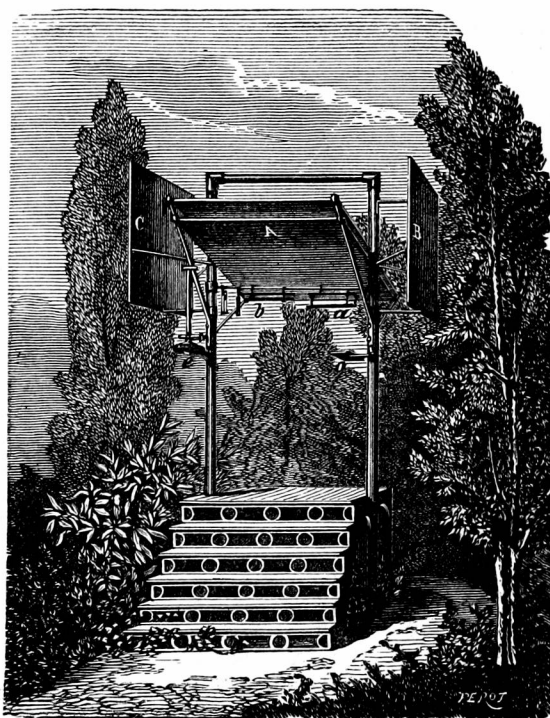


ABRI DES THERMOMÈTRES DE MONTSOURIS,



MONTSOURIS THERMOMETER STAND.

S Y M O N S'S
MONTHLY
METEOROLOGICAL MAGAZINE.

CXLIX.]

JUNE, 1878.

PRICE FOURPENCE
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METEOROLOGY AT THE PARIS EXHIBITION.

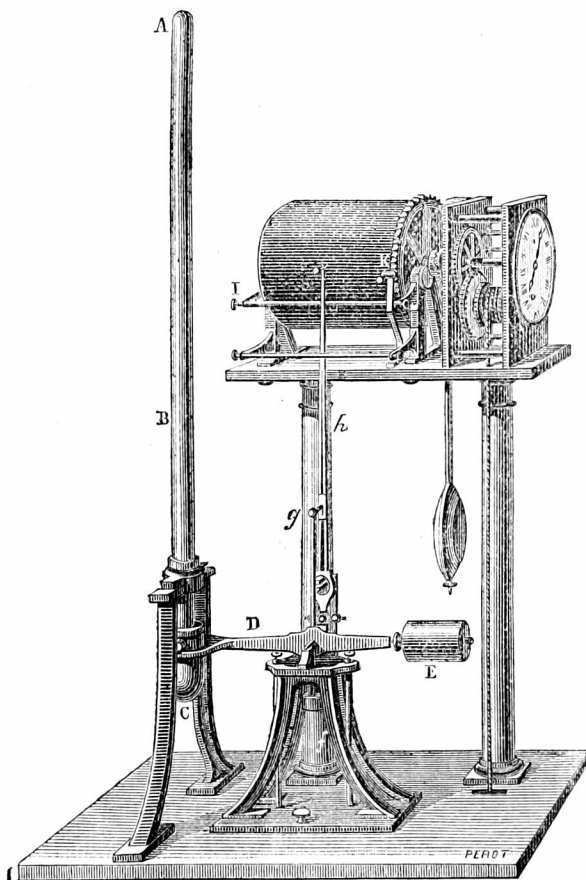
(Continued from page 52.)

THE temporary Montsouris Observatory contains several instruments besides those already mentioned. There are, for instance, a self-recording electrometer, a set of ordinary thermometers, and a **Salleron's Recording Barometer**. As we do not think that any balance barometer has yet been described in this magazine, we will give a brief notice of the one exhibited. It may be well to go back to the very simplest statements, in order to prevent any possibility of this really very simple instrument being misunderstood. Suppose that an ordinary barometer were hung on a balance, it is evident that it would always weigh the same, no matter what the barometric reading, as it would be of no consequence whether the mercury were in the cistern or the tube. Sometimes the cistern is fixed and the tube hung on a balance; according to Everett* this plan was adopted by Samuel Morland in 1680, but we should be glad to know where the description is to be found. In M. Salleron's instrument the tube is fixed and the cistern moveable, and this being premised, the engraving on page 66 will render the general features very easily understood. A B is the fixed barometer tube of which the internal diameter is nearly $1\frac{1}{4}$ inches; C is the cistern attached to the arm D of the balance, and counterpoised by the weight E; from the centre of the balance a long indicator passes upwards, and has at its extremity a needle point which scratches the smoke-blackened cylinder K, nearer to I when the barometer falls, and nearer to K when it rises. The cylinder K of course revolves by clock work in the usual manner.

