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ANEMOMETERS.

IF any branch of meteorology is in an unsatisfactory condition, it certainly is anemometry—and this, we think, arises from causes not easily removed. In this and following articles we purpose describing the principal instruments now actually used for measuring the movements of the wind; but we think a few prefatory words on the present condition of anemometry necessary to a due application of our subsequent descriptions. The two most serious obstacles to extensive, simultaneous and fruitful anemometrical research are (1) the cost of effective anemometers, and (2) the labour of reducing the records when obtained.

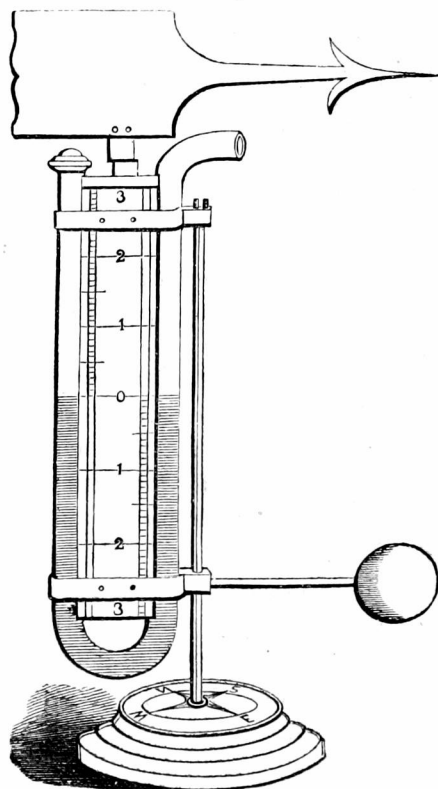
Concerning the first point, information will be given when each instrument is described; but we may premise that any one contemplating the erection of a *complete* anemometer must be prepared to spend £50; possibly opticians may differ from us there; be it so, we shall be glad to find that they are prepared to provide the instrument, transport it to its destination, erect it, and leave it in perfect working order, with recording sheets, forms for tabulating the observations, and all the inevitable et ceteras complete for a less sum; first-class instruments cost from £100 to £200.

The labour of reducing the record sheets to numerical values is also very considerable. It is not, therefore, surprising that there are in various parts of the British Isles stores of anemometrical records for many years past which await, and perhaps will long continue to await, the discussion which they ought to have received. Believing that very much may be done with these old observations, we appeal to all who possess them, and earnestly request them to make arrangements for their publication. And at the outset we would impress on our readers that it is far more useful to have a simple instrument, and thoroughly discuss its indications, than it is to establish an apparatus yielding results which the owner has not time to reduce.

Taking first the simplest form of wind measure, we have that known

as Lind's anemometer, (fig. 1), invented in 1775, the principle of which is very simple, being merely the measurement of the length of a column of water, which is supported by the direct pressure of the wind. Inspection of the figure will show that the orifice of the tube is kept face to the wind by the vane, and the water, which in a dead calm stands as shown on the diagram at 0, on the wind increasing is depressed in one leg and elevated in the other, the sum of the departures from 0 indicating the length of water column supported by the wind's force. This is readily converted into lbs. pressure per square foot by simply multiplying the weight of a cubic inch of water by 144, and converting into lbs., we then have 5.2 lbs. for each inch, and of course 0.52 lb. for 0.1 inch, 52lbs. for 10 inches, &c. ; the unit being as stated, anyone can readily deduce any intermediate point for himself.

Fig. 1.



Some modifications of this instrument were suggested by Sir W. Snow Harris in 1858, the leading features being (1) a bent tube of smaller bore used in the hinder part of the U, whereby an enlarged scale was obtained ; (2) an arrangement for closing the hinder part of the tube, so that the reading may be taken off at leisure ; (3) the instrument dismounted from the pivot shown in figure 1, and held by the hand towards the wind, of which the direction was shown by a very small

vane. These modifications contain elements of good. (1) improves its sensitiveness ; (2) is perhaps more promptly and thoroughly effected by the pressure of the observer's finger ; (3) we think possibly good at sea, but decidedly bad for land observers. The plate accompanying Sir Snow Harris's article (in the *Nautical Magazine* for March, 1858), and from which we know some instruments were constructed, appears wrong, as there is no provision for noting the depression in the front half of the U, and the scale is not contracted to compensate for the error. It was a singular oversight in the first instance, and, so far as we are aware, has hitherto escaped detection.

