is one half the speed of the individual wave, and that the swell has the form of a trochoid. This, I think, is about the extent of our precise knowledge of the waves produced by wind on water; except in the matter of a few general properties shared by them with other waves, such *e.g.*, that there is no destructive interference between waves of small amplitude. It is desirable that more observations of sea waves should be recorded, both of normal waves and of those exceptional and almost solitary ones which merit the description of "tidal" in so far as they somewhat resemble the tide wave in the visible form of a "bore." Such waves, although rare relatively to the vast number of ordinary waves which a seaman meets in his voyages, are not so infrequent but that a careful record of observations would soon give a large number of instances for comparative study. The superposition of waves of different series, chasing one another and running more or less in the same general direction, is the normal condition of affairs in the open sea. This ordinarily causes the heights of wave crests to vary in the ratio of 1 to 2 and even 1 to 3 in one or two wave-lengths, and must occasionally give rise to a wave many times higher than those ordinarily met with. Such a billow has moreover no mere momentary existence for, the superimposed waves travelling with not very different speeds in the same general direction, the combination wave grows gradually and diminishes gradually. Passengers, whose attention is usually not given to the waves until the ship receives a shock, frequently suppose the great waves to come singly, but seamen generally say they come in triplets, three big waves one after

another. That, at any rate, is the version I usually get from men who have navigated ships on ocean voyages. As far as my personal experience goes I should say that the greater waves generally come either in a triplet or some other very short series. During the winter just passed I have crossed the North Atlantic twice, westbound in December from Liverpool to Boston, when we met with very heavy weather with head winds, and eastbound in March from New York to Southampton, when we had following winds and, on one day, a really heavy swell after the subsidence of a moderate gale. In the first voyage I measured one or two waves which attained a height of 40 feet or upwards during gales of wind, although the average height of the waves was probably 20 feet or less. During the return voyage some of the swells on the day referred to (March 13th, position at noon 48° 31′ N., 21° 40′ W.) attained 30 feet or upwards. The observations on this occasion were interesting from our present point of view. I took up a station where, with an eye elevation of about 67 feet, I had a clear view over the whole ship (except for the smoke stacks) and a horizon at 8 miles. The light was remarkably good for seeing waves, the visibility of which depends mainly upon the distribution of sunlight and shadow. Under these unusually favourable conditions for observation I was deeply impressed with the strictly normal character of the arrangement of the agitated sea in broad stretches of comparatively low flat waves with intervening narrow bands, consisting of about three great billows. The ridges of these could often be traced through a lateral extention of a mile or more. Sir G. G. Stokes has pointed out in a different connection that wind has more power to further disturb the water where the waves are high than where they are low. Thus the differences of roughness and smoothness originating in the interference of different sets of waves are increased by the wind.

I have pointed out that the great waves originating in this way can never come singly. There is, however, another case to be considered, viz., that of a sudden local disturbance such as the slipping of a submerged sandbank, or on a smaller scale the overturning of an iceberg. But even if a single wave were thus created at the place of disturbance it cannot remain single when travelling in deep water, but, as the theory of waves clearly shows, a group of waves arises in which the largest are near the centre.

May I ask for particulars of any exceptional waves which may be noticed from time to time by your readers, or for any measurements of waves? The available records are scanty, not because the observations are few but because they have not been collected.

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[In connection with the influence of wind in the formation of waves at sea, we have pleasure in drawing the attention of our readers to a series of illustrated articles by Mr. Cornish now appearing in *Knowledge*.—ED. *S.M.M.*]

ROYAL METEOROLOGICAL SOCIETY.

THE monthly meeting of this Society was held on April 17th, at the Institution of Civil Engineers, Great George Street, Westminster, Mr. W. H. Dines, B.A., the President, in the chair.

The following gentlemen were elected Fellows :—Mr. D. B. Campbell, Mr. M. Immisch, Mr. O. C. Immisch, and Mr. R. J. Robson.

A letter was read from the Home Secretary conveying the thanks of His Majesty the King "for the Loyal and Dutiful Address of the President, Council and Fellows of the Royal Meteorological Society, expressing their sympathy with His Majesty and the Royal Family on the occasion of the lamented death of Her late Majesty Queen Victoria."

Mr. W. Marriott read a paper on "The Special Characteristics of the Weather of March, 1901." From the 1st to the 13th the weather was comparatively mild, the temperature being a little above the average. The winds were mostly from the south-west or west, and strong in force, and thunderstorms were of frequent occurrence. From the 14th to the 29th these conditions were completely reversed, causing low temperatures and keen north-easterly winds. The last two days of the month were much warmer, although still slightly below the average. The contrast between the first two periods was shown in a very striking manner by means of isobaric and isothermal charts. From the 25th to the 29th the cold was most intense, the temperature being very low, and the wind particulary keen and dry. The temperature during this period was more than 10° below the average. From the *Weekly Weather Report* it appears that for the week ending March 30th, the temperature over Scotland was 10° below the average, over the greater part of England and Wales 9°, and over Ireland 8°.

The great dryness of the air will be seen from the low relative humidity recorded at the Royal Observatory, Greenwich —viz., 26th, 52 per cent.; 27th, 54 per cent.; 28th, 67 per cent.; and 29th, 63 per cent. It appears that a relative humidity as low as 52 per cent. for the day in the month of March has only been recorded once before during the last 54 years—viz., on March 1st, 1886; and no two consecutive days have had such low relative humidities in March as the 26th and 27th of the present year.

From an examination of the U.S. *Pilot Chart* it appears that a number of depressions passed across the Atlantic in a north-easterly direction during the month of March, and that their path was considerably to the west and north-west of the British Isles. This confirms the reports in the newspapers of the boisterous character of the weather over the North Atlantic. The only depression shown on the chart which passed across the British Isles travelled in an unusual direction, from north to south, the centre being over the north of Scotland on the 7th, near Paris on the 8th, and over the

Gulf of Genoa on the 9th. It was apparently this depression which caused the red rain of African sand in the south of Italy.

On the 20th a snow storm occurred over the south of England, being heaviest in the southern portion of Devon and Cornwall. At Torquay the melted snow yielded 2·31 in., and at Buckfastleigh 2·06 in. On the 29th a snow storm of great severity occurred over the northern part of England and Wales. At Llanerchymedd, in Anglesea, the melted snow measured 2·35 in., while over practically the whole of the north of Wales and the north-west of England the amount was over one inch.

Although the death rate was below the average, there was, as a result of the bitterly cold weather, a considerable increase in the deaths due to diseases of the respiratory organs. Vegetation also was at a standstill.

Mr. A. J. Hands made some remarks on several cases of damage by lightning during the month of March.