We ought not to pass over without mention the **Aeroscope**, a small vane carrying a curved glass tube through which atmospheric air is constantly passing, so that the dust and animal and vegetable matter floating in it may be collected for analysis. We are not aware that such experiments are being tried anywhere except at Paris and Glasgow. Although we certainly cannot prevent the existence of dust

* Deschanel's "Natural Philosophy," p. 158.

in the atmosphere, it is of interest to know its characteristics, and how much of the sad total of human disease is traceable to it.



Meteorology and Agriculture.—It is satisfactory to think that our Meteorological Council have begun to do something towards providing materials for comparing meteorological data with agricultural results ; far too little has hitherto been done in that direction, and even of that little, other countries have left ours behind. We talk of scientific farming, but we saw no meteorological statistics in the English agricultural department, while Denmark shows a very interesting set of seasonal charts of the distribution of temperature and rain in connection with agricultural products. No one can entertain a shadow of doubt that meteorology could largely benefit agriculture ; why is there a chasm between them ?

Ponti, of Venice, sends the most unusual **Telescope** we have ever seen. It is about 5 ft. long, and consists of two telescopes close together, something like an enormous race glass, but the tubes are

rectangular, and the object glasses being large, the two tubes join and form one rectangular figure, somewhat thus—



There is separate rackwork for focussing each eye piece, an arrangement which it seems to us might, with advantage, be applied to the best quality of race glasses, for there are few persons whose two eyes are of precisely equal focus. The telescope is brilliantly lacquered, and mounted upon a handsomely carved stand, with the names (and busts if we are not mistaken) of Galileo, Dollond and Schneider. Altogether the instrument is quaint in the extreme; we can scarcely imagine anything which would harmonize better with the present antique style of domestic furniture, and we should think that for ordinary purposes it must be as agreeable to use as it is handsome in appearance.

As to meteorological apparatus in general we did not see any, except from Italy, Russia, England, Switzerland, and France, and our estimates of the value of the exhibits is given by the order in which we have named the countries; those from Switzerland and France being far ahead of all the rest. The exhibits from Italy and Russia do not call for any notice, and England has but two or three exhibits of meteorological apparatus. Fortunately **Negretti and Zambra** have sent a collection, which includes most of the patterns employed in this country, and fully maintains the reputation of the firm. Their extremely clever turn-over thermometer appears in several forms, both as adapted for observations of sea temperature at any depth and also attached to clocks for giving hygrometric observations at any hour of day or night without the attendance of the observer. Of the extreme excellence of this **Self-recording Hygrometer** we cannot speak too highly. We may also direct attention to a large bore **Standard barometer**, the workmanship of which is superior to that of any other in the building.

Cetti, of Brooke-street, Holborn, is better known for high class work in glass blowing than for strictly meteorological apparatus. The gems of his case are some glass tubes with threads turned on their ends and sockets running on them as truly and as perfectly air tight as possible; his glass taps and stopcocks are also extremely good. He exhibits a very large Six's thermometer, which is almost equally remarkable for two features; first, for the difficulty of making it, and secondly, for that of having conveyed it to Paris without disarrangement; of course it has no claim to be considered as a strictly scientific instrument. It is quite otherwise with some of Mr. Cetti's **thermometers** which are extremely good. One or two new methods may be mentioned,

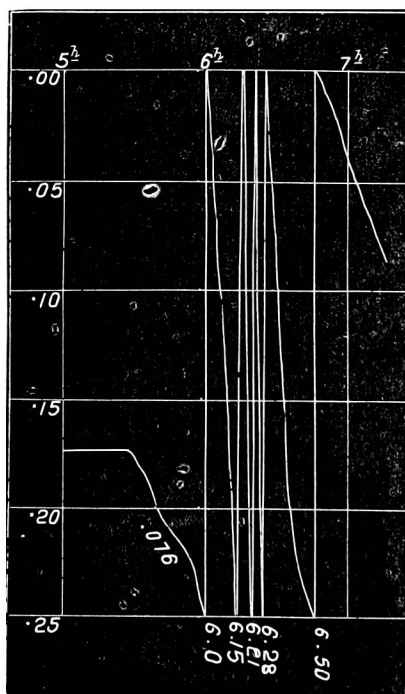
Double Scale Thermometers, *i.e.*, Centigrade and Fahrenheit divided on the tubes; this is done by making the tubes triangular, and putting one scale on each of the two front faces. His **Solar Radiation Thermometers** are held in their places inside their jackets by glass alone, so that the errors produced by using cork, india-rubber, &c., are entirely avoided. There is also a very handsome Wheel Barometer.