A few years ago Mr. Forbes, of Culloden, suggested a plan for making this instrument record the maximum between any two observations, viz, by putting in the hinder tube a slip of cardboard, previously steeped in a strong solution of sulphate of iron, the water in the tube having been first impregnated with a few drops of prussiate of potash. On the wind elevating the liquid, the cardboard is permanently coloured a deep blue tint, thus marking the maximum force which has occurred. It might be thought that the record of force would be vitiated by capillary action, but Mr. Forbes says that if suitable cardboard is used the difficulty is quite overcome. By cutting a groove in the pedestal marked with the compass points, and placing in it two small indices, then attaching a slight rod to the revolving part of the instrument, these indices may readily be made to record the directions between which the wind has blown, thus giving from this simple apparatus azimuth and force.

The pedestal foot hitherto supplied should be pierced for three or four screws, and the instrument fixed on a pillar four or five feet at least above the ground.

We think it is also expedient that the scale should be altered, each inch being marked as two inches, and so on ; by this means the double reading will be avoided. With these modifications, Lind's anemometer might prove a cheap yet efficient instrument ; cheap, because if there was any demand, they could surely be made for three guineas each.

(To be continued.)

SEVERE HAILSTORM IN INDIA.

"A CORRESPONDENT of the *Madras Athenæum* at Goommanur,* near Bellary, informs us that very bad weather was recently experienced there. On March 28th a terrific hailstorm swept over the place. All the trees in the neighbourhood were stripped of their foliage, heavy branches were torn down, and many trees torn up by the roots. People's clothes were removed from their backs, and a tent was shivered

* Spelt Goomanoor in this article and Goommanur in the second one ; the latter is believed to be correct.

to rags. The hailstones were as large as cocoa nuts and good-sized mangoes. Some four hundred sheep and twenty head of cattle were killed, as were also several human beings, a large number of whom were severely hurt. Thirty hours after the storm, hailstones were picked up in some of the railway cuttings the size of fowls' eggs."—*Homeward Mail*, May 22nd, 1867.

"IN the early part of April the collector of the Kistna district reported to Government that on the evening of March 27, there occurred a storm of wind, accompanied by rain and hail, at the village of Goveravaram, in the Nandigama talook in this district. The hailstones were as big as limes. They continued to fall for about a quarter of an hour, and lay on the ground to the depth of a span. Men and cattle were reported to have been severely bruised by the hailstones, which remained in heaps unmelted till nine o'clock a.m. the next day. The collector of Bellary also reports that on the afternoon and night of March 28 and 29, a very severe hailstorm passed over this district. 'In Adoni to the north of the talook, at Nukkulmittah and other villages, the hail is described as being of the size from cocoa nuts to woodapples, and lying to one foot in depth; in some places destroying the wet and dry crops. In Gooty, at eight p.m. on the 28th, the hail was described as ranging from the size of bullets to limes; some sheep were killed and crops destroyed. The villages indicated are Hunchinbal, Karakamookkala, and Konacondla. In Anantapur talook the size of the hailstones is apparently incredible. I give, however, the local report, that in a field of the village of Bondalavada some of the stones were two-thirds of a cubic yard in size. In the village of Chadula a cubic span, and in other villages of six seers, or three pounds weight; this last was verified by the Tahsildar. Two men, 2,470 sheep, and eight cattle were killed, and some thatched houses were destroyed. In Alur, on March 28 and 29, to south of the talook, at Goommanur and other ten or twelve villages, the hail was described as ranging from the size of cocoa nuts to mangoes, and lying half a yard in depth in some villages, destroying the dry crops, two men were killed, and one was carried away by the flood in a nullah close to Goommanur. Looking from the talook of Hospett on that evening, a vast pile of electric clouds was seen towards the east, similar to those which collect on the western coast before the commencement of the monsoon. I have had no intelligence of hailstorms in the western talooks, or from those furthest south, so that as far as I am at present informed, the storm must have extended over the north, centre, and south-east of the district. When further details are received regarding the loss of crops a report will be made, if any, and what consideration should be shown to the sufferers.' The collector of Cuddapah reports that a severe storm, accompanied by hailstones of extraordinary size, was experienced in different villages of the three talooks, Pulivendala, Royachoty, and Kadiri. In the Pulivendala talook seven individuals received serious wounds and lost their lives. The storm in the other villages swept away the standing crops and stacks, and also killed some sheep."—*Homeward Mail*, June 4th, 1867.

REVIEWS.

A Handy Book of Meteorology, by ALEXANDER BUCHAN, M.A., Secretary of the Scottish Meteorological Society. W. Blackwood and Sons. Small 8vo, 204 pages.