Mr. H. Southall said that the blackthorn was extremely late this year. It was on the point of appearing during the first week of March, but did not actually come out till April 14th.

Mr. H. N. Dickson spoke on the influence of the temperature of the surface water of the ocean upon the distribution of atmospheric pressure. He thought that it might perhaps be possible to form an opinion of the character of coming winters in western Europe from the records of the temperature of the surface water of the North Atlantic during the previous summer.

The President, Mr. F. J. Brodie, and Mr. C. Harding also took part in the discussion, and Mr. W. Marriott replied.

A paper by Mr. R. Strachan on "Vapour Tension in relation to Wind," was read by the Secretary.

METEOROLOGICAL NEWS AND NOTES.

Mr. H. H. Clayton's paper on the Eclipse Cyclone has been made the subject of a critical discussion in *Science* for April 12th by Mr. Frank H. Bigelow, who gives a very clear account of Ferrel's theory of a cyclone with a cold centre, and illustrates the description by means of effective diagrams. Mr. Bigelow recognises that (as we pointed out in our notice of Mr. Clayton's paper in the April number of this Magazine) the circulation of air round the centre of the eclipse shadow is anticylonic in direction; and he shows that our surmise as to a cold-air cyclone being another name for a moving anticyclone is erroneous, because the phenomenon due to the eclipse is not a cold-air cyclone at all. He says—"The Weather Bureau observations at sixty-five stations confirm the Clayton distribution of pressure, but the conclusion is also unavoidable that we are not dealing with a cold-center cyclonic circulation." The accuracy of the theory of semi-diurnal cyclones is also questioned, and Mr. Clayton is supplied with an opportunity for defending his thesis and still further elucidating a question of great theoretical interest.

MR. J. Y. BUCHANAN, F.R.S., delivered a course of three lectures on "Climate, its Causes and Effects," at the Royal Institution, on Saturdays April 20th, 27th, and May 7th. The first lecture dealt comprehensively with the amount of heat received from the Sun, its measurement by means of calorimeters, and its distribution in latitude and season over the globe. The second lecture concerned types of climate, grouped as the equatorial or jungle climate, the tropical or desert climate, the polar or frigid climate, and the temperate or composite climate. The modifying influences of land and sea, and of elevation above sea-level were then considered; and the third lecture dealt in greater detail with the climate of the polar regions and lofty mountains.

DR. SYMES THOMPSON gave a course of four lectures on the "Climate of Algiers," at Gresham College, commencing on April 16th. He treated the subject in much detail, mainly from the points of view of medicine and hygiene.

"THE CAMBRIAN NATURAL OBSERVER," a quarterly record of natural phenomena in Wales, gives in a recent number an article on "Natural Science in the Principality," in the course of which a suggestion is made that we would like to see brought before every municipality in the United Kingdom, omitting, where necessary, the sentence on the Welsh language:—"Our municipal authorities might copy the example of Germany. There, in Berlin and perhaps other towns, are street pillars with meteorological and such like instruments, with forecasts, and notes on current phenomena, so that pedestrians find themselves insensibly interested. Why should there not be something of the kind outside every town hall and parish room in Wales? The information might, if necessary, be given in Welsh, a vehicle which has been used too little in the dissemination of science."

UNIFORMITY in the units used for scientific work has received much more attention on the Continent than in English-speaking countries, and we observe from the supplement to *Petermanns Mitteilungen* that the centigrade thermometer is the only form to be permitted henceforth in German schools. The Réaumur scale, against the continued use of which this rule has been made, has never been used to any extent in scientific work, but it has obtained a hold of the public in Germany and Russia similar to that of the Fahrenheit scale amongst English-speaking people.

MONSIEUR A. ANGOT publishes in the March number of the *Annuaire* of the French Meteorological Society a table of the average monthly frequency of rain in Paris for the twenty-eight years 1873—1900. The observations are for the Parc Saint-Maur, and the following is the average number of days on which any rain whatever was recorded:—

Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
13·8	13·0	13·0	12·5	12·7	13·2	12·9	12·2	12·0	15·1	15·5	15·8

The average number of rainy days in the year was just under 162; but the number of days on which the fall was ·40 in. or over was only 22. It will be noticed that August and September are the months with fewest rainy days in Paris, while October, November and December have most.

THE SECOND INTERNATIONAL CONFERENCE for the Physical and Biological Study of the North Sea met at Christiania from May 6th to 11th, the delegates interested mainly in the physical work were Professor Mohn, Professor Krümmel, Professor Otto Pettersson, Mr. Ekman, Mr. Knudsen and Dr. H. R. Mill.

FORTY YEARS' METEOROLOGICAL OBSERVATIONS AT CAMDEN SQUARE.

Lat. 51° 32′ 40″ N., Long. 0° 8′ 0″ W., Altitude 111 ft.

DURING 1898 and 1899 Mr. Symons published in this Magazine every month a table of the forty years' observations for the month of the same name during forty consecutive years. The tables in 1898 dealt with the average monthly means or totals and the highest and lowest readings in each month of all the instruments observed. The monthly tables in 1899 gave the actual means and extremes for each year of the forty for rainfall, temperature and cloud. A third set of tables was designed to give the monthly and annual values of each of the meteorological elements, and so make the series complete as far as practicable.

It is at once a duty and a privilege to complete the series, and so make fully available the finest record of the climate of London ever made, a record the value of which is enhanced by the fact that it forms an epitome of the life-work of one man. The additional tables include—

(1) The Mean and Extreme Annual Values for each of the forty years.
(2) Monthly and annual Barometric Pressure.
(3) Monthly and annual Mean Temperature.
(4) Monthly and annual Extreme Temperatures in Shade.
(5) Monthly and annual Maximum Sun Temperatures.
(6) Monthly and annual Minimum Grass Temperatures.
(7) Monthly and annual Rainfall.
(8) Monthly and annual amount of Cloud.

It is to be noted that, as the first table shows, the values refer to the forty years commencing with January 1st, 1858, except—

Grass Minimum (38 years), from	January 1st,	1860.
Solar Radiation, black bulb (28 years)	..	1870.
Temp. of Soil at 1 foot (27 years)	,,	1871.
Solar Radiation, bright bulb (20 years)	,,	1878.