We saw the large **Recording Aneroid** which Mr. Pillischer exhibited at the Loan Collection at South Kensington, in the hall of the British Commission; whether or not it has been moved into the main building we are not aware. The same maker exhibits an equatorial, of which, without trial, it is impossible to give a fair verdict, but appearances are much in its favour, far more so than they are to one shown by Dallmeyer, which is quite ablaze with lacquer, and the appearance of which after twelve months' work will be far inferior to its less gaudy companion.

(To be continued).

HEAVY RAINFALLS, MAY 6TH-9TH.

THERE were several heavy falls of rain between May 6th and 9th, but the heaviest of which we yet have particulars was that at Greenwich, in the afternoon of the 6th, and we are therefore glad to be able to give a reproduction of the trace of the self-recording rain gauge on the roof of the Royal Observatory during the heaviest part of the fall.



It will be seen that the fall was—

Up to 6. 0 p.m.	...	0·076							
From 6. 0 to 6.15	„	0·250	being	·250	in 15 min.,	or 1·000	per hour.		
„ 6.15 to 6.21	„	0·250	„	·250	„ 6	„	3·000	„	
„ 6.21 to 6.28	„	0·250	„	·250	„ 7	„	2·143	„	
„ 6.28 to 6.50	„	0·250	„	·250	„ 22	„	·682	„	
„ 6.50 to 9.30 a.m., 7th		0·524							
TOTAL		...	1·600						

At *Tenterden* the rain began at 4.45, and at 5 p.m. ·17 in. had fallen, by 5.25 ·34 in., by 5.35 ·47 in., and by 5.45, or in one hour, ·59 in. fell. In the next hour the fall was ·18 in., and by 9 p.m. the total was ·97 in., and by 9 a.m. on 8th it was 1·30 in.

At *Camden Square* the heaviest fall was between 5.10 and 5.31 p.m. on the 6th, in which 21 minutes 0·65 in. fell; from 5.31 to 5.46 there was a further fall of ·18 in., making ·83 in. in 36 minutes, and subsequent steady rain brought the total up to 9 a.m. on 7th to 1·71 in.

At *Branch Hill Lodge, Hampstead Heath*, 1·30 in. fell between 5 and 6 p.m. on 6th, and 0·56 afterwards, making the total to 9 a.m. on the 7th, 1·86 in.

At *Uppingham*, the fall for the 6th was only 0·30 in., but steady rain began about 5 p.m. on 7th, and 1·35 in. had fallen by 9 a.m. on 8th, thence to 5 p.m. on 8th 0·63 in. more fell, making for Uppingham the unusual total of 1·98 in. in 24 hours.

At *Cambridge* there fell between 3 p.m. on 7th, and 9 a.m. on 8th, 1·10 in., and thence until 4 p.m. on 8th, 0·53 in.; total in 25 hours, 1·63 in.

THUNDERSTORM WITH HEAVY RAINFALL AT WORTHING, JUNE 8TH, 1878.

To the Editor of the Meteorological Magazine.

SIR,—The wind which had been W. and S.W. for some days previous “backed” suddenly during the forenoon of the 7th to S.E., and the barometer began to fall. The morning of the 8th broke fine with a fresh breeze from E.S.E., a sharp fall of the barometer took place during the night (0·223 inch), and the fall continued throughout the day, though at not so sharp a rate. Heavy masses of storm cloud gathered about after 1 p.m., and shortly after 3 p.m., large drops of rain fell; by 3.20 p.m. the rain was coming down both steadily and freely. The thunderstorm which had been threatening all the morning now began in earnest—the lightning being extremely vivid, and the thunder close, and apparently quite overhead—the rain descended in torrents, quite warm, and truly tropical in its nature.

