

SYMONS'S MONTHLY METEOROLOGICAL MAGAZINE.

CCCXVI.]

MAY, 1892.

[PRICE FOURPENCE,
or 5s. per ann. post free.]

ANEMOMETER COMPARISONS.

THE usual monthly meeting of the Royal Meteorological Society was held on Wednesday evening, April 20th, at the Institution of Civil Engineers, 25, Great George Street, Westminster. Dr. C. Theodore Williams, President, in the chair.

The President, and other Officers and Fellows of the Society spoke of the great loss which it (and other associations with which he was connected) had sustained by the death of Dr. Tripe, Council Secretary of the Society for 20 years; and a resolution of sympathy with the family was passed by the meeting.

Señor R. Aguilar y Santillan, Sir Andrew Clark, Bart, F.R.S., Mr. F. W. Cross, Assoc.M.Inst.C.E., Mr. H. Hancock, M.A., Mr. W. B. Heberden, Dr. Hermann Weber and Mr. E. R. Williams were elected Fellows of the Society.

The following papers were read :—

“Anemometer Comparisons,” by Mr. W. H. Dines, B.A., F.R.Met.Soc. This was a report on a series of experiments carried out at the request of the Council of the Society, with the object of obtaining a direct comparison of the various anemometers in common use, that an opinion might be formed as to which type is most suitable for general purposes, the cost of the experiments being defrayed out of a vote made by Parliament to the Meteorological Council for such purposes.

The anemometers compared were :—1. Kew Pattern, Robinson ; 2. Self-adjusting Helicoid ; 3. Air Meter ; 4. Circular Pressure Plate (of one square foot area) ; and 5. A special modification of Tube Anemometer. The Helicoid Anemometer is the invention of the author, who also so modified the orifice of the Tube Anemometer as to obviate the inaccuracy shown by previous experiments to be due to any inclination of the air currents. Very ingenious apparatus, fully described in the paper, was designed to make all five instruments record continuously, on one sheet of paper driven by clock-work the rate of travel, of which could be varied at pleasure from 1 inch to 3 inches per minute.

The instruments were at first mounted 9 ft. above the highest part of the roof of a house, but the eddies from the chimney stacks

and gables produced discrepancies, amounting in some instances to 30 per cent. The height was therefore increased to 18 ft. The author's conclusions are :—

“The Robinson Cups are very simple, strong, and independent of the direction of the wind ; it also appears from this investigation that the factor of the Kew Pattern type is practically constant. It is an objection that the large sizes offer great resistance to the wind, and therefore require a very strong and rigid support. During light winds the registration must depend on the order in which the instrument is kept, but I think that a Kew pattern instrument must be in a very bad and dirty condition indeed before its registration is much altered during a gale. It hardly seems necessary to add how very desirable it is that instruments of certain definite sizes and proportions only, should be made and used.”

“The Helicoid Anemometer is quite independent of friction for all excepting light winds, and different sizes read alike, but it is not so simple in construction as the cup form, and its readings are liable to be altered by comparatively slight damage to the blades.”

“The Air Meter consists of a single screw blade formed of thin aluminium and made as nearly as possible into the exact shape of a portion of a Helicoid. A similar instrument with a larger blade and with the dial protected from the weather would probably form a useful and correct Anemometer. It would be light and offer a very trifling resistance to the wind.”

“The oscillations of the pressure plate must have been considerably damped by the action of the floating weight, but as it was, they were sufficiently violent. It is perhaps a question as to how far it is desirable to allow these oscillations. The extreme pressures which occur are of very short duration, and they can only be recorded by an instrument which acts quickly. It seems probable that the remarkably high values sometimes given by the Osler Pressure Plate may be due to the inertia of the moving parts.”

“The Tube Anemometer appears to me to possess numerous advantages. The head is simple in construction and so strong that it is practically indestructible by the most violent hurricane. The recording apparatus can be placed at any reasonable distance from the head, and the connecting pipes may go round several sharp corners without harm. The power is conveyed from the head without loss by friction, and hence the instrument may be made sensitive to very low velocities without impairing its ability to resist the most severe gale. The quickness with which the recording apparatus follows the variations of the wind depends on the length and diameter of the connecting pipes, and may be altered at pleasure by a valve placed in one of them. It has been previously shown that the mean recorded seems to be independent of the size of the pipes.”

“With regard to one most important point in connection with this investigation, namely, the determination of the factor of the Kew Pattern Robinson Anemometer, these comparisons prove conclu-

sively that it must lie between 2.00 and 2.20. Reasons have been given which at least partly explain the difference of 13 per cent. between the two classes of instruments ; and if these reasons be the right ones, the record of the velocity instruments should be accepted as more likely to be correct, at any rate for the high velocities."

"I think that if 2.10 be taken as the factor, we may be certain of being within 5 per cent. of the truth, and that there is a very great probability that this value is within $2\frac{1}{2}$ per cent. of the right one."

The "Hurricane over the West Indies, August 18th—27th, 1891." by Mr. F. Watts. The author has collected a number of observations on this violent hurricane, which on August 18th, swept from the Atlantic into the Carribbean Sea, and moved in a north-north-westerly direction over San Domingo, and thence northward and eastward. At Martinique the barometer, which at 5.30 p.m. stood at 29.80 in. fell to 28.38 in. at 8.15 p.m. during the passing of the centre of the cyclone.*

METEOROLOGICAL CHANGES IN FRANCE.

MONS. FLAMMARION, the French astronomer, has recently been directing attention to the climatic changes in France. According to the United States Consul at Bordeaux, he states that, from actual figures obtained within the past six years, the temperature of Europe has been falling. France has been suffering for a long time from an excess of cold weather, the thermometrical readings at Paris having been one degree Centigrade below the normal height. Other readings show even less favourable results. The fall is more noticeable in the spring than during other periods of the year. Similar phenomena are recorded in Great Britain, Belgium, Spain, Italy, Austria, and Germany, while the really cold countries, such as Denmark, Norway, Sweden, and Russia, have enjoyed, during the last four years, a temperature slightly above the average. In the days of Philippe Auguste, in the 13th century, the wines of Etampes and Beauvais were the favourite beverages at court. Henry IV., a pronounced *bon vivant*, frequently expressed his fondness for the product of the Suresnes grape. At the present day, there is not a vineyard of importance north of Paris ; and as for the *petit vin* now made at Suresnes, it has become only the drink of the poorer classes. In the middle of the 16th century, Maçon was celebrated for its muscat wines, whereas the muscatel grape, at this moment, can scarcely be made to thrive there. Ancient chronicles mention the cultivation of the vine in Northern Brittany, where now even apples are not plentiful. Again, it is to be remarked that trees which once flourished in the north of France, are at present found only in the extreme south, and a considerable number have disappeared altogether. Languedoc no longer grows the lemon ; there is not an

* See also *Met. Mag.*, vol. xxvi. (1891) p. 167.

orange left in Roussillon. The Lombardy poplar, so familiar and picturesque an object in old French line engravings, is now nowhere to be found on French soil. These are facts which, says Consul Knowles, putting statistics out of the question, serve to illustrate the changes wrought by temperature in the great fruit-producing country of France.—*Journal of Society of Arts*, April 22nd, 1892.