ANNUAL MEANS

Years.	BAROMETER.			SHADE TEMPERATURE.				
	Mean.	Extremes.		Means.			Extremes.	
		Highest.	Lowest.	9am & 9pm	Max.	Min.	Max.	Min.
	in.	in.	in.	°	°	°	°	°
1858...	29·885	30·560	28·888	49·3	58·8	42·0	92·6	20·1
9...	·820	·683	·535	50·7	59·4	43·4	91·9	14·4
60...	·875	·624	·722	47·3	55·2	41·1	76·1	6·7
1...	·973	·689	·983	49·3	59·0	42·1	89·5	14·3
2...	·950	·689	29·041	49·8	57·6	43·2	81·1	18·1
3...	·991	·693	28·931	50·4	59·4	43·0	85·0	24·5
4...	·971	·690	·783	48·9	58·3	41·5	89·4	15·1
65...	·967	·782	·626	50·1	60·2	43·4	88·2	15·4
6...	·899	·663	·802	50·1	58·9	43·5	87·2	22·5
7...	·981	·788	·736	49·5	57·4	42·7	88·2	6·7
8...	·969	·653	·805	52·1	61·1	43·9	93·3	23·4
9...	·971	·589	29·054	50·0	58·9	42·8	91·0	20·8
70 .	·987	·628	28·907	48·9	58·6	41·9	91·2	14·0
1...	·966	·520	·888	48·7	57·8	42·0	82·2	19·7
2 ..	·811	·473	·616	51·1	59·9	43·9	92·3	26·1
3...	·959	·790	·476	49·0	58·1	42·4	90·1	22·9
4...	·987	·735	·630	49·6	58·8	42·5	90·8	18·4
75...	·990	·660	·666	49·6	58·1	43·0	86·1	20·7
6...	·891	·662	·398	50·1	58·9	43·6	92·6	18·9
7...	·895	·683	·733	49·8	58·5	43·1	87·1	23·5
8...	·925	·671	29·006	49·5	58·1	43·3	86·5	18·7
9...	·945	·784	28·838	46·3	54·1	40·6	80·2	16·1
80...	·982	·653	·760	49·1	58·3	43·0	88·3	19·2
1...	·951	·650	·937	48·7	57·4	42·0	94·6	11·8
2...	·942	·950	·970	49·7	58·3	43·1	77·8	24·5
3...	·978	·854	·902	49·3	58·2	42·7	85·6	22·4
4 .	30·011	·680	·610	50·7	59·3	43·6	86·9	25·3
85...	29·950	·607	·941	48·4	57·1	42·0	90·4	22·3
6..	·922	·751	·323	48·4	57·1	42·4	87·5	19·4
7 ..	30·031	·747	·812	47·6	56·5	41·0	88·8	14·5
8...	29·968	·736	·824	47·5	55·5	41·9	84·7	19·1
9...	·982	·733	29·007	48·6	56·8	42·7	84·5	19·2
90...	·977	·693	28·712	48·4	56·9	42·1	78·2	14·9
1...	·978	·728	·533	48·2	56·6	41·9	84·3	16·8
2...	·963	·589	29·170	48·0	56·7	41·2	84·7	16·7
3...	30·004	·755	28·761	50·6	60·6	43·2	90·7	15·4
4...	29·978	·645	·911	49·7	58·1	43·2	88·2	13·1
95...	·933	·613	·912	48·7	57·9	41·8	86·2	7·3
6...	30·031	·934	·668	50·0	58·5	43·3	88·7	23·2
1897...	29·984	·741	·746	50·0	58·3	43·7	88·4	23·4
Mean ...	29·954	30·694	28·789	49·3	58·1	42·6	87·3	18·2
Highest	30·031	30·950	29·170	52·1	61·1	43·9	94·6	26·1
Lowest.	29·811	30·473	28·323	46·3	54·1	40·6	76·1	6·7

CAMDEN SQUARE FOR 40 YEARS, 1858–97.

AND EXTREMES.

SUN MAX.		GRASS MIN.		RAINFALL.			CLOUD	Years.
Mean.	Highest.	Mean.	Lowest.	Total.	Max. Fall.	Rainy Days.	Mean.	
°	°	°	°	in.	in.			
...	...	...	...	18·77	·94	106	5·4	...1858
...	...	...	...	28·21	1·66	167	5·8	... 9
...	...	38·0	1·8	32·24	1·10	204	6·3	... 60
...	...	37·9	8·5	22·27	1·42	151	5·8	... 1
...	...	39·6	13·3	27·59	·94	173	6·5	... 2
...	...	38·9	17·8	21·59	1·55	132	5·8	... 3
...	...	38·1	8·8	16·93	1·01	110	6·1	... 4
...	...	39·5	10·8	29·48	1·12	164	5·3	... 65
...	...	37·8	9·3	31·60	1·33	192	5·7	... 6
...	...	38·2	0·5	26·29	1·82	153	6·3	... 7
...	...	40·8	20·5	23·40	·93	142	6·1	... 8
...	...	39·4	17·2	25·42	1·03	147	6·4	... 9
90·3	136·8	(38·1)	10·4	21·32	·95	139	5·8	... 70
88·0	131·0	39·9	17·5	25·02	1·23	158	6·0	... 1
91·0	132·9	41·1	22·8	33·86	1·05	204	5·8	... 2
88·8	135·2	39·2	19·4	22·67	1·04	160	6·3	... 3
89·0	134·0	40·2	15·8	18·82	·99	164	6·0	... 4
86·6	131·3	40·6	20·6	28·44	1·29	185	6·4	... 75
89·0	134·2	40·0	17·8	26·16	1·61	173	6·2	... 6
89·8	133·9	39·6	22·7	28·17	·87	195	6·0	.. 7
88·6	135·2	40·0	12·2	34·08	3·28	172	6·5	... 8
82·9	131·9	37·6	7·8	33·82	1·49	181	6·9	... 9
89·8	133·7	39·3	13·7	30·28	1·33	158	6·5	.. 80
88·9	137·7	37·9	0·6	27·92	1·08	152	6·4	... 1
88·3	130·0	39·5	19·4	27·14	1·08	165	6·5	... 2
86·5	127·6	38·9	19·3	24·40	1·43	164	6·1	... 3
84·6	125·4	39·6	21·4	20·35	1·47	150	6·1	... 4
83·0	129·3	37·1	15·4	26·64	1·48	165	6·1	... 85
84·0	133·4	37·5	8·3	27·01	1·82	176	5·8	... 6
84·6	133·4	37·1	11·0	19·21	1·44	140	6·0	... 7
82·6	127·6	37·7	16·1	27·73	1·39	173	6·7	... 8
83·4	126·3	38·8	13·5	23·84	1·08	169	6·5	... 9
85·4	126·9	38·2	5·5	21·23	1·67	161	6·2	.. 90
85·1	127·1	37·5	12·5	28·15	1·44	178	6·2	... 1
85·5	130·2	36·5	12·1	22·60	1·71	158	5·7	... 2
89·4	134·3	39·2	10·0	19·80	1·15	148	5·2	... 3
86·2	128·2	38·9	14·3	27·94	1·35	185	6·2	... 4
86·3	135·3	37·8	5·0	21·47	1·24	137	5·6	... 95
86·2	135·9	38·0	19·1	23·52	·75	159	6·2	... 6
86·3	132·6	39·0	16·6	22·86	·83	164	6·3	...1897
86·8	131·8	38·8	13·4	25·46	1·31	162	6·1	Mean.
91·0	137·7	41·1	22·8	34·08	3·28	204	6·9	Highest
82·6	125·4	36·5	0·5	16·93	·75	106	5·2	Lowest.