Some hail fell about 3.30 p.m.; at 3.42 p.m. a most vivid flash of lightning occurred, followed instantaneously by a very terrific crash of thunder. There is no doubt, from what I have gathered since Saturday, that we were right in the centre of the path or track of the storm, as 7 miles westward and 10 miles eastward neither the storm itself nor the rainfall were of such a severe character. When the storm

was at its worst, the streets ran down in rivulets, and being pretty nearly on a dead level, the result was anything but satisfactory, considering the tide was high upon the beach, and the sewers were completely waterlogged. Shortly after 4.0 p.m. the storm gradually died away, and by 4.20 p.m. all rain had ceased. On returning home, I took the contents of the rain gauges, and found that both the 5-inch and the 8-inch measured exactly 1.00 inch, which had fallen in the course of 1 hour and 10 minutes. In all my experience since 1867, I do not remember such a heavy downpour in so short a space of time. Annexed are the various readings of

BAROMETER. Reduced to Sea Level.			THERMOMETER.						RAIN.
			Dry.	Wet.	Max.	Min.	Solar Max.	Grass Min.	
June 7	9 a.m.	30.184	59.8	56.7	...	...	...	...	...
" "	9 p.m.	.018	58.0	56.2	64.0	50.2	112.0	40.5	...
" 8	9 a.m.	29.795	61.2	57.7	...	...	...	...	1.00
" "	9 p.m.	.674	59.0	58.0	64.5	51.4	122.0	50.3	...
" 9	9 a.m.	.670	59.2	57.0	...	...	...	...	...
" "	9 p.m.	.626	57.2	55.0	63.5	55.5	123.0	51.1	...

— I am, Sir, yours obediently,

WM. J. HARRIS, F.M.S.

THE FRENCH METEOROLOGICAL SERVICE.

WE learn that M. Mascart has been appointed head of the meteorological bureau. He is professor in the College de France, his special subjects being light and electricity. He is author of a work in two volumes, on static electricity.

Last week we gave a brief sketch of the new organization of the French meteorological service by the government, and this week we are able to publish a translation of the decree, from which it will be seen how much alive the French government is to the national importance of a complete meteorological service. How Article 2, referring to "Titular Meteorologists," "Adjoint Meteorologists," and "Assistant Meteorologists," must surprise our "Meteorological" Council! In France they actually insist on meteorologists to do meteorological work and to advise upon meteorological matters.

Article 1. The meteorological division of the Paris Observatory forms a distinct service, which takes the title of "Bureau Central Météorologique." This service comprises the study of the movements of the atmosphere, meteorological advertisements to the ports and to agriculture, the organization of the meteorological observations, and of the regional or departmental commissions, the publication of their works, and the whole of the researches on meteorology or on climatology.

2. The meteorological service of France comprises titular meteorologists, *adjoint* meteorologists, and assistant meteorologists. The salary of the titular meteorologists varies from 3,000 to 10,000 francs. The *adjoint* meteorologists are divided into three classes, whose salaries vary from 2,500 to 5,000 francs. The assistant meteorologists are divided into two classes, whose salaries vary from 1,500 to 2,000 francs. This staff is distributed among the central bureau and the regional or departmental observatories, in proportion to the needs of these establishments.

3. The scientific staff of the central bureau comprises a titular meteorologist acting as director, two titular meteorologists placed under him, *adjoint* meteorologists, and assistant meteorologists. One of the *adjoint* or assistant meteorologists acts as secretary of the central bureau.

4. The director is charged with the general service of the establishment, the correspondence, the presentation to the minister of the proposed annual budget, the meteorological service, and a detailed account of the yearly expenses. He ought to secure the co-ordination and execution of the works which demand the concurrence of the different services placed under his orders, and see to the regularity of the publications. No order may be given without his authorisation.

5. The scientific works are divided as follows :—(1) Service of advertisements to the ports and to agriculture. (2) Service of the general movements of the atmosphere. (3) Service of climatology and of inspections. Each of the chiefs of the service remits monthly to the director a summary report on the progress of the works, and brings directly before the committee, instituted in the following article, the scientific questions of the service.

6. The heads of the service meet each month, on a fixed day, under the presidency of the director. This committee may hold extraordinary meetings at the instance of the director.

7. The titular meteorologists and the director are nominated by decree, on the proposition of the minister, and after the advice of the council, to be spoken of afterwards. The *adjoint* and assistant meteorologists are appointed by orders after advice of the same council.

8. The heads of the regional meteorological observatories are placed under the authority of the director of the central bureau. Each of these officials addresses to the central bureau, under cover of the minister, the observations and works of his establishment. He proposes to the council, through the director of the central bureau, the advancement of the meteorologists under his orders.