A VERY handy book this, for in its small compass Mr. Buchan has stored more and later information than exists in any volume with which we are acquainted. Yet it is a tantalising book, for occasionally trains of thought are started, pursued with considerable skill, and then dropped suddenly, instead of being pushed to their legitimate conclusions. The old saying that a great book was a great evil we do not accept, and look forward to the day when some one shall publish not a handy book, but a standard work of reference, detailing the steps by which meteorology has been raised to its present position in this and other countries, and pointing out (as Professor Forbes did 30 years ago) the principal subjects requiring investigation. This is not a matter to be lightly taken up, but the condensation of information which repeatedly struck us when perusing this Handy Book, convinced us that, whether or not Mr. Buchan may be inclined to attempt the more serious labour we have indicated, whosoever does undertake it, will do well to keep Mr. Buchan's book and its capital index at his elbow.

We wish authors would be a little more careful in spelling proper names. The last work we noticed was very guilty in this respect, and Mr. Buchan's is just as bad. We do not mind trifling variations, such as Trivandrum for Trevandrum, but who would recognise "Sakoutsh in Siberia," (page 71) as the same as "Yakutsk," (page 76); then we have one of Mr. Buchan's best observers repeatedly at Sandwich instead of Sandwick; and in one line we have Philip's instead of Phillips's, and Nigretti instead of Negretti.

We can hardly give a fairer specimen of the style of the work than by the following quotation on a subject which (though often discussed among observers) has not, we believe, been treated of in any previous publication:—

Mean Temperature deduced from Maximum and Minimum Temperatures.—Of late years, since the invention of self-registering thermometers, the mean temperature has been more commonly deduced from observations of the highest and lowest daily temperatures. How far does the mean of these two represent the mean temperature? To answer this question, I have compared the mean temperature deduced from hourly observations with the mean temperature of the daily extremes at 27 places in different parts of the globe. On an average of six months of the year, the difference between the two does not exceed the third of a degree; the difference for any month seldom exceeds a degree, and the mean annual difference seldom more than half a degree. At Rio Janeiro the difference for any month does not amount to $0^{\circ}3$, whereas at Catherinenburg, in the Ural Mountains, it exceeds this amount in every month but one. In some places the differences are all in excess, in others they are all in defect; in some places an excess occurs in winter and a defect in summer, and in other places *vice versa*. In most places the great difference is in October and November, but in a few places the reverse holds good.

Comparing the Leith and Greenwich observations, we find that the mean annual deviation at Leith is $0^{\circ}2$, at Greenwich $0^{\circ}7$; the lowest monthly deviation at Leith $0^{\circ}1$, and at Greenwich $0^{\circ}2$; and the highest at Leith $0^{\circ}6$, and at Greenwich $1^{\circ}1$. It would appear that these differences are dependent almost entirely on local peculiarities, such as the open or confined situation of the thermometers,

the covering of the ground over which they are placed, the protection from radiation, and the degree of freeness with which the air circulates around them.

At the stations in connection with the Scottish Meteorological Society, the mean of the daily extremes is accepted as the mean temperature, and most meteorologists now adopt the same mean. Others, however, apply to this mean a correction, in order to bring it to what is conceived to be the true mean temperature. This is a practice which, for many reasons, ought to be discouraged. The mean of the daily extremes gives observation alone, whereas the "corrected" means are vitiated by misleading hypotheses. If an observer in the North of England gives the "corrected" mean temperature of August, 1865, as $57^{\circ}3$, what does this mean? If he has adopted the Greenwich correction for that month, the observed mean was $58^{\circ}2$, but if the Leith correction, it was $57^{\circ}4$. If two observers near each other should use the one the Leith correction, and the other the Greenwich, a difference in the climates of the two places would be indicated, which has in reality no existence.

Since penning the above remarks and extract, we have been comparing the numerical values with those given in Mr. Glaisher's Diurnal Range Tables (Taylor and Francis, 1850), the result being that we feel quite puzzled, and must appeal to Mr. Buchan for elucidation. The Greenwich table being a very short one, we quote it verbatim from the 1850 edition :—

"TABLE VIII.

"Showing the corrections to be applied subtractively to the simple arithmetical mean of the readings of the maximum and minimum thermometers, to deduce from them the mean temperature of the air."

January.....	0.2	May.....	1.7	September...	1.3
February ...	0.4	June	1.8	October.....	1.0
March	1.0	July.....	1.9	November ...	0.4
April.....	1.5	August ...	1.7	December ...	0.0"

The mean of these numbers is 1.1 , instead of 0.7 , the lowest is 0.0 instead of 0.2 , the highest 1.9 instead of 1.1 , and August is 1.7 instead of 0.9 . Perhaps Mr. Buchan has taken his values from some later publication; if so, we believe our readers will be as glad as we shall, to be supplied with the correct values. When this is cleared up, we may offer a few remarks on the question, which, in spite of the above-mentioned puzzle, we believe Mr. Buchan has ably investigated.

Meteorological Report and Climatological Tables for 1866, Edited by the Rev. R. F. WHEELER, M.A. 8vo, 26 pages. [Extract from the *Natural History Transactions of Northumberland and Durham*.]