NOTE.—The mean grass minimum for June, 1870, is wanting; in calculating the mean for the year 1870, the average value for June for the other 37 years was adopted.

REVIEWS AND BOOKS RECEIVED.

Researches on the past and present history of the Earth's Atmosphere, including the latest discoveries and their practical applications. By DR. THOMAS LAMB PHIPSON. London: C. Griffin & Co., Ltd. 1901. Size, $7\frac{1}{2} \times 5$. pp. xii. + 194. Price 2s. 6d.

THE formal and somewhat severe title of this book does not prepare one for the pleasantly written notes and reminiscences which make up its contents. Throughout a long life Dr. Phipson has observed much, read a good deal, and made diligent use of Captain Cuttle's invaluable advice, "When found, make a note of." The various chapters are neither systematic nor exhaustive, and they are not quite up to date; but they are crowded with so many facts and inferences, some curious, some puzzling, many almost forgotten, but all interesting, that we have no inclination to carping criticism. Dr. Phipson appears to be one of those fortunate men who find in the pursuit of science an inexhaustible store-house of pleasure, and the portion of his attention bestowed on the phenomena of the atmosphere has resulted in the compilation of a very readable little volume.

Sounding the Ocean of Air: being Six Lectures delivered before the Lowell Institute of Boston in December, 1898, *by* A. LAWRENCE ROTCH, S.B., A.M. London: Society for Promoting Christian Knowledge. 1900. Size, 7×5. Pp. viii.+184. *Illustrations.*

THE Romance of Science Series, of which this forms a volume, has seldom dealt with a more fascinating advance in science than the investigation of the physical conditions of the free air. Although the form of abstracts of lectures is not one which lends itself to conspicuous literary excellence, and although several of the illustrations (some of which are called "plates," though all are printed in the text) are rough, this little volume gains steadily on the interest of the reader as he proceeds. The first three chapters deal with comparatively familiar matters—the history of atmospheric research, clouds and balloons; but the last three are full of novelty. They describe the new system of unmanned balloons (*ballons-sondes*) for the exploration of great altitudes in the atmosphere by means of self-recording instruments, and the still newer developments of the kite as a scientific instrument. Flying machines, being still in the future so far as practical results are concerned, are not treated at length.

The *ballon-sonde* "Cirrus" in an ascent made in Germany in 1895 rose to the height of 72,000 feet or $13\frac{1}{4}$ miles, if the recorded barometric mininum of 1·50 in. of mercury is to be trusted; but as to this, Mr. Rotch appears not to be quite satisfied. The highest ascent recently made by an aeronaut was that by Dr. Berson in 1894 to 30,000 feet, where he found it possible by inhaling oxygen to make observations in spite of the extreme rarity of the air.

Most interest attaches to the experiments with kites, to their results, and the history of the development of the boy's toy into a valuable piece of scientific apparatus. The matter has been so recently referred to in this Magazine that it will suffice to recall the reader's attention to the numbers for September and October last (Vol. 35, pp. 120, 132). By the use of the Hargrave's box kite and steel wire, Mr. Rotch states that he found it possible to send self-recording instruments to altitudes of 12,000 feet, or more than $2\frac{1}{4}$ miles above sea-level; and since the book was written these heights have been exceeded. The advantages of kites over unmanned balloons are their great cheapness, the steadiness with which they may be kept for many hours in one position near any desired level, and the ideal exposure of the instruments they carry to the influence of the free air, for the kites always face the full force of whatever wind may be blowing.

Annuaire de l'Observatoire Royal de Belgique. 1899, *Soixante-sixième Année, Supplement.* Bruxelles, 1900. Size 6 × 4; pp. 200. Diagrams.

Observatoire Royal de Belgique. Annuaire Météorologique pour 1901. *Publié par les soins de* A. LANCASTER. Bruxelles, 1901. Size 6 × 4; pp. 576. Maps and diagrams.

WITH the new century the Brussels Observatory has taken a step in advance, and in place of having the meteorological annual as a supplement to the astronomical, it is now published as a separate volume. The object of the new annual is to publish papers of interest to the general public, together with data of permanent value for professional and amateur meteorologists, and for those who follow the many practical pursuits in which a knowledge of weather or climate is necessary.

A table of contents has, unfortunately, been omitted, and there is no index, two serious bars to the utility of any work of reference. The volume contains a calendar, in which, for every day in the year, are entered the mean and extreme temperatures for 60 years, with notes as to the natural phenomena characteristic of the season. A sketch of the history of Meteorology in Belgium, by M. A. Vincent, covers the period from the earliest times to 1769. Then follow nearly 100 pages of annual and monthly values of meteorological data since 1833, a paper by M. Lancaster, on Earthquakes in Belgium, 50 pages of meteorological tables, two old meteorological diaries, one ranging from 1779 to 1810, the other from 1807 to 1830, some other memoirs, and finally a detailed account of the climate of Belgium in 1899.

It forms altogether a most useful and interesting year book, and we could wish that our own Meteorological Council might some day see its way to add to the many advantages it has secured in our meteorological service by compiling a similar compact and popular work in the English language.

Hints to Travellers, Scientific and General. Edited for the Council of the Royal Geographical Society, by JOHN COLES. *Eighth edition. Revised and enlarged.* London, The Royal Geographical Society, 1901. 2 vols., size 7 × 5. Pp., vol. i., 436; vol. ii., 266. Maps and illustrations. Price 15s.

THIS very useful work is thoroughly practical. It aims at supplying all the information a traveller can require in fixing his position, and mapping the country, including tables of all the necessary constants, and an extensive table of logarithms, which is a marvel of compactness and clearness. The second volume contains an article of 50 pages on Meteorology and Climate, by Dr. H. R. Mill, accompanied by a series of climatological maps. The object of the article is to supply the traveller with the information necessary to allow him to make full use of the meteorological instruments he carries, and to obtain evidences of the climate of the region he is passing through by noticing the effects produced on the land, vegetation, &c. The other general articles deal with photography, geology (including a special section on glacier observations), natural history, anthropology, industry and commerce, and an extremely valuable chapter (the longest in the book) on Medical Hints, by Dr. W. H. Crosse. This naturally deals mainly with tropical countries, where explorers are subject to the attacks of innumerable diseases, due to microbes; nothing is said of climatic diseases against which explorers in the polar regions should be on their guard, for the same reason that the section on Snakes in Ireland is a blank in works on Natural History.