SPRING DROUGHT.

To the Editor of the Meteorological Magazine.

SIR,—The deficiency of rainfall at this place and at Muswell Hill during the first four months of this year seems worthy of notice.

For those of your readers who are not acquainted with the locality, I may mention that the two stations are distant two miles “as the crow flies,” Muswell Hill being E.S.E. of Finchley; their elevation above the Thames is about 300 feet, the difference between them being probably not more than 15 feet. At Muswell Hill a record has been kept for a complete 20 years, 1872—1891; here, for the 6 years 1886—1891, too short a time to establish an average, but the difference during that period in the amount of rain between the two stations is very small, Muswell Hill exceeding this place by an average of 0·23 in. per annum.

RAINFALL AT MUSWELL HILL.							ETCHINGHAM PARK, FINCHLEY.		
Month. 1892.	Amount of rain. in.		Less than 20 years average by in.		Percentage below average.	No. of days on which rain fell.	Amount. in.		Days.
January	0·67	.....	1·59	.....	70	..... 10	0·73	.....	15
February ...	1·47	.....	0·40	.....	21	..... 19	1·62	.....	18
March	1·19	.....	0·66	.....	35	..... 10	1·28	.....	12
April	1·02	.....	0·88	.....	46	..... 11	1·05	.....	12
	4·35		3·53	=45	per cent. deficiency.	50	4·68		57

In no other year since the gauge was started has so small a quantity of R as 4·35 inches fallen from January 1st to April 30th. In 1874 the amount was 4·72 inches, and in 1891 4·97 in.

Yours faithfully,

J. W. SCOTT.

Elleray, Etchingham Park, Finchley, Middlesex, May 4th, 1892.

EXCEPTIONAL WEATHER IN MARCH AND APRIL.

To the Editor of the Meteorological Magazine.

SIR,—We have had very dry weather the last four days, and Saturday was the driest day during my ten years' observations here. At 3.15 p.m., the difference between the dry and wet bulbs was 20°·2, and the relative humidity 27. On 4th July, 1886 (details of which I sent you at the time), at 3.5 p.m., the difference between dry and wet was 22°·3 (85°·6—63°·3), but as the temperature was 16° higher, the relative humidity was 28. Moreover, the morning and evening

on Saturday were much drier than on 4th July, 1886; even at 9 p.m. there was a difference of $10^{\circ}9$, with temp. $50^{\circ}8$ I send the readings from 2 p.m. to 6 p.m., as they may be of interest. Yesterday (Sunday) the difference reached at 3 p.m. was $18^{\circ}6$ ($67^{\circ}7-49^{\circ}1$) and relative humidity 29. To-day it is very much damper, and I hope we may have some rain.—Yours very truly,

R. H. BARNES.

*Heatherlands, Parkstone, Dorset,
April 4th, 1892.*

1892. 2nd April.	Dry Bulb.	Wet Bulb.	Dew Point.	Relative Humidity.	WIND.	CLOUD.
2. 0 p.m.	68.7	50.5	36.3	31	E.N.E. 3 to 5	1. Cirrus & Cirro Stratus.
2.30 „	69.4	50.8	36.4	30	N.E. by E. 3 to 5	1. Cirrus & Cirro Stratus.
3. 0 „	69.7	49.9	34.6	27		
3.15 „	69.5	49.3	33.6	27		
3.30 „	69.0	49.1	33.6	27	E.N.E. 3 to 5	1. Cirrus & Cirro Cumulus.
4. 0 „	68.7	48.7	33.0	27		
4.30 „	68.0	48.9	33.8	29	E.N.E. 3 to 5	0. Scattered wisps of Cirrus.
5. 0 „	66.7	47.3	31.7	27		
5.30 „	64.5	46.7	32.1	29	E.N.E. 2 to 3	4. Cirrus & Cirro Stratus.
6. 0 „	61.9	46.1	32.5	33		

To the Editor of the Meteorological Magazine.

SIR,—I notice a letter in the *Times* from Mr. Sowerby respecting dryness at Regent's Park. Here it was even more remarkable. For several days the difference between wet and dry bulb has been 15° to 17° , but on Wednesday, the 6th, at 1 p.m. the readings were :—

Dry $72^{\circ}0$
Wet $53^{\circ}5$

Diff..... $18^{\circ}5$ giving a relative humidity of 31.

My instruments are in good order.

I enclose readings of max., min., and range for the week ending April 7th, and comparison with most similar previous years :—

	1892.	Max.	Min.	Range.	Cloud, 9 a.m.	Rain.
April 1		65.7	27.2	38.5	0	.00
„ 2		68.6	31.6	37.0	5	.00
„ 3		69.0	30.3	38.7	0	.00
„ 4		71.3	36.2	35.1	2	.00
„ 5		69.1	42.3	26.8	4	.00
„ 6		72.2	37.7	34.5	0	.00
„ 7		67.0	40.6	26.4	0	.00
Average 7 days ..		69.0	35.1	33.9	1.6	.00
1859.						
April 2 to 8		65.6	44.5	20.6		
1865.						
April 5 to 11		66.4	44.4	20.0		

The absolute height of maximum was exceeded on April 6th, 1859, which was 79° at Greenwich and $76^{\circ}5$ at Ross, but the mean max. for the week was much higher in 1892, and the range much greater also.

I ventured, some months since, to anticipate a warm April, on the ground that we have had an unusually long succession of cold ones. In 1859 there was a cold period from the 12th to 24th, the temperature on the 18th being 34 degrees colder than on the 6th. In 1865 the warmth continued to the close of the month. March was remarkable here for the number of frosts: 23 at 4 ft. and 29 on grass (the same as in 1883), no other year since 1859 having as many. The intensity was slightly greater in 1883. It was also remarkable for absence of cloud, the average at 9 a.m. being 4.5 only.—Truly yours,

H. SOUTHALL.

The Graig, Ross, Herefordshire, April 8th, 1892.