AN able and interesting summary of the principal phenomena of the year, with tables of pressure, temperature, and rain, natural history calendar, &c. Among the notes on the meteor shower of November 13th-14th, 1866, is the following, by the Rev. R. E. Hooppell, M.A., of the Marine School, South Shields :—

"Immediately after the great shower of meteors a remarkable fall in the temperature took place. At Burghfield Grange [Gateshead] the average daily maximum for the seven days immediately preceding, had been $51\frac{1}{2}^{\circ}$, and the average daily minimum 36° . For the seven days immediately succeeding the shower the average daily maximum was only 44° , and the average daily minimum 31° . For the next seven days the average daily maximum and minimum rose again, being respectively 47° and $39\frac{1}{2}^{\circ}$. This remarkable diminution was very extensively observed. The Astronomer Royal's report, from the Cape of Good Hope, shows that it occurred there also, which is the more noticeable, as the season there would be approaching summer, and the temperature would be naturally increasing, not diminishing, from day to day."

Meteorological Observations on the Humidity of the Air of Scarborough, with Chapters on Rain, Rain Gauges, and Rainfall Investigations, and on the Humidity of the Atmosphere in relation to Disease, by CORNELIUS B. FOX, M.D. &c. Simpkin and Co. Small 8vo., vi.-40 pages. Profits arising from its sale to be devoted to the Scarborough Village Hospital.

IN this little book both author and publisher have done their best, and their best is very near perfection. It is a capital little monograph, free from favouritism, that bane of local works on climate. It is just to the beautiful Queen of British Watering Places, but it is no more than just. We only see one way in which it could have been improved, (and perhaps all would not think it an improvement,) namely, by the insertion of a table, giving the monthly and annual fall of rain at Scarborough so far as records have been preserved, instead of giving merely abstracts thereof.

Dr. Fox has done his work well, and we earnestly hope the sale of this cheap little pamphlet will equal its merits, then (though the price is but ninepence!) the Scarborough Village Hospital will reap profits even beyond Dr. Fox's anticipations.

ENTRY OF MINIMUM TEMPERATURES.

To the Editor of the Meteorological Magazine.

SIR,—It will be obvious to anyone who examines the returns published in your Magazine that considerable diversity of practice exists among observers in entering the minimum temperature. For example, in the returns for April, at several places the minimum is recorded as occurring on the 1st, *i.e.*, the night March 31st–April 1st; at other places not very remote it is set down to the 11th, *i.e.*, the night April 11th–12th (the nights April 1st–2nd and 10th–11th were neither of them frosty).

I have been in the practice of entering the minimum to the preceding day, considering that by the night of 11th April would be popularly understood the night following that day. The astronomical reckoning from noon to noon is also in favour of this practice, but uniformity is so desirable that the minority should give way to the majority as soon as it can be ascertained which plan is generally adopted. Can you not obtain a general report, and settle this question?—Yours respectfully,

J. ALEXANDER.

Sudbury, May 31st, 1867.

[So far as we are at present aware, the practice of the Meteorological Society and the Scottish Meteorological Society is identical. The instructions of the former are :

“The maximum temperature usually takes place during the early afternoon hours, and whether the reading be taken after this time on the same day, or early on the next day, it must be entered opposite to the day to which it belongs—that is, on the same day as read, if taken late on the one day, or on the preceding when taken early on the morning of the following day. The minimum temperature usually takes place early in the morning, and the minimum read in the morning is generally the minimum for that day, and is to be so entered.”

The Scottish Meteorological Society direct that—

“The self-registering thermometers are to be read at 9 p.m. only, as indicating the greatest and least degrees of temperature in the 24 hours preceding. It is not a matter of indifference when the self-registering thermometers are read, since, in winter at least, the extremes may occur at any hour, and it is necessary to refer their occurrence to their proper meteorological day. In the Society's schedules the indications registered on the 3rd are those of a series of phenomena commencing at 9 p.m. on 2nd, and extending till 9 p.m. on 3rd.”

Thus both are in strict accord, and we think the sooner all observers unite in complying with these instructions the better.]—ED.

RAINFALL AT CARDIFF.

SIR,—Just before your notice of Col. Capper's book on Meteorology, I had perused that work, and copied out the rainfall table to send to you. That table is not to be relied on as an accurate account of the rainfall in this district, the true quantity being very nearly double the colonel's measurement. There is no reason to suppose that the rainfall here has diminished, so I can only attribute the deficiency to imperfection in the colonel's rain gauge. This seems to me to raise a doubt as to the correctness of old records of rainfall, in the absence of any information stating the kind of gauge employed in taking the observations. This is especially the case when the register differs very widely from more modern measurements.—Yours faithfully,

FRANKLEN G. EVANS.