Meteorological Service of the Dominion of Canada. Cloud Observations during 1896 *and* 1897 *at Toronto.* Ottawa: Government Printing Bureau, 1901. Size, 12½ × 9. Pp. 28.

CLOUD observations were commenced at Toronto in 1896 at two stations nearly a mile apart, and the altitude of particular clouds was determined by simultaneous angular measurements with theodolites. The highest cloud measured was cirrus, on one occasion, at 39,400 ft.; the greatest velocity of cloud movement, also for cirrus, seems to have been 135 miles per hour.

On Solar Changes of Temperature and Variations in Rainfall in the Region surrounding the Indian Ocean, by Sir Norman Lockyer, K.C.B., F.R.S., and W. J. S. Lockyer, M.A., Ph.D. Reprint from *Proc. R.S.* **67** (1900), 409-431.

This was noticed in the Magazine last year, Vol. **35**, p. 165.

Stonyhurst College Observatory. Results of Meteorological and Magnetical Observations, with Report and Notes of the Director, Rev. W. Sidgreaves, S.J., F.R.A.S. 1900. Clitheroe 1901. Size 7½ × 5. Pp. vii. + 78.

Annual Report of Meteorological Observations for the year 1900, in the Borough of Hastings, by H. COLBORNE, M.R.C.S., Borough Meteorologist. St. Leonards, 1901. Size 9½ × 6. Pp. 16. *Plate.*

Die phänologischen Beobachtungen der Jahre 1864 bis 1897 und die Ernteerträge im Königreich Sachsen in ihrer Abhängigkeit von den Witterungsverhältnissen. Bearbeitet von Dr. GROHMANN. (Amtliche Publikation des Königl. sächsischen meteorologischen Institutes). Chemnitz 1901. Size $12\frac{3}{4} \times 10$. Pp. 88.

The phenological observations in the kingdom of Saxony for the years 1864-97, and the relation between harvests and weather.

Ergebnisse der Beobachtungen an den Stationen II. und III. Ordnung im Jahre 1900, zugleich Deutsches Meteorologisches Jahrbuch für 1900. Berlin, A. Asher & Co. 1901. Size 13 × 10. Pp. 62.

Deutsches Meteorologisches Jahrbuch für 1899. Beobachtungs-System der Deutschen Seewarte. Jahrgang XXII. Hamburg, 1900. Size 13 × 9½. Pp. 198.

Charts illustrating the Weather of the North Atlantic Ocean in the Winter of 1898-9. Published by the authority of THE METEOROLOGICAL COUNCIL. London. Printed for Her Majesty's Stationery Office. 1901. Size 13 × 17. Pp. 9, +10 plates. Price 6s. 6d. *To be reviewed.*

Correspondence.

SOLAR HALO, AND FINE WEATHER.

To the Editor of Symons's Meteorological Magazine.

On Thursday, April 18th, I went out at 9.10 a.m., *i.e.*, at 9 a.m. local time, to take my daily estimate of wind and cloud, and saw in the N.W. what at first I took to be a long thin wisp of cirrus on a background of hazy sky. Its uniformity of breadth attracted my attention, and it proved to be a large continuous horizontal circle of white light passing round the sky and through the Sun. I then found that round the Sun itself there was a very fairly defined circle also of white light, cutting the first-named circle of course at two points. On the horizontal circle, *not* (it appeared to me, as well as I could observe against the dazzling glare of the Sun) *at* the points of intersection, but just outside them, were two patches of rainbow coloured light. This condition lasted for about twenty minutes, when the large circle slowly faded away. Not so the solar halo, which became brighter and brighter, and at 9.50 was quite conspicuous and strongly coloured. After 10 it also faded. A thin veil of cirrus covered the whole sky all the time.

A somewhat similar phenomenon which I saw here in 1897 preceded the famous Essex storm of June 24th; but on this occasion since April 18th the weather has continued uniformly brilliant, at least in this district.

H. A. BOYS, F.R.Met.Soc.

North Cadbury Rectory (30 m. S. of Bath),
April 27, 1901.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, NOVEMBER, 1900.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Absolute. Maximum. Date.	Absolute. Minimum. Temp.	Absolute. Minimum. Date.	Average. Max.	Average. Min.	Average. Dew Point.	Average. Humidity.	Absolute. Max. in Sun.	Absolute. Min. on Grass.	Total Rain. Depth.	Total Rain. Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	62·0	1	28·3	11	51·2	41·5	42·8	88	88·9	22·3	1·90	18	7·4
Malta	77·4	5	51·7	28	71·1	59·0	57·4	83	131·1	49·0	3·64	13	3·5
Cape of Good Hope	83·3	2	44·9	4	72·2	53·3	52·8	66	...	...	·84	10	4·1
Mauritius	83·1	23	62·7	2	80·3	68·4	62·9	69	146·2	52·2	1·31	13	5·7
Calcutta	88·9	3	57·1	30	84·1	63·6	62·2	68	143·1	52·0	·00	0	1·6
Bombay	92·3	4	72·3	11	87·8	74·5	69·6	69	141·5	61·6	·00	0	1·1
Colombo, Ceylon	91·2	5	73·0	12	88·4	74·3	71·7	80	157·0	70·0	9·25	19	5·5
Melbourne	97·5	25	40·4	7	69·4	50·4	47·5	68	155·0	33·3	1·04	7	5·4
Adelaide	105·6	24	47·8	2, 4	82·1	55·6	47·7	47	159·0	40·1	·57	4	3·1
Sydney	94·2	1	54·5	20	73·6	60·1	56·4	71	151·3	49·0	8·14	18	6·6
Wellington	70·0	23*a*	40·0	1	62·5	49·0	44·7	67	126·0	29·0	1·83	14	4·1
Auckland	71·5	10	45·5	15	65·8	53·1	46·9	67	141·0	42·0	1·98	14	5·6
Jamaica, Halfway Tree	92·0	19	68·0	24	87·2	70·5	69·1	79	...	...	·78	5	3·4
Trinidad	91·0	26	68·0	14*b*	87·0	70·0	73·6	85	161·0	47·0	5·41	18	...
Grenada	88·0	4	72·0	16	84·4	74·6	73·5	77	150·5	...	4·44	23	4·3
Toronto	64·8	1	14·1	16	44·8	32·5	34·0	81	82·2	6·0	3·90	16	7·4
Fredericton New Brunswick	67·8	2	2·5	29	42·4	24·9	26·5	72	...	...	5·60	13	6·8
Winnipeg, Manitoba	51·0	1	—19·5	23	24·9	7·0	...	79	...	...	·84	8	6·5
Victoria, British Columbia	57·0	2	19·8	21	48·6	38·5		...	...	...	2·32	13	6·1

a—and 25th. *b*—and 19th.