To the Editor of the Meteorological Magazine.

SIR,—The dryness was rather remarkable here to-day for the time of year; thermometers on Glaisher's screen:—

	Dry Bulb.	Wet Bulb.	Relative Humidity.
10 a.m.	53.0	41.0	40
12 noon	60.5	45.4	34
1 p.m.	61.5	45.5	33
2 „	61.2	45.0	33
3 „	60.7	44.8	33

Sky quite cloudless; light airs from N. and N.W.

Yours truly,

G. T. RYVES.

*Team Vicarage, Stoke-on-Trent,
March 31st, 1892.*

To the Editor of the Meteorological Magazine.

SIR,—So much snow fell here last night, that it may be of some interest (being the middle of April) to record the details. There were snow showers between 2 and 3 p.m. (15th), afterwards it was fair with sun; this morning at 5 a.m. the branches of the trees were thick with snow, and the beds of hyacinths in beautiful bloom entirely covered, and beds of tulips partially in bloom disappeared entirely in the white covering. The melted snow from the gauge at 9 a.m. was 0.85 in. The night before last the thermometer was at 24° , unpleasing spring weather for Easter-tide.—Yours very truly,
BESSIE METCALFE.

Harbledown, Canterbury, April 16th, 1892.

To the Editor of the Meteorological Magazine.

SIR,—We had extreme dryness here on April 3rd; at 1.30 p.m. the dry bulb read 69° , wet bulb 51° , so that the relative humidity was only 31. Heavy snow here on 15th and 16th. Snow began falling

about 9 p.m. on 15th and continued to 9 a.m. on 16th. Depth on Stevenson screen, $3\frac{1}{2}$ inches ; average depth on ground, 4 in. giving

Depth.	Water.	Ratio.
4.00 in. ....	.60 in.	$6\frac{1}{2}$ to 1
Max. on 16th	45° 0	Min. 32° 6

Considerable damage to telegraph and telephone systems, the number of poles "down" unprecedentedly large. Fall of temperature from 70° 3 on 6th, to 29° 5 on 15th, or 40° 8 in 9 days.—Yours, &c.,
F. H. PHILLIPS.

1, Prestonville Road, Brighton, April 18th, 1892.

To the Editor of the Meteorological Magazine.

SIR,—The following readings of the maximum thermometer at the beginning of April may be of interest to some of the readers of your Magazine, or for comparison with other readings :—

March 31st.....	66° 5	April 3rd	69° 0
April 1st.....	75° 1	„ 4th	67° 4
„ 2nd	70° 0		

The air on March 31st was very dry, as shown by the wet and dry bulb thermometers ; at 11 a.m., the dry and wet stood at 57° 2 and 40° 2 respectively, giving a relative humidity of 28. Snow was lying unmelted in the shadows.—Yours truly,

WALTER E. STEWART.

*Elcott House, Hurworth-on-Tees, Darlington,
May 4th, 1892.*

To the Editor of the Meteorological Magazine.

SIR,—The following figures will give you an idea of the severity of the weather this Easter. My thermometer is 4 feet from the ground, and in a case ; on Good Friday night I put another one on the grass and it fell to 10°.

	Max.	Min.		Max.	Min.
April 14th	44.0	21.0	April 17th	46.0	19.5
„ 15th	46.0	19.5	„ 18th	47.0	21.5
„ 16th	48.0	20.0	„ 19th	49.7	21.8

—Yours truly,

ROBERT A. CLARKE.

*Norwood Cottage, Casterton, Kirkby Lonsdale,
April 20th, 1892.*

THE WEATHER IN MID-SUSSEX on Saturday morning, April 16th, would have been much more in harmony with Christmas than Easter. About 4 inches of snow had fallen, and was driven by a strong N.W. wind with great fury. Every twig was coated with snow, and evergreens were weighed down to the ground. It has been followed by sharp frosts. Gooseberries are in full bloom but well in leaf, and do not seem to have suffered. Pear blooms out on E. aspect wall under fish nets are destroyed, and I fear that the plums will share the same fate.—R. I. [Near Hawkhurst the snow was a foot deep.]

FROST AND SNOW IN THE ISLE OF WIGHT.—The weather here lately has been very wintry. The tops of the hills behind Ventnor are covered with snow—a very unusual thing for this part of the country at this time of the year. We have sharp frosts every night. On Friday night, 15th, it fell to 26°, which blackened all the early potatoes, and must do severe injury to the blossom of the early fruit trees. The tops of the asparagus are killed, and altogether it will make a very backward spring still later. Summer visitors are here, but having a very cold reception. The cuckoo and the nightingale were heard last week, and yesterday (the 17th) I saw the first swallow, so we ought soon to have better weather.

C. ORCHARD.

THE WEATHER IN HAMPSHIRE.—This has undergone a complete change during the last eight days, as it has in other localities. The first eleven days in the month produced a temperature of 70° in the shade, and over; on the 10th, 76° was registered, the nights being really warm for the time of year, on the night of the 6th the lowest reading being 48°, and vegetation moved rapidly. During the night of the 12th the temperature fell to freezing point, and since then we have had nightly frosts of great severity. This morning (April 18th) at 6.30, we had a temp. of 22°. I fear the early promise of a full fruit crop will not be realized, as I note that the unopened buds of pear trees are blackened. The early blossom of plums and cherries on walls is in an equal plight. Rain is needed for newly-sown seeds and plants just put out, scarcely any having fallen for a month.—E. M.

Journal of Horticulture.

TOWN FOGS.

To the Editor of the Meteorological Magazine.

SIR,—I am glad to see (p. 42) Mr. Slatter's letter on the mode of recording fogs; but it occurs to me that there are other points which ought to be noted if exact records are to be kept. Some fogs are denser near the ground than at a little altitude, while in other instances the reverse is the case; also they are sometimes denser in one direction than in another. My plan has been to record the fog on a scale depending on the distance of the *furthest* terrestrial object I could see at any altitude or in any direction; but I perceive now that this is not consistent, and that if we want to know the amount of fog at the exact point of observation, we should observe an object at the same altitude, recording what we deem would be the distance visible if there was a uniform fog equal to that existing at the point of observation—sometimes fogs are very far from uniform. It is also a matter of meteorological interest what the density is in different altitudes and azimuths.