9. The meteorological observatories and stations of every order will be visited annually by the meteorologist of the central bureau charged with the service of climatology and inspections. They may also be visited by the director of the bureau or by a member of the council appointed for that purpose. In cases where the departments or towns contribute to the expenses of a meteorological observatory, the inspection will take place in company with the delegate of the general or municipal council interested.

10. There is established beside the central meteorological bureau, a council composed of (1) A representative of each of the Ministries of Agriculture and Commerce, of Public Works, of War, Marine, Foreign and Home Affairs and of the Administration of Telegraph Lines ; (2) Two delegates from the Ministry of Public Instruction ; (3) Two members of the Academy of Sciences ; (4) The director of the central bureau. The heads of the special service of the bureau are admitted to the council, with a consultative voice for questions which interest them. The members of the council are appointed for three years, by decree, on the proposal of the Ministry of Public Instruction.

11. The council of the central bureau will meet once every quarter on a fixed day. It may hold extraordinary meetings at the instance of the minister. The council gives its advice in the budget proposed by the director, on the construction of buildings or instruments intended for regional meteorological observations, on the collective investigations carried on in the various establishments, on the nominations and promotions of the officials, &c.

12. The president, vice-president, and the secretary of the council are appointed annually by the minister on the proposal of the council.

13. The council holds a general meeting yearly at which may be present the heads of the central bureau and of the regional observatories, the delegates of the regional and departmental commissions, and three delegates of the French Meteorological Society.

A regulation deliberated in council and approved by the minister will determine the mode and number of the delegations.

This meeting will hear the report of the president and council on the work of the year, and, if there are any, the reports and memoirs of the heads of the observatories that receive subventions, and those of the delegates of the regional or departmental commissions. It will discuss the views submitted to it, and transmit them to the minister. The report of the president will be printed.—*Nature*, May 30th.

GAINFORD RAINFALL.

WE need scarcely say more than that, following the precedent set some months since, Mr. Atkinson, of Gainford, has kindly supplied us with copies of a summary of his observations during the past ten years, and that a copy ought to be found enclosed with every copy of the present number. It may be well to add that Gainford is in the lower valley of the Tees, not far from the banks of the river, about five miles east of Rokeby, and half way between Barnard Castle and Darlington.

HEAVY LOCAL HAILSTORMS.

To the Editor of the Meteorological Magazine.

SIR,—Since I first came to this place, in March, 1874, no hailstorms worth mentioning have occurred here until the thundery period from the 18th to the 26th (inclusive) of last month. In this period we experienced hailstorms of a severity which was very remarkable indeed, considering that no very great amount of hail is reported to have occurred over the country generally. I send some notes of these storms.

The first, and by far the most severe, took place on the morning of May 18th. On the previous evening the S.W. wind, which had blown freshly, died down rather suddenly, and much cirro-stratus came over from S.S.W., radiating from the same point, while the sky at sunset continued clear in W.N.W., and nearly so in E.S.E. At 3.5 a.m. of the 18th, I was awakened by the thunder. At that time the sky was overcast (except in distant N.W., where it was clear), apparently with thick cirro-stratus and cumulo-stratus at a great height, moving from S.S.W. over a light E.S.E. breeze. Thunder and lightning were frequent 9 or 10 miles to S.E., and occasional overhead, with gushes of moderately hard rain. This continued and gradually increased for two hours, spreading slowly towards W. and N.W., while the clouds became increasingly stormy though still at a great elevation. Just before 5 a.m. the thunder and lightning increased in the immediate W., and in the zenith. At 5.5 the sky had almost cleared (and very suddenly) in the E., while immediately overhead hung one of the most awful-looking clouds that it has ever been my privilege to see. At this time the flashes were so near as to render observation somewhat unpleasant. Between the claps a very loud roar could be heard overhead, the cause of which was soon apparent. It began to rain and hail with excessive violence; and never before had I seen meadows which previously had no water visible on them covered with water in a few minutes. Most of the hailstones were of the size of small hazel-nuts, but mingled with these were others as large as walnuts. About one of these latter fell on every square foot of surface, as I should judge by their appearance after the storm, and by the rents made in glass, and the foliage of rhubarb, cabbage, &c. At 5.10 the surface-wind veered to S.S.W., and at 5.15 the storm ceased, thunder and lightning continuing, but

RAINFALL A

COUNTY

Latitude 54° 32' 53" N.

Diameter of Guage, 5 inches. Height above gr

YEARS 1868-1

Year		JAN.	FEB.	MAR.	