REMARKS.

MALTA.—Mean temp. of air 63°·7 or 1°·5 above the average. Mean hourly velocity of wind 10·3 miles or 1·0 above average. Mean temp. of sea 70°·9. TSS on 7 days; L on 4 days. J. F. DOBSON.

Mauritius.—Mean temp. of air 0°·3, of dew point 1°·3, and rainfall ·48 in., below their respective averages. Mean hourly velocity of wind 10·0 miles, or 0·6 below average; extremes, 22·2 on 27th and 0·0 on 2nd and 4th; prevailing direction E.S.E. to E. by N. T. F. CLAXTON.

COLOMBO, CEYLON.—Mean temp. of air 0°·3 above, of dew point 0°·6 below, and rainfall 3·41 in. below, their respective averages. Mean hourly velocity of wind 6·5 miles; prevailing direction N. and N.E. TSS occurred on 14 days; L was seen on 7th and 20th. W. C. S. INGLES.

Adelaide.—Mean temp. of air 1°·8 above the average. Dry and hot month; rain ·44 in. below the average of 43 years. Sunshine 66 hours above the average. C. TODD, F.R.S.

Sydney.—Mean temp. of air 0°·1 above, humidity 1°·8 below, and rainfall 4·91 in. above, their respective averages. H. C. RUSSELL, F.R.S.

Wellington.—Mean temp. of air 0°·8 below, and rainfall 2·34 in. below, their respective averages. Very small total rainfall; the latter part of the month was very fine. Prevailing wind N.W., frequently strong. R. B. GORE.

Auckland.—Mean temp. about 1°·2 under the average of the previous 32 years. On the whole a fine though cool month. Rainfall barely half the average. T. F. CHEESEMAN.

TRINIDAD.—Rain 1·45 in. below the 30 years' average. J. H. HART.

TORONTO.—First snow on 10th, and last TS on 21st. R. F. STUPART.

SUPPLEMENTARY TABLE OF RAINFALL, APRIL, 1901.

Div	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
I.	Uxbridge, Harefield Pk..	2 39	XI.	Castle Malgwyn	4·01
II.	Dorking, Abinger Hall .	2·19	,,	Builth, Abergwesyn Vic.	6 16
,,	Birchington, BeresfordLge.	...	,,	Rhayader, Nantgwillt...	5·59
,,	Hailsham	2·25	,,	Lake Vyrnwy	3 88
,,	Crowborough.....	3·27	,,	Corwen, Rhug	3·45
,,	Ryde, Thornbrough	...	,,	Criccieth, Talarvor	2·77
,,	Emsworth, Redlands ...	2·76	,,	I. of Anglesey, Lligwy..	1 85
,,	Alton, Ashdell	2·57	,,	Douglas, Woodville.....	2·94
,,	Newbury, Welford Park	2·63	XII.	Stoneykirk, Ardwell Ho.	2·83
III.	Oxford, Magdalen Coll..	1·95	,,	New Galloway, Glenlee	5·64
,,	Banbury, Bloxham	2·64	,,	Moniaive, Maxwelton Ho.	4·54
,,	Pitsford, Sedgebrook ...	2·71	,,	Lilliesleaf, Riddell	2·55
,,	Huntingdon, Brampton.	2·56	XIII.	N. Esk Res. [Penicuick]	2·10
,,	Wisbech, Bank House...	1·92	XIV.	Glasgow, Queen's Park..	3·20
IV.	Southend	1·42	XV.	Inveraray, Newtown ...	5·35
,,	Colchester, Lexden	1·66	,,	Ballachulish, Ardsheal...	5·56
,,	Saffron Waldon, Newport	1·88	,,	Islay, Eallabus..... ...	3·96
,,	Rendlesham Hall	1·76	XVI.	Dollar.....	2·18
,,	Swaffham	2·26	,,	Balquhidder, Stronvar...	6·18
V.	Salisbury, Alderbury ...	2·42	,,	Coupar Angus Station...	2·62
,,	Bishop's Cannings	2·42	,,	Blair Atholl	2·03
,,	Blandford, Whatcombe .	3·10	XVII.	Keith H.R.S.....	1·71
,,	Ashburton, Druid House	4·53	,,	Forres H.R.S.	1·39
,,	Okehampton, Oaklands.	4·31	XVIII.	Fearn, Lower Pitkerrie..	1·02
,,	Hartland Abbey	3·66	,,	S. Uist, Askernish	3·56
,,	Lynton, Glenthorne ...	...	,,	Invergarry.....	1·43
,,	Probus, Lamellyn	4·08	,,	Aviemore, Alvie Manse.	1·69
,,	Wellington, The Avenue	3·12	,,	Loch Ness, Drumnadrochit	1·09
,,	North Cadbury Rectory	2·45	XIX.	Invershin	1·77
,,	Clifton, Pembroke Road	3·30	,,	Durness	...
VI.	Ross, The Graig	2·67	,,	Watten H.R.S.....	2·64
,,	Wem, Clive Vicarage ...	1·84	XX.	Dunmanway, Coolkelure	8·65
,,	Wolverhampton, Tettenhall	1·62	,,	Cork, Wellesley Terrace	4·07
,,	Cheadle, The Heath Ho.	1·84	,,	Killarney, District Asyl.	4·81
,,	Coventry, Priory Row ..	2·16	,,	Caher, Duneske	2 32
VII.	Market Overton	1·78	,,	Ballingarry, Hazelfort...	2·21
,,	Grantham, Stainby	1·61	,,	Limerick, Kilcornan ...	...
,,	Horncastle, Bucknall ...	1·37	,,	Miltown Malbay	3 32
,,	Worksop, Hodsck Priory	1·26	XXI.	Gorey, Courtown House	2 64
VIII.	Neston, Hinderton	2·18	,,	Moynalty, Westland ...	2·14
,,	Southport, Hesketh Park	1·78	,,	Athlone, Twyford	2·67
,,	Chatburn, Middlewood.	2·52	,,	Mullingar, Belvedere ...	2·24
,,	Duddon Val., Seathwaite Vic.	5·15	XXII.	Woodlawn	2·91
IX.	Melmerby, Baldersby ...	2·05	,,	Crossmolina, Enniscoe ..	5·40
,,	Scalby, Silverdale	2·15	,,	Collooney, Markree Obs.	3·38
,,	Ingleby Greenhow Vic..	1·77	XXIII.	Enniskillen, Model Sch.	3·20
,,	Middleton, Mickleton ...	1·46	,,	Warrenpoint.....	2·91
X.	Haltwhistle, Unthank H.	...	,,	Miltown, Banbridge.....	2·10
,,	Bamburgh	1·19	,,	Belfast, Springfield	2·87
,,	Keswick, The Bank.....	3·54	,,	Bushmills, Dundarave..	2·58
XI.	Llanfrechfa Grange	4·88	,,	Stewartstown	3·07
,,	Treherbert, Tyn-y-waun	9·24	,,	Killybegs	4·74
,,	Llandovery	3·96	,,	Horn Head	2·37