T. W. BACKHOUSE.

Sunderland, April 28th, 1892.

REVIEW.

Étude sur le Climat de Pau et du Sud-ouest Français, par le DR. E. DUHOURCAU de Cauterets. [Mémoire lu au Congrès de l'Association Pyrénéenne (Bordeaux, Mai, 1891).] Toulouse, Privat 1891, 8vo. 26 pages.

THIS pamphlet may be described in brief as drawing attention to all the good points in the climate of Pau, and attacking those persons who have called attention to any points which tell against it. We do not regard this as either a judicial or judicious way to treat the subject, and we shall certainly not take any part in the controversy. We are much indebted to Dr. Duhourcau for sending a copy, for papers by him are always worth reading (some of the quotations in the present are quite amusing, *e.g.*, a *calori-soustractionomètre* suggested by M. Piche), and though last, by no means least, because the pamphlet contains a table so useful that we have converted into English measures and reprinted all the values except those for the hygrometer, for which the returns are too rarely given to afford satisfactory data for comparison.

Three Years Meteorology at Paris and in the S. and S.W. of France.

STATION.		MEAN DAILY MAX.				MEAN DAILY MIN.				TOTAL DAYS WITH FROST.	MEAN CLOUD AT NOON.			
		Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.		Winter.	Spring.	Summer.	Autumn.
Paris	1888	38°·8	56°·3	71°·2	59°·2	30°·0	39°·9	52°·9	42°·4	67	7	8	7	6
„	1889	41°·9	57°·7	76°·1	58°·6	30°·0	41°·2	54°·5	42°·6	66	7	7	6	6
„	1890	42°·6	60°·3	72°·0	58°·5	32°·5	40°·6	52°·2	42°·4	63	7	6	7	6
Arcachon ..	1888	49°·6	67°·8	77°·9	68°·5	36°·1	46°·9	57°·2	48°·7	?	...	...	...	...
„	1889	48°·9	60°·1	77°·4	66°·2	38°·7	44°·2	58°·6	49°·6	27	...	...	...	...
„	1890	49°·3	62°·1	77°·2	64°·9	36°·9	44°·4	57°·7	47°·1	33	...	...	...	...
Bayonne	1888	48°·6	59°·5	76°·3	66°·7	34°·2	43°·2	56°·5	49°·1	36	8	6	5	5
„	1889	50°·7	59°·5	75°·9	66°·9	36°·3	43°·3	57°·4	47°·1	27	7	6	5	7
„	1890	53°·2	60°·1	75°·4	64°·2	35°·4	44°·1	58°·1	50°·5	43	6	6	6	5
Biarritz	1888	48°·9	59°·5	74°·3	67°·1	37°·8	43°·9	58°·1	51°·6	20	7	6	5	6
„	1889	51°·8	58°·6	74°·5	66°·7	39°·7	47°·5	60°·8	51°·8	21	7	6	5	5
„	1890	53°·2	60°·8	73°·4	64°·6	39°·0	47°·7	60°·8	51°·3	20	6	6	6	5
Pau	1888	44°·6	62°·8	77°·7	66°·0	34°·2	40°·6	52°·2	42°·3	63	6	5	5	4
„	1889	50°·5	65°·7	76°·6	64°·8	33°·3	44°·6	55°·9	43°·7	49	6	7	6	5
„	1890	51°·8	65°·7	77°·7	65°·1	32°·2	40°·3	53°·8	43°·2	61	6	7	6	5
Bagnères de	1888	44°·2	59°·2	71°·2	61°·9	33°·1	36°·7	51°·6	45°·5	56	7	6	7	6
Bigorre ...	1889	47°·5	55°·4	71°·4	63°·0	33°·3	39°·0	54°·3	45°·1	55	6	8	7	5
„	1890	47°·8	57°·7	72°·7	61°·3	32°·4	40°·3	52°·9	43°·5	52	6	5	6	5
Nice	1888	49°·8	60°·8	75°·9	65°·8	36°·3	45°·7	59°·2	50°·5	16	...	...	...	...
„	1889	52°·2	60°·1	78°·8	65°·8	37°·6	45°·0	58°·8	50°·2	14	...	...	...	...
„	1890	51°·3	62°·8	76°·3	63°·9	38°·7	45°·3	60°·1	47°·7	9	6	6	4	6

Three Years Meteorology at Paris and in the S. and S.W. of France.

STATION.		RAIN.										
		DEPTH.					DAYS.					
		Winter.	Spring.	Summer.	Autumn.	Total.	Winter.	Spring.	Summer.	Autumn.	Total.	
		in.	in.	in.	in.	in.						
Paris	1888	4·13	3·32	8·23	4·22	19·90	15	48	46	30	139	
„	1889	3·90	6·34	5·12	5·32	20·68	30	46	33	41	150	
„	1890	3·54	4·37	8·11	4·26	20·28	24	33	43	52	152	
Arcachon	1888	5·98	5·71	8·15	10·16	30·00	50	?	48	36	?	
„	1889	10·72	10·75	4·16	14·40	40·03	54	55	51	57	217	
„	1890	6·69	7·90	5·73	12·00	32·32	31	49	33	?	?	
Bayonne ..	1888	10·15	8·88	12·05	12·81	43·89	21	34	33	34	122	
„	1889	20·16	14·04	11·73	18·05	63·98	39	46	35	41	161	
„	1890	11·25	14·13	7·13	15·30	47·81	30	48	24	30	132	
Biarritz ...	1888	11·02	10·73	13·23	14·45	49·43	40	38	40	35	153	
„	1889	17·32	13·86	12·28	18·13	61·59	51	46	43	41	181	
„	1890	10·30	13·46	6·61	15·47	45·84	30	48	24	30	132	
Pau	1888	7·21	14·60	13·78	8·66	44·25	32	43	45	30	150	
„	1889	16·93	19·69	14·11	13·35	64·08	44	68	39	32	183	
„	1890	7·93	16·83	11·89	10·59	47·24	26	51	35	31	143	
Bagnères de	1888	5·31	7·57	13·43	8·63	34·94	19	?	60	49	?	
Bigorre	1889	19·63	16·70	5·33	10·98	52·64	30	50	52	42	174	
„	1890	7·50	14·54	10·93	18·94	51·91	30	50	40	45	165	
Nice	1888	2·01	8·19	3·11	16·06	29·37	8	27	16	24	75	
„	1889	7·24	9·02	4·96	15·20	36·42	19	31	15	26	91	
„	1890	6·62	19·33	2·17	6·02	34·14	9	31	5	18	63	

N.B.—For Paris in 1888 and Pau in 1890 there is a mistake or misprint in the rainfall. We have given above the sum of the seasons, but the totals as printed give for the year 1888 at Paris 23·43, and for 1890 at Pau 43·31 inches.