Tynant, Pentyrech, June 3rd, 1867.

[In reply to this note, we will first explain that as a rule we do not use old observations for determining the mean rainfall of the locality at which they were taken. We collect them with every care, test their accuracy as far as possible, and preserve them most securely, because they are our best and only guide to what may be termed secular rainfall variations—that is to say, the relation of each year to the mean of a series of years. In this respect it is obvious that if a gauge was so absurdly incorrect as always to indicate double the fall which actually occurred, it would not cause the least error in the ratio of fall in different years.

With reference to the case in point, we prefaced the insertion of the table by the following words, (*Meteorological Magazine*, Vol. II., p. 45):—"Of the size or position of the gauge nothing is said; from the amount we infer it must have been on a roof or wall." The letter of so careful an observer as Mr. Evans has induced us to examine the matter closely, with the following results:—

The rainfall in the years 1800-1807, we find from a table printed (but not yet published) in the forthcoming British Association Report, was 12 per cent. below the mean of the last 50 years. The observed amount being 23·76, the addition of this 12 per cent. only raises it to 26·61, which is certainly very different from the true fall, which is about 40 inches. A deficiency of one-third is therefore apparent, being the same deficiency as that found on the roof of Mr. Washington Moon's house in the Finchley-road, (*British Rainfall*, 1866, p. 27), thus supporting our suggestion that the gauge may have been on a roof. Unfortunately we have at present no records from the south-west of England or from Wales complete for these 8 years; we have therefore been compelled to fall back on distant stations for the formation of the following table:—

Rainfall in England, 1800 to 1807.

STATIONS.	1800	1801	1802	1803	1804	1805	1806	1807	Mean of 8 yrs.
	in.	in.	in.	in.	in.	in.	in.	in.	in.
Chatsworth	27·73	28·35	23·34	24·27	27·90	22·23	30·08	26·37	26·28
Ferriby, Hull ...	29·50	26·25	23·92	26·25	26·50	24·50	30·87	27·00	26·85
Kendal	48·25	50·50	51·73	40·50	47·25	42·75	53·89	53·00	48·48
Lancaster	35·93	44·63	47·46	34·75	35·62	33·52	40·72	37·01	33·71
Manchester	32·34	35·05	35·74	27·47	29·31	27·54	33·49	35·50	32·06
Nottingham	27·00	26·50	21·00	17·00	23·50	22·12	25·56	23·33	23·25
Mean, 6 Stations	33·46	35·21	33·87	28·37	31·68	28·78	35·77	33·70	32·61
Cardiff	26·82	24·10	22·77	20·59	27·01	20·28	27·86	20·68	23·76
Ratio { 6 Stations	103	108	104	87	97	88	110	103	100
Cardiff ...	113	101	96	87	114	85	117	87	100

Considering the distance of Cardiff from even the nearest of these stations, we think the fluctuations as favourable to Colonel Capper's accuracy as could be expected.]—ED.

MEASUREMENT OF SNOW.

To the Editor of the Meteorological Magazine.

Sir,—The following method for obtaining the equivalent volume of rain and snow might be advantageously adopted. Fill a tumbler with loose snow, which would be best done by placing the tumbler where a snow-drift is likely to occur, weigh the tumbler thus filled. Now fill with water and weigh again; subtract the weight of the tumbler in each case. Divide the weight of snow by the weight of water. A modulus will thus be obtained, by which if any given volume of snow is multiplied its equivalent in water will be found.—I am, yours obediently,
J. S. W.

[J. S. W. is quite right in recommending us to weigh the snow instead of evaporating 10 per cent. in our attempts to melt it.].—Ed.

METEOROLOGICAL PERIODS.

To the Editor of the Meteorological Magazine.

SIR,—I was faithless about the 29 years return of the same seasons until I read to the end of the statement of your correspondent, when it appears wonderful how similar *many* of the years are, and *dissimilar some*. But your correspondent does not give us 1838 to guide us as to this year of 1867; if there is any truth in it, there would be some use in being forewarned. I see, however, what 1809 was, which is 58 years ago, which was a fickle summer but a very hot May, and we may say there is some similarity thus far, for one week in May was very hot, thermometer 85° on the Monday.—I remain, Sir, yours truly,
Cambridge, May 22nd, 1867.

J. NUTTER.

A SHOWER OF HAZEL NUTS!

To the Editor of the Meteorological Magazine.

SIR,—I enclose you two extracts from one of our Dublin papers relative to some berries, which are reported to have fallen in large quantities in some parts of Dublin on the night of Thursday, 9th May. I have been given two of these berries; they are in the form of a very small orange, about half an inch in diameter, black in colour, and, when cut across, seem as if made of some hard dark brown wood. They also possess a slight aromatic odour.