APRIL, 1901.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1890-9.	Greatest Fall in 24 hours. Dpth	Greatest Fall in 24 hours. Date	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Max. Date	Min. Deg.	Min. Date.	No. of Nights below 32°. In shade.	No. of Nights below 32°. On grass.
			inches.	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	2·15	+ ·63	·62	3	14	76·8	23	28·1	2	2	15
II.		Tenterden ...	2·06	+ ·29	·70	3	17	71·5	23	31·5	2	1	10
,,		Hartley Wintney ...	1·93	+ ·29	·64	3	15	75·0	23	28·0	28*d*	4	9
III.		Hitchin ...	2·41	+ ·89	·62	3	16	74·0	22	31·0	1, 28	4	...
,,		Winslow (Addington) ...	2·23	+ ·67	·54	3	16	73·0	22*a*	29·0	29	5	13
IV.		Bury St. Edmunds (Westley)	2·39	+ ·86	·69	3	13	74·0	22	28·0	3	...	...
,,		Norwich (Brundall) ...	2·26	...	·56	3	16	72·0	22	29·0	6	2	15
V.		Winterbourne Steepleton ...	3·27	...	·72	3	17	69·8	24	27·0	2	3	12
,,		Torquay (Cary Green)	4·58	...	·98	3	17	65·2	24	35·1	1	0	3
,,		Polapit Tamar [Launceston]..	3·77	+ 1·61	·63	3	17	72·8	24	30·3	17	6	8
VI.		Stroud (Upfield) ...	2·62	+ ·78	·57	3	16	72·0	24	30·0	1	1	...
,,		Church Stretton (Woolstaston)	2·97	+ 1·09	·57	8	15	72·5	23	32·0	13	1	14
,,		Worcester (Diglis Lock) ...	2·42	+ ·99	·58	3	16	...	...	...	...	...	...
VII.		Boston ...	1·40	+ ·02	·40	3	13	80·0	22	29·0	2	6	...
,,		Hesley Hall [Tickhill]...	1·17	— ·17	·27	15	12	79·0	22	30·0	2	3	...
,,		Derby (Midland Railway)...	1·76	+ ·21	·36	3	16	78·0	21*b*	29·0	2	3	...
VIII.		Manchester (Plymouth Grove)	2·11	+ ·44	·47	8	14	76·0	21*c*	31·0	16	2	5
IX.		Wetherby (Ribston Hall) ...	2·57	+ ·83	·59	30	16	...	...	...	...	...	...
,,		Skipton (Arncliffe) ...	4·67	+ 1·31	·94	2	18	...	...	...	...	...	...
,,		Hull (Pearson Park).	·98	— ·61	·24	8	13	77·0	22	30·0	2	5	14
X.		Newcastle (Town Moor) ...	·91	— ·75	·22	27	16	...	...	...	...	...	...
,,		Borrowdale (Seathwaite)...	7·37	+ 1·03	2·68	2	17	72·0	24	29·3	17	3	...
XI.	WALES.	Cardiff (Ely)...	4·54	+ 2·36	·90	3	16	...	...	...	...	...	...
,,		Haverfordwest ...	...	...	...	...	...	...	...	...	...	...	...
,,		Aberystwith (Gogerddan) ...	3·07	+ ·50	·41	8	14	78·0	24	25·0	16*e*	7	...
,,		Llandudno...	1·68	— ·10	·38	2	15	71·0	20	34·0	1	0	...
XII.		Cargen [Dumfries] ...	...	...	...	...	...	...	...	...	...	...	...
XIII.		Edinburgh (Royal Observatory)	1·38	...	·45	8	12	68·0	22	31·5	6	4	7
XIV.		Colmonell ...	4·39	+ 2·22	2·11	2	14	76·0	24	28·0	16	...	...
XV.		Tighnabruaich ...	5·09	...	1·76	2	16	61·0	29	30·0	3*f*	8	...
,,		Mull (Quinish)...	4·44	+ 1·65	·62	12	21	...	...	...	...	...	...
XVI.		Loch Leven Sluices ...	2·75	+ ·76	·54	9	14	...	...	...	...	...	...
,,		Dundee (Eastern Necropolis)	2·30	+ ·76	1·15	2	15	70·6	22	28·0	2	8	...
XVII.		Braemar	2·06	— ·03	·73	2	18	65·0	22	23·2	16	14	21
,,		Aberdeen (Cranford)	2·35	+ ·51	·65	2	20	64·0	22	25·0	5	13	...
,,		Cawdor (Budgate) ...	1·52	— ·05	·41	11	15	...	...	...	...	...	...
XVIII		Strathconan [Beauly] ...	1·70	— 1·35	·75	2	7	..	...	...	...	...	...
,,		Glencarron Lodge...	4·62	— ·04	·56	14	20	64·8	24	28·0	4, 5	7	...
XIX.		Dunrobin ...	2·04	+ ·27	·46	10	14	61·0	22	30·0	2	5	...
,,		S. Ronaldshay (Roeberry) ...	2·51	+ ·59	·36	14	18	62·0	22	29·0	1, 9	5	...
XX.		Darrynane Abbey...	3·65	+ ·15	·51	2	21	...	...	...	...	...	...
,,		Waterford (Brook Lodge) ...	2·66	+ ·04	·50	2, 5	14	63·0	24	29·0	29	4	...
,,		Broadford (Hurdlestown) ...	2·58	+ ·50	·65	2	21	...	...	...	...	...	...
XXI.		Carlow (Browne's Hill) ...	2·37	+ ·08	·44	2	15	...	...	...	...	...	...
,,		Dublin (Fitz William Square)	·86	— 1·11	·15	15	12	65·2	21	34·7	17	0	3
XXII.	IRELAND.	Ballinasloe	3·41	+ 1·12	1·13	2	18	75·0	25	29·0	12*h*	8	...
,,		Clifden (Kylemore)	5·69	+ ·42	1·46	1	16	...	...	...	...	...	...
XXIII		Seaforde...	2·51	+ ·08	1·04	2	15	67·0	21	30·0	1, 16	3	13
,,		Londonderry (Creggan Res.).	3·00	+ ·54	·63	2	24	...	...	...	...	...	...
,,		Omagh (Edenfel) ...	3·71	+ 1·35	1·07	2	19	68·0	21	30·0	16*g*	6	13

+ Shows that the fall was above the average ; — that it was below it.

a—and 23. *b*—and 22. *c*—and 24. *d*—and 29. *e*—and 27. *f*—and 4, 10, 16. *g*—and 28. *h*—and 17.