Sequence of Stations according to Dr. Duhourcau's Table.

Mean Min. in Winter.	Days with Frost.	Total Rain.	Days with Rain.
Paris..... 30°·8	Paris..... 65	in. 52·29	Pau ... 159
Bagnères. 32·6	Pau 58	Bayonne. 51·90	Biarritz. 155
Pau 33·2	Bagnères 54	Pau 51·86	Paris 147
Bayonne. 35·3	Bayonne. 35	Bagnères. 46·50	Bayonne 138
Arcachon 37·2	Biarritz.. 20	Arcachon 34·12	Nice ... 76
Nice ... 37·5	Nice 13	Nice 33·31	
Biarritz.. 38·8		Paris..... 20·29	

The winter min. is therefore 5°·6 lower at Pau than at Biarritz, and the frosts at Pau are to those at Biarritz as 58 to 20. We had no idea that it was so cold.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, OCTOBER, 1891.

STATIONS. (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain.		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
	°		°		°	°	°	0-100	°	°	inches		
England, London	65·9	9	29·7	31	58·3	45·0	46·3	84	104·0	24·4	4·80	20	5·6
Malta.....	88·4	6	57·5	24	77·5	65·4	62·8	81	144·0	51·2	1·85	10	3·8
Cape of Good Hope ...	87·6	20	44·5	23	70·3	53·1	...	...	...	...	·28	3	2·6
Mauritius.....	82·0	31	64·0	21	78·1	67·4	63·9	77	134·0	53·8	1·34	14	5·9
Calcutta.....	90·2	6	67·7	28	87·3	73·1	72·7	79	148·7	60·5	·10	1	2·0
Bombay.....	91·9	26	73·2	30	88·8	76·4	73·3	74	140·0	61·7	1·04	3	2·2
Ceylon, Colombo	86·7	8	72·5	8	84·1	74·3	72·3	81	149·5	67·3	35·28	29	9·4
Melbourne.....	84·2	24	38·0	14	65·4	48·7	47·1	71	136·0	30·2	3·04	14	6·3
Adelaide	93·5	25	37·6	15	70·9	52·8	46·1	56	158·0	30·0	2·52	15	5·6
Tasmania, Hobart.....	84·0	24	34·0	14	62·2	44·7	46·5	75	140·0	25·2	2·77	18	7·0
Wellington .....	...	...	...	...	...	...	...	...	...	...	...	..	...
Auckland	69·0	28	48·0	27	64·1	51·9	48·8	72	138·0	41·0	2·64	11	4·9
Jamaica, Kingston.....	91·7	24	70·3	29	87·1	74·0	71·5	78	...	...	9·10	...	...
Trinidad	92·0	2	66·5	3	89·0	71·1	73·3	82	...	66·0	5·77	...	...
Toronto	80·7	3	21·6	28	56·1	39·1	41·6	74	...	15·0	1·71	11	5·2
New Brunswick, Fredericton	79·7	3	17·3	29	52·0	34·6	39·0	79	...	...	4·70	11	5·8
Manitoba, Winnipeg ...	68·0	29	19·2	15	51·4	30·6	34·8	80	...	...	1·19	14	5·8
British Columbia, Esquimalt	69·6	7	38·5	1	57·3	45·1	49·8	97	...	...	2·04	20	6·6

REMARKS.

MALTA.—Mean temp. 69°·8; mean hourly velocity of wind 9·2 miles. The temp. of the sea fell from 76°·3 to 71°·0. Thunderstorms occurred on 5 days; lightning was seen on 8 other days. J. SCOLES.

Mauritius.—Mean temp. of air 0°·6 above, dew point 2°·2 above, and rainfall ·49 in. below, their respective averages. Mean hourly velocity of wind 9·5 miles, or 2·0 below average; extremes, 22·2 on 12th and 0·0 on 18th, 19th and 29th; prevailing direction E. by S. C. MELDRUM, F.R.S.

CEYLON.—Thunderstorms occurred on 16 days, and lightning was seen on 5 other days. F. J. DAY, Maj., R.E.

Melbourne.—Mean temp. of air same as the average of 33 years; mean temp. of dew point 0°·8, humidity 2, amount of cloud 0·3, and rainfall ·26 in., above their respective averages. Prevailing winds S. and N., strong on 11 days. Heavy dew on 6 days; hail on 17th; lightning on 28th; thunderstorm on 29th.

Adelaide.—Mean temp. 0°·1 below the average of 34 years; rainfall ·69 in. above the average. R. L. J. ELLERY, F.R.S. C. TODD, F.R.S.

Auckland.—An unusually fine and dry month, the rainfall being rather more than ·75 in. below, the average; mean temp. slightly above, the average.

T. F. CHEESEMAN.

SUPPLEMENTARY TABLE OF RAINFALL, APRIL, 1892.