Various speculations have been given forth as to their origin, but none of them seem to be worth much. If you think the extracts herein, worthy of a place in your Magazine you can insert them.—Yours very truly,
ARTHUR PIM.

Monkstown, Dublin, June 1st, 1867.

THE SHOWER OF BERRIES.

To the Editor of the Daily Express.

SIR,—I have been daily expecting to see some notice of the strange phenomenon which took place during the tremendous rain-fall of Thursday night. None having appeared in any of the journals, I hope, through your columns, the public may learn to what cause we are to attribute the shower of aromatic smelling berries which fell over Dublin (and, possibly, other parts) on Thursday night.

Both on the north and south sides of the river these berries fell in great quantities and with great force, some being larger than the ordinary Spanish nut.

Numbers of these strange visitors were picked up in Capel-street, in Dame-street, and Bishop-street, and I am informed that so violent was the force with which they descended that even the police, protected by unusually strong head covering, were obliged to seek shelter from the aerial fusilade!—Yours truly,

T.C.D., May 13th, 1867.

RUSTICUS EXPECTANS.

INQUIRER, who has sent us some "small balls," which he says "fell in large quantities on Thursday night," locality not specified, is informed that they are simply hazel nuts, preserved in a bog for centuries. How they came to descend on him we cannot say.

MAY, 1867.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.					Days on which Fall in 24 hours. or more fell.	TEMPERATURE.				No. of nights below 32°.
		Total Fall.	Difference from average 1860-5	Greatest Fall in 24 hours.				Max.		Min.		
				Dpth.	Date.	Deg.		Date.	Deg.	Date.		
											inches.		in.
I.	Camden Town	2.45	+ .05	1.03	20	9	84	6	31.8	23	1	
II.	Staplehurst (Linton Park) ...	2.35	— .11	.59	11	12	85	7	29	23†	5	
	Selborne (The Wakes).....	1.66	— .81	.40	25	12	77	6	25	4	6	
III.	Hitchen	3.03	+ .55	1.13	10	11	75	6, 8	30	22§	3	
"	Banbury	3.02	+ .80	.83	10	10	79	8	29.7	23	4	
"	Wisbech.....	3.51	—	1.62	10	9	84	6	32.3	23	0	
IV.	Bury St. Edmunds (Culford) ..	2.65	+ .49	1.14	12	10	80	6	27	24	3	
V.	Calne	1.80	—	.49	20	9	79.5	8	28.8	25	3	
ENGLAND.	Plymouth (Goodamoor) .....	...	...	...	...	...	...	...	...	...	...
	Barnstaple	2.63	+ .20	.35	11	13	...	...	...	...	...
	Taunton (Fulland's School) ..	2.88	+ .83	.65	13	14	89.5	30	33	17	0	
	Shrewsbury (Highfield)	2.73	+ .13	.72	12	11	...	...	...	...	...
	Tenbury (Orleton)	2.25	— .64	.52	25	13	78.7	8	31.4	25	2	
	Leicester (Wigston)	2.02	— .46	1.02	11	10	85	8	27	23	3	
	West Retford .....	...	...	...	...	...	...	...	...	...	...
	Derby.....	1.73	— .43	.56	10	11	78	8	33	17	1	
	Manchester	1.95	— .71	.38	27	9	76	5, 6	32	23||	0	
	IX.	York	1.78	— .17	.43	26	17	71	9, 30	33	23	0
WALES.	Skipton (Arncliffe)	2.42	— .93	.40	11	12	69	30	32	23	0	
	North Shields	2.32	— .32	.84	11	15	...	...	...	...	...
	Borrowdale (Seathwaite)	5.25	— 4.29	.94	18*	14	...	...	...	...	...
	Abercarn	4.70	—	.93	13	13	72	9	36	23¶	0	
	Haverfordwest	4.15	+ 1.43	.84	21	14	74	8	31.9	22	1	
	Rhayader (Cefnfaes) .....	...	...	...	...	...	...	...	...	...	...
	Llanberis (R. Victoria Hotel) ..	2.44	—	.91	25	11	...	...	...	...	...
	Dunfriess	2.85	+ .46	.43	11	15	73	8	31.5	25	1	
	Hawick (Silverbut Hall)	2.46	—	.60	26	17	...	...	...	...	...
	XIV.	Ayr (Auchendrane House) ...	1.51	— 1.60	.42	11	13	74	8, 31	28	22	2
SCOTLAND.	Otter House	1.67	— 2.07	.31	10	12	66	8, 30	32	22	1	
	Leven (Nookton)	4.47	+ 2.47	1.08	26	15	64	6	33.4	14	0	
	Stirling (Deanston)	3.89	+ 1.24	.89	11	17	69	30	30.3	23	3	
	Logierait	2.82	—	.63	11	16	...	...	...	...	...
	Ballater	2.54	—	.10	11	18	66.5	6	29	26	3	
	Aberdeen	2.68	—	1.15	11	18	67.3	7	32.7	14	0	
	Inverness (Culloden)	1.59	—	.40	17	12	64.6	6	33.6	26	0	
	Fort William	2.01	—	.40	31	16	67	8	32	23	...	
	Portree	3.08	— 2.57	.65	16	13	76.5	27	31.8	23	1	
	Loch Broom	1.91	—	.57	16	14	...	...	...	...	...
IRELAND.	Helmsdale	2.18	—	.54	11	17	...	...	...	...	...
	Sandwick	1.11	— 1.15	.21	4	12	...	...	...	...	...
	Cork	5.37	—	1.45	25	20	...	...	...	...	...
	Waterford	5.19	+ 2.94	1.55	26	21	67	29	39	16**	0	
	Killaloe	3.45	+ .27	.61	10	15	70	19	29.5	23	1	
	Portarlington	3.56	+ .37	.76	11	18	69	9	31	22	1	
	Monkstown	3.07	+ 1.17	.75	10	14	68.5	3, 12	32.5	23	0	
	Galway	4.67	—	.99	12	19	73	23	40	12††	0	
	Bunninadden (Doo Castle) ...	4.62	—	.70	10	18	66	30	28	23	2	
	Bawnboy (Owendoon)	4.94	—	.75	10	20	...	...	...	...	...
	Waringstown	2.93	—	.59	16	13	73	30	28	22	2	
	Strabane (Leckpatrick)	3.12	—	.49	10	14	68	8†	31	23	1	