METEOROLOGICAL NOTES ON APRIL, 1901.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

LONDON, CAMDEN SQUARE.—Unsettled and showery till the 17th, but unusually warm during the week ending 25th. The last fortnight was fine and dry. H on 15th and 27th; great darkness at 11.30 a m. on 11th. The mean temp. of the month was 49°·1, or 1°·0 above the average.

TENTERDEN.—The first half was persistently wet, with a good deal of wind. Very warm from 19th to 25th, with brilliant sunshine; then cold, with E. wind. The well rose from 6 ft. to 8 ft. 10 in., the maximum occurring on the 19th. T on 1st, and slight TS on 15th. Duration of sunshine 204·5 hours.

HARTLEY WINTNEY.—R fell every day from 1st to 16th, with light S.W. winds; afterwards, to the end, it was very dry, with N. and N.E. winds, and much sunshine. Ozone on 17 days, with a mean of 4·8. All vegetation was exceedingly backward. Swallows were seen on 5th; the nightingale was heard on 11th, and the cuckoo on 13th.

WINSLOW, ADDINGTON.—Very unsettled until the 16th, afterwards fine until the end, particularly from the 17th to 26th. H on 1st, 15th, 16th and 27th. T on 16th.

BURY ST. EDMUNDS, WESTLEY.—All the R fell during the first 16 days, none being measured during the latter fortnight. T on 10th and 15th. Migratory birds came in small numbers at the usual dates.

WINTERBOURNE STEEPLETON.—The early part of the month was both cold and wet, but after the 20th the temp. rose considerably, and for the week ending on the 27th the mean max. temp. was 61°·9, and the mean temp. 49°·7. The relative humidity was low, and the wind being mostly in the N. and E., this, with cold nights, kept back growth, and R was wanted at the end. S on 5th. Fog on 6th and 7th.

TORQUAY, CARY GREEN.—R 2·25 in., mean temp. 0°·1, and duration of sunshine 53·5 hours, above their respective averages. Mean amount of ozone 6·0, the greatest being 8·0 on 3rd, with W. wind, and the least 4·0 on 25th, with E. wind.

POLAPIT TAMAR [LAUNCESTON].—The first fortnight was exceptionally wet, and the total R of thirteen consecutive days was 3·60 in. The second fortnight was remarkably dry. Heavy S on 5th; H on 14th, 15th and 28th. Fog on 24th.

CHURCH STRETTON, WOOLSTASTON.—A cold and wet month, the R of the earlier part making field sowing operations very late.

MANCHESTER, PLYMOUTH GROVE.—Summer weather from 21st to 25th, but very cold E. wind prevailed during the last five days. H storm on 12th. TS on 16th.

HULL, PEARSON PARK.—H and S on 15th and 16th; T on 15th.

WALES.

ABERYSTWITH, GOGERDDAN.—Bright sunshine nearly every day during the last fortnight.

SCOTLAND.

COLMONELL, CLACHANTON.—Mean temp. 46°·8, or 1°·7 above the average of 25 years.

TIGHNABRUAICH, CRAIGANDARAICH.—A good spring month, with a full average R. The mean temp. was normal. Prevailing winds, N., N.E. and E. T and L on 24th. The R of 1·76 in. on 2nd was the heaviest in 24 hours during six years.

ABERDEEN, CRANFORD.—Wet and cold, with little sunshine and changeable wind.

S. RONALDSHAY, ROEBERRY.—The first part, till the 17th, was wet and cold, the latter fine and warmer. Mean temp. 43°·4, or 0°·1 below the average of 11 years.

IRELAND.

DARRYNANE ABBEY.—The first half was wet and cold, the second fairly dry and warm, with some beautiful summerlike days.

WATERFORD, BROOK LODGE.—H showers on several days. Early potatoes were injured by frost on 29th. Swallows were seen on 8th and the cuckoo heard on 23rd.

BROADFORD, HURDLESTOWN.—A very favourable month. S on 1st.

DUBLIN, FITZWILLIAM SQUARE.—Two seasons, summer and winter, may be said to have met in April, 1901. The first half was cold, showery and wintry, the second half dry, sunny, and for a while, distinctly warm. After the 23rd the temp. fell again, but drought lasted till the close. The mean temp. was 48°·6, or 0°·9 above the average. Fog on three days. High winds on twelve days, reaching the force of a gale on four. H on 4th, 15th and 16th, and S or sleet on 1st, 4th and 15th. L on 12th, and T on 15th.

OMAGH, EDENFEL.—The weather, which broke on March 24th, continued with increasing cold, wet and inclemency until well into the third week of this month. In the first eight days there fell the full average R for the whole month, and by the 17th, when the weather improved, 50 per cent. more than the average had fallen, and not more than a fourth of the grain or potatoes had been sown. The remainder of the month was, however, everything that it should be—fresh, dry and warm. The strong sun, with but little frost, stimulated a rapid growth of all vegetation. Swallows appeared on 13th, landrails on 24th, and the cuckoo was heard on May 1st.

ERRATA IN TABLES OF CAMDEN SQUARE OBSERVATIONS.

Readers are requested to be good enough to make the following corrections in their copies of the Camden Square tables published in 1898 and 1899.

SERIES 1.—*Vol. XXXIII., p. 37, March—*

Col. 1, Mean Bar.	for 29·904 read	*29·903*
,, 5, ,, 9 a.m. Bar.	,, 29·907 ,,	*29·905*
,, 6, Sol. Rad., black	,, 91·4 ,,	*91·3*
,, 7, ditto, date	,, 1882 ,,	*1883*
,, 10, Sol. Rad., black	,, 128·7 ,,	*112·6*
,, 11, ditto, date	,, 20th, 1882, read	*25th, 1881*
,, 14, Sol. Rad., black	,, 104·3 ,,	*103·6*

Vol. XXXIII., p. 52, April—

Col. 15, Bar. mean of lowest, 9 a.m., for 29·381 read *29·356*

Vol. XXXIII., p. 183, Dec.—

Col. 6, Grass Min.	for 37·4 read	*38·3*
,, 7, ditto date	,, 1876 ,,	*1868*

SERIES 2.—*Vol. XXXIV., p. 44, March—*

Col. 11, Sun. Max., black, 1882	for 128·7 read	*108·7*
,, 11, Mean	,, 104·3 ,,	*103·6*
,, 11, Highest	,, 128·7 ,,	*112·6*
,, 12, Sun Max., black, mean, 1882	,, 91·4 ,,	*90·7*
,, 12, Highest	,, 91·4 ,,	*91·3*