[For the Counties, Latitudes, and Longitudes of most of these Stations,
see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger Hall.	1·19	XI.	Builth, Abergwessin Vic.	2·09
	Birchington, Thor	1·30		Rhayader, Nantgwillt..	1·50
	Brighton, Prestonville Rd	1·31		Corwen, Rhug	·88
	Hailsham	1·46		Carnarvon, Cocksidia ...	1·45
	Ryde, Thornbrough	1·00		I. of Man, Douglas	1·73
	Alton, Ashdell	·88	XII.	Stoneykirk, Ardwell Ho.	1·23
III.	Oxford, Magdalen Col...	·72		New Galloway, Glenlee	1·28
	Banbury, Bloxham	·75		Melrose, Abbey Gate...	1·65
	Northampton, Sedgebrook	·79	XIII.	N. Esk Res. [Penicuick]	·90
	Cambridge, Fulbourne..	2·34		Edinburgh, Blacket Pl..	1·11
	Wisbech, Bank House..	1·87	XIV.	Glasgow, Queen's Park.	·67
IV.	Southend	1·19	XV.	Islay, Gruinart School..	1·23
	Harlow, Sheering ...	1·06	XVI.	Dollar.....	1·03
	Rendlesham Hall	2·27		Balquhiddier, Stronvar..	1·75
	Diss	1·64		Coupar Angus Station..	·55
	Swaffham	·84		Dunkeld, Inver Braan..	...
V.	Salisbury, Alderbury ...	·62		Dalnaspidal H.R.S. ...	2·15
	Bishop's Cannings	·71	XVII.	Keith H.R.S.	·75
	Blandford, Whatcombe.	1·04		Forres H.R.S.	·91
	Ashburton, Holne Vic. ...	1·52	XVIII.	Fearn, Lower Pitkerrie.	1·27
	Okehampton, Oaklands.	1·49		Loch Shiel, Glenaladale	3·48
	Hartland Abbey	2·40		N. Uist. Loch Maddy ...	1·69
	Lynmouth, Glenthorne.	1·82		Invergarry	1·84
	Probus, Lamellyn	1·43		Aviemore H.R.S.	·83
	Wincanton, Stowell Rec.	1·18		Loch Ness, Drumnadrochit	1·58
	Clevedon, Charleville ...	...	XIX.	Lairg H.R.S. ....	...
VI.	Bristol, Clifton .....	...		Scourie	1·97
	Ross, The Graig	·92		Watten H.R.S.	1·48
	Wem, Clive Vicarage ...	1·29	XX.	Dunmanway, Coolkelure	2·53
	Cheadle, The Heath Ho.	1·00		Fermoy, Gas Works ...	1·36
	Worcester, Diglis Lock	·55		Killarney, Woodlawn ...	1·61
	Coventry, Coundon	·79		Tipperary, Henry Street	1·24
VII.	Ketton Hall [Stamford]	·85		Limerick, Kilcornan ...	1·08
	Grantham, Stainby	1·53		Ennis	·83
	Horncastle, Bucknall ...	1·62		Miltown Malbay.....	1·47
	Workshop, Hodsck Priory	·72	XXI.	Gorey, Courtown House	1·16
VIII.	Neston, Hinderton	1·49		Mullingar, Belvedere...	1·31
	Knutsford, Heathside...	1·20		Athlone, Twyford	1·06
	Lancaster	2·04		Longford, Currygrane...	1·06
	Broughton-in-Furness..	2·40	XXII.	Galway, Queen's Coll...	1·66
IX.	Ripon, Mickley	1·72		Crossmolina, Enniscoo..	2·65
	Scarborough, West Bank	1·26		Collooney, Markree Obs.	1·52
	East Layton [Darlington]	·97		Ballinamore, Lawderdale	1·26
	Middleton, Mickleton..	·88	XXIII.	Lough Sheelin, Arley ..	1·13
X.	Haltwhistle, Unthank..	1·41		Warrenpoint	·92
	Bamburgh	·92		Seaforde	·99
	Newton Reigny	1·08		Belfast, New Barnsley..	1·44
XI.	Llanfrechfa Grange	1·12		Bushmills, Dundarave...	1·84
	Llandovery	1·58		Stewartstown	·75
	Castle Malgwyn	1·07		Buncrana	1·63
				Lough Swilly, Carrablagh	1·22

APRIL, 1892.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.					Days on which "01 or more fell.	TEMPERATURE.				No. of Night below 32°	
		Total Fall.	Difference from average 1880-9.	Greatest Fall in 24 hours		Max.		Min.	In shade.	On grass.			
				Dpth	Date						Deg.	Date.	
		inches.	inches.	in.			Deg.	Date	Deg.	Date.			
I.	London (Camden Square) ...	.99	— .75	.27	27	9	73.0	4	28.2	17	7	20
II.	Maidstone (Hunton Court)...	1.82	+ .17	1.10	15	11	...	...	...	...	...	...
III.	Strathfield Turgiss .....	.83	— .77	.15	20	10	70.6	4	23.3	17	15	25
III.	Hitchin .....	.91	— .88	.42	28	11	70.0	5	25.0	13	17	...
IV.	Winslow (Addington) .....	.57	— 1.35	.14	27	8	71.0	6	23.0	30	15	22
IV.	Bury St. Edmunds (Westley)	1.62	— .04	.39	27	7	67.0	4	22.0	14	...	...
V.	Norwich (Cossey)	1.89	+ .18	.82	16	13	64.0	2, 4	21.0	15	18	...	
V.	Weymouth (Langton Herring)	1.13	— .75	.51	20	10	66.0	9	28.0	15	7	...	
VI.	Torquay, Babbacombe .....	.85	— 1.39	.48	28	8	66.9	4	26.4	15	3	12
VI.	Bodmin (Fore Street)	2.14	— .93	.75	15	14	...	...	...	...	...	...
VI.	Stroud (Upfield) .....	.89	— 1.26	.29	13	13	68.0	10	26.0	14	6	...
VII.	Churchstretton (Woolstaston)	.89	— 1.45	.24	12	8	67.0	3	24.5	13	9	18	
VII.	Tenbury (Orleton) .....	.99	— 1.09	.37	13	10	71.2	6	22.5	15	15	19
VII.	Leicester (Barkby) .....	.85	— 1.25	.30	27	8	74.0	5	19.0	13	20	24
VIII.	Boston	1.41	— .30	.38	27	9	76.0	5, 6	22.0	14	11	...	
VIII.	Hesley Hall [Tickhill]	1.09	— .62	.37	14	8	71.0	2	20.0	19	18	...	
VIII.	Manchester (Plymouth Grove)	1.22	— .49	.33	27	12	71.0	3	24.0	13	11	16	
IX.	Wetherby (Ribston Hall) ...	.95	— .90	.45	28	5	...	...	...	...	...	...
IX.	Skipton (Arncliffe)	2.84	— .59	.92	27	14	74.0	2	17.0	15	...	...
X.	Hull (Pearson Park)	2.08	+ .16	.48	27	14	69.0	4	24.0	19	14	18	
X.	Newcastle (Town Moor)	1.15	— .68	.43	27	15	...	...	...	...	...	...
X.	Borrowdale (Seathwaite)	3.91	— 3.23	1.02	27	14	...	...	...	...	...	...
XI.	Cardiff (Ely)	1.74	— .67	.53	20	9	...	...	...	...	...	...
XI.	Haverfordwest	2.16	— .47	.48	25	16	68.8	11	24.0	16	8	18	
XI.	Aberystwith, Gogerddan	1.85	— .71	.51	20	10	74.0	2	17.0	15	14	...	
XII.	Llandudno	1.06	— .75	.34	24	14	...	...	...	...	...	...
XII.	Cargen [Dumfries] .....	.76	— 1.47	.39	26	7	67.4	3	21.8	15	c	13
XII.	Jedburgh (Sunnyside) .....	.92	— .78	.39	27	7	71.0	2	21.0	19	14	...
XIV.	Old Cumnock	1.06	— 1.07	.37	26	10	...	...	...	...	...	...
XV.	Lochgilthead (Kilmory)	1.94	— .87	.32	26	15	...	...	20.0	16	12	...
XV.	Oban (Craigvarren)	1.83	...	.38	26	15	65.2	8, 12	26.2	14	5	...
XV.	Mull (Quinish)	1.99	— .99	.55	19	15	...	...	...	...	...	...
XVI.	Loch Leven Sluices .....	.90	— 1.32	.40	28	4	...	...	...	...	...	...
XVI.	Dundee (Eastern Necropolis)	.70	— 1.35	.30	27	10	69.5	2	23.5	15	10	...	
XVII.	Braemar .....	.81	— 1.61	.30	27	12	66.7	4	11.0	16	17	22
XVII.	Aberdeen (Cranford)	1.12	...	.45	27	15	71.0	1	18.0	15	10	...
XVIII.	Strome Ferry	1.72	— 1.20	.30	20	15	...	...	...	...	...	...
XVIII.	Cawdor [Nairn]	1.17	— .35	.36	27	12	...	...	...	...	...	...
XIX.	Dunrobin	2.17	+ .44	.49	27	13	57.0	5	25.0	15	9	...	
XIX.	S. Ronaldsay (Roeberry)	2.63	+ 1.02	.68	27	19	62.0	2	28.0	12	d	11	
XX.	Darrynane Abbey	2.22	...	.53	4	17	...	...	...	...	...	...
XX.	Waterford (Brook Lodge) ...	.98	— 1.49	.31	28	13	64.5	2, 10	25.0	19	...	...
XX.	O'Briensbridge (Ross)	1.12	...	.31	24	13	65.0	11	29.0	19	9	...
XXI.	Carlow (Browne's Hill)	1.24	— 1.04	.30	28	12	...	...	...	...	...	...
XXI.	Dublin (Fitz William Square)	1.11	— 1.01	.41	24	13	63.8	20	27.3	15	5	14	
XXII.	Ballinasloe	1.08	— 1.26	.33	24	13	63.0	3, 7	26.0	14	e	9	
XXII.	Clifden (Kylemore)	3.23	...	.71	24	14	...	...	...	...	...	...
XXIII.	Waringstown .....	.98	— 1.44	.15	20a	15	72.0	3	21.0	15	f	11
XXIII.	Londonderry (Creggan Res.)	1.17	— 1.07	.19	26	15	...	...	...	...	...	...
XXIII.	Omagh (Edenfel) .....	.84	— 1.39	.21	26	15	65.0	3	21.0	15	9	11

a And 26. b And 15, 17. c And 16. d And 13. e And 16, 19. f And 19.

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

METEOROLOGICAL NOTES ON APRIL, 1892.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; 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.

STRATHFIELD TURGISS.—The first fortnight was very dry, cold at night, and very hot in the middle of the day; on the 4th and 5th the max. was the highest recorded at this station in April. The middle and close of the month were similar in character, but very cold at night. Swallows seen for the first time on 6th; cuckoo heard on the 17th; nightingale on the 22nd; spotted fly-catcher seen on 25th.

HITCHIN.—The max. on 5th is the highest temp. ever recorded here so early in the year.

ADDINGTON.—The least April rainfall registered here; only once before has less than one inch fallen (i.e., .59 in 1881). During the first week the day temp. was high, but the nights were cold throughout, and often very sharp, minima of 25° or under, occurring on 6 nights. On the 13th a good deal of S fell; on 25th aurora was seen between 9 and 10 p.m. First swallow seen on 21st; cuckoo heard on 25th (both late dates.)

BURY ST. EDMUNDS, WESTLEY.—The early part of the month was very mild; the middle and last three days very cold. Migratory birds rather later than usual; 19 days of northerly wind; vegetation backward. S on 12th, 15th, 16th and 27th; T on 15th.

LANGTON HERRING.—Another dry month, making for the four months of this year only 5.15 in. of R on 45 days, the deficit being a little over 50 per cent., or 5.17 in. Less R has fallen in the last four months than in the corresponding period of any year since 1875, when observations commenced. The changes of temp. were abnormally great. The heat of the days from 6th to 11th, and the coldness of the nights from 15th to 20th being unprecedented in 20 years. The mean temp. of the month was very slightly in excess of the average. The weather was very fine from 1st to 12th; fog on 4th and 5th; solar halo on 8th and 24th; T on 18th.

TORQUAY, BABBACOMBE.—A warm, very dry, fine, sunny, month, with great excess of N.E. wind, large daily range and variability of temp., and a high bar. No rain was gauged in the 17 days from March 27th to April 12th; only .01 in. (on March 26th) fell in the 27th days, March 17th to April 12th, and only .24 in. (on 6 days) in the 41 days, March 17th to April 26th. Showery from April 13th to 21st (with H and S from 14th to 18th), and 25th to 29th, fine and sunny from 1st to 3rd, 6th to 12th and on 23rd, 24th and 30th; warm from 1st to 12th and 21st to 26th, especially on 6th, when the mean of 9 a.m. and 9 p.m. max. and min. temp. was 54°·9; cold from 13th to 19th and on 29th and 30th, especially on 15th, when the mean temp. was 36°·6. The max. shade temp. rose to or above 60° on 9 days. The air was very dry on 1st (humidity at 9 a.m. 43) and 11th (humidity at 3.10 p.m. 41.) The average max. in shade (56°·3) was higher than in any of the preceding 15 Aprils. The total R, 5.70 in. and wet days 45 of the first four months of this year, are the least registered in any year. No gales blew; S fell on 14th, 16th, 17th and 18th, but did not cover the ground; H on 13th, 16th and 18th; aurora borealis on 23rd and 25th; solar halos on 10 days, with parhelia on 2 days; fog on 4th and 5th.

BODMIN.—Very dry and pleasant weather to the 13th, some days very hot, especially the 6th and 10th. S on 13th, a heavy fall on the 15th and 16th, and a little on the 17th, then showery and rather cold to the 28th.

STROUD, UPFIELD.—S fell all day on the 13th, and in showers on the 14th 15th and 16th. S on the hills on 14th and 18th. First swallow seen on the 15th; N.E. winds on 8 days; N.W. on 13 days.

WOOLSTASTON.—A cold and very backward month with much frost. S fell heavily on the 12th and the two following days. The rainfall was very slight. Mean temp. 45°·7.

TENBURY, ORLETON.—A month with great and sudden extremes of temp.

The daily max. were unusually high from the 1st to the 11th, 4 days being above 70°, and the lowest 63°. From the 12th to the 18th the highest max. was 49°·8. and the lowest 37°·2. Altogether there were 15 days with a max. over 60°, against 4 last year; 3 in 1890, and 3 in 1889. S fell on the 12th, 13th, 14th, 16th and 18th. Aurora borealis was seen on the 25th; cuckoo heard on the 24th; cherries and damsons in full blossom about the 27th.

LEICESTER, BARKBY.—A very cold and dry month, with continuous, late and damaging frosts, which destroyed almost all fruit blossom. The first week was warm during the day. First swallow seen on the 7th; first cuckoo heard on the 28th. Four inches of S on the 12th, 13th and 14th.

MANCHESTER, PLYMOUTH GROVE.—Summer weather on the 3rd, 4th and 10th; S showers on the 14th, 15th, 17th and 18th; thick fog on the mornings of the 11th and 14th; fine weather on the 7th, 8th and 9th, and from 21st to 26th; squally and bitterly cold on the 28th. Mean temp. 45°·3.

HULL, PEARSON PARK.—TS with showers of H and R on the 25th; T on 18th; S on 12th, 14th, 15th and 18th.

WALES.

HAVERFORDWEST.—The first four days of the month were of the same wintry character as March, when a sudden change to great and almost unprecedented heat, for so early in the year, took place; it was warm even up to a late hour in the evening, especially on the 10th, when, at 8 p.m., the ther. registered 64° in screen. After this a sudden change back to cold occurred, with severe frost and frequent showers of S, especially on the 16th, when a blinding S storm took place, covering the ground to a depth of three inches, and cold weather with S showers continued to the end of the month. Vegetation very backward.

SCOTLAND.

CARGEN.—The temp. of the month was very variable; the mean. for the first eleven days was 48°·4 (2°·6 above the average for the whole month) notwithstanding, five nights were very cold. For the following eight days—12th to 19th—the mean. temp. was only 36°·2; the mean temp. of the month was 1°·7 below the average. The duration of sunshine (206 hours) was much above the average. The R for the first 4 months of the year is 7·27 in. below the average. A very marked solar halo was observed in the afternoon of the 19th, and a brilliant display of the aurora on the night of the 24th. S fell on 13th and 15th, and sleet on 26th.

JEDBURGH, SUNNYSIDE.—The weather was bitterly cold during the greater part of the month—the night temp. being very low, but there was a good deal of sunshine during the day. Vegetation made little progress. About an inch and a half of S fell on 12th and 13th.

OLD CUMNOCK.—T and H on the 15th; slight S on the 13th and 16th. Grand display of aurora borealis at 10 p.m. on the 25th.

OBAN.—The first quarter of the month was warm and sunny, the remainder was exceptionally cold and disturbed.

CAWDOR [NAIRN].—S showers on 12th, 13th, 15th, 17th and 26th.

S. RONALDSAY, ROEBERRY.—The first part of the month was fine, the middle and latter part wet, stormy and cold.

IRELAND.

DARRYNANE ABBEY.—The first ten days were mild and spring-like, the next ten very cold, and the remainder changeable; T on the 7th; S showers on 15th and 16th.

WATERFORD, BROOK LODGE.—The driest April since 1870. A cold, backward month; prevailing winds easterly; H on the 13th and 15th; T on the 15th; fog on the 20th; sea fog on the 21st; S on the Comeragh Mountains on 29th. First swallow seen on the 23rd; cuckoo heard on the 27th.

O'BRIENSBRIDGE, ROSS.—Temp. rather low for the season, but a very full allowance of sunshine. Many brilliant days up to the 20th, and again at the close of the month; but N. & N.E. winds, with slight frosts at night, kept vegetation backward.

DUBLIN.—A cold, rather dry and March-like month. The mean temp., R, and rainy days were all below the average. On six days the temp. rose above 60° in the shade, but on five nights it fell below 32°. Mean temp. 46°·2 or 1°·5 below the average. Solar halos on the 7th and 30th; lunar halo on the 7th; fogs on 10 days; high winds on 3 days; S or sleet on 5 days; H on 8 days. The temp. exceeded 50° in the screen on 24 days, compared with 18 days in April, 1891.

EDENFEL.—During the first 12 days there occurred a spell of genuine summer weather, with southerly winds and clear skies and a higher mean temp. than has been before recorded here for the same period; but on the 13th these conditions were suddenly reversed, and a week of bitter polar and easterly winds followed, accompanied by occasional light drifting S and severe night frosts; the min. in shade on 15th (21°) being the lowest recorded here in April. From the 20th to the end of the month the weather somewhat improved, with fresh, cool airs, and alternate light S, H and R. The drought remained practically unbroken to the close; the total rainfall for the month reaching about one-third of the average, and for the four months to May 1st about one-half.

THE CLIMATE OF TROPICAL AFRICA.

At the Cardiff meeting of the British Association attention was drawn to the importance of knowledge of the climate of Tropical Africa, and a committee, consisting of the undersigned, was appointed to collect information upon the subject and to render it generally accessible.

Our work consists of two branches—(1) the collecting and epitomizing such records as have been made; (2) endeavouring to secure the establishment of a network of stations throughout that vast region; not merely the British portion, but right across the continent, because, happily, scientific men of different nations rarely fail to be good friends and to co-operate in work which is for the benefit of all.

The task is a large one, and the fund at our disposal (£75) extremely small, but we hope to render a good account of our stewardship.

We commence our work by making a request, and an offer.

We request information of all trustworthy and regular meteorological observations made in Tropical Africa, and the loan of any unpublished *data* of that nature. (We are ourselves tabulating all those known to us, but doubtless there are some of which we have not heard).

We shall be happy to supply instructions for observing and blank forms for the entry of observations to all residents in that portion of Africa who will undertake to observe regularly and to return to us their forms duly filled up.

We do not dwell upon the importance of the subject either with respect to agriculture or to the engineering works which will have to be carried out in that country, because it appears to us to be so obvious that it would be waste of space to dwell upon it.

All communications should be sent to the Secretary at 62, Camden Square, N.W.

E. G. RAVENSTEIN, *Chairman*.

BALDWIN LATHAM.

G. J. SYMONS, *Secretary*.