* And 27th. † And 9th & 30th. ‡ And 24th. § And 23rd & 24th. || And 24th. ¶ And 24th.

** And 23rd. †† And 14th.

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

METEOROLOGICAL NOTES ON THE MONTH.

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.

LINTON PARK.—T on 10th, 11th, and 29th; frost on 17th, 22nd, 23rd, 24th, and 25th. Altogether a very remarkable month; very hot from 4th to 11th, while from the 20th to 26th it was very cold; S falling in sufficient quantities on the 23rd to cover the ground, and the frosts very destructive to vegetation; the last few days more mild.

SELBORNE.—Rapid advance in vegetation during the first part of the month, but the effects of the frosts of the 23rd to 25th, inclusive, were most disastrous, potatoes, french beans, and dahlias destroyed, young leaves of ash, walnut, and oak blackened as if burnt, gooseberries and currants as if parboiled; the cold for those four days has not been equalled in May within my memory. T with H on 10th.

HITCHEN.—On the 10th a storm almost equal to the famous one of July 7th, 1865.

BANBURY.—L on 9th, and violent TS on 10th; balls of S and H on 22nd. Lilac in flower on 4th, hawthorn on 6th.

WISBECH.—Heavy TS with very vivid L on 10th; ground covered with H on 22nd. Walnut in leaf on 3rd, oak on 6th, lilac in bloom on 3rd, laburnum on 8th, honeysuckle 9th, mountain ash 13th, syringa on 27th.

CULFORD.—The weather during the month has been of a most extraordinary character; up to the 12th day the temp. was almost tropical, when a most remarkable change took place. Sharp frost on the night of the 16th, but most severe from the 21st to the 25th; great injury to crops; shoots of oak, ash, walnuts, &c. blackened, garden vegetables injured, some destroyed, and tender flowers killed.

CALNE.—Swifts arrived on 6th; downs white with S on 22nd.

TAUNTON.—L at 10.30 p.m. on 9th, and heavy T at noon on 10th. Hot at the beginning and end of the month, but so cold in the middle as to retard vegetation for about a fortnight.

SHREWSBURY.—H storms on 22nd.

WIGSTON.—This month will be memorable for the very unusual range of temp., being 58°; the heat at the end of the month more than compensated for the coldness previous to the 25th, the mean of the month being above the average for May. Vegetation forward except corn; slight S showers on 22nd and 23rd.

DERBY.—May opened at a summer heat, then relapsed into winter, the ground frosts on several nights having injured the young potatoes and kidney beans, though at 5 feet from the ground the ther. never registered less than 33°, and that only on one night.

ARNcliffe.—S on 22nd.

NORTH SHIELDS.—TSS on 6th, 10th, and 28th; S on 15th, 23rd, and 24th; H on 13th, 14th, 21st, and 22nd.

SEATHWAITE.—Dry month, no day on which 1.00 in. of R fell.

WALES.

ABERCAEN.—A cold ungenial month, with a prevalence of N. and E. winds till the 26th; a blighting hoar frost on the 24th. Alternations of heat and cold very sudden.

HAVERFORDWEST.—First week spring-like, and some days quite summerish, after which it was wet, cold, and stormy. Such a May cannot be remembered.

SCOTLAND.

DUMFRIES.—First ten days warm with much T and R; from 12th to 26th cold northerly winds with occasional frosts; from 26th to close, warm during the days with copious R at night. Extraordinary TSS on 6th and 8th; heavy H on 8th; S on 22nd and 26th. Vegetation checked for a fortnight in the middle of the month, but at the close great progress, with abundance of sunshine and showers; hawthorn in blossom on 19th; early potatoes injured by the frosts on 22nd & 25th.

SILVERBUT HALL, HAWICK.—T on 6th 8th and 22nd; H and S on 13th, 21st, 22nd, 23rd, and 24th; hard frost on 24th. The swallows have nearly all disappeared from this district; landrail heard on 17th.

AUCHENDRANE HOUSE.—This has been a month of very small rainfall, strong

evaporation, and most unseasonable extremes of temp. By the exposed black bulb on short grass the highest *day* temps. were on the 2nd, 14th, 22nd, 23rd, 24th and 25th, being 99°, 95°, 96°, 102°, 92°, 98° respectively, and the lowest night temps. were 33°, 30°, 26°, 24°, 32°, and 28° respectively. The destruction to early vegetation has been excessive, and even the trees have suffered, particularly in low situations; no S in this district.

OTTER HOUSE.—E much below the average. Rather a cold and ungenial month; easterly winds prevailing, and the thermometer ranging from 32° to 66°; at the end of month beautiful summer weather, and the crops looking well.

NOOKTON.—Cold and ungenial month.

DEANSTON.—Except on four days during the month, easterly winds have prevailed; these were very cold and occasionally very strong. All vegetation very backward; at the end of the month the hawthorn blossom not out, and lilac and laburnam only coming out.

LOGIERAIT.—A few fine days at commencement; cold E. winds from 12th to 27th, which greatly retarded vegetation; closing week more genial. Corncrake heard on 12th.

BALLATER.—The weather of the past month has been stormy and disagreeable; prevailing wind easterly, checking vegetation; on the 12th, 14th, and 22nd, the hills were white with S; grass and oats continue to look well in this quarter, but things generally are three weeks later than usual; H and S on 22nd.

ABERDEEN.—Ground white with S on 22nd; a month of ungenial weather, with little wind; 22 days from N.E., E., and S.E., and much fog. Bar. rather above average. Mean temp. nearly 3° below the mean of last 10 years; rainfall above the average of same period.

FORT WILLIAM.—Greater part of the month cold and ungenial, but less so probably than in England; there was S on the hills on the 16th, but none on the low ground; the total fall of E was about equal to the corresponding month last year, and less than half that of May, 1865.

PORTREE.—This month very cold, more than the usual amount of N.E. wind; frost under the average for this month. Grass is making wonderful progress; cattle much improved in condition. Solar halo on the 24th. No gales during the month.

LOCHBROOM.—This month may be considered dry, but very cold for May. Vegetation of every kind is remarkably late, and the rest of the season must be unusually favourable, or the harvest will be both late and scanty; the last two days give promise of better things.

SANDWICK.—Aurora on 1st and 2nd; cold E. winds on 22 days; mean temp. the lowest since 1855.

I R E L A N D.

MONKSTOWN.—A very variable month, commencing warm, very cold during part of the latter half, and closing warm and seasonable. The crops and vegetation have been considerably retarded by the cold, but no serious damage to them has taken place, the cold not having been nearly so severe as in England. On 29th the dry bulb stood at 64°·7, and the wet at 57°·5, showing a difference of 7°·2.

DOO CASTLE.—Large breadth of oats sown here at the beginning of the month, and, with regard to the state of the soil for the reception of the grain, without any visible advantage to compensate for the long delay. A wet month, except from 18th to 25th, when we had cold, piercing E. winds, and dark sunless days, which, as the farmers about here say, put everything back again into the ground. All descriptions of farming operations behind hand; frost on 22nd and 23rd which injured potatoe-tops, particularly in moory and boggy land; more than 100 sheep have died in the adjoining county from the effects of cold after being shorn.

OWENDOON.—S on mountains on 12th; T S on 27th; potatoes injured on 22nd.

WARINGSTOWN.—The early part of the month was cold, with harsh winds and bright sun; the heavy rainfall from the 25th to the 29th softened the air, and the rest of the month was genial.

LECKPATRICK.—Fine till the 9th, then a succession of R and cold easterly winds retarded all agricultural progress; only one frosty night, but cherries, gooseberries and pears injured by the cold, and the crop will be deficient. Potatoe planting very late; turnips sown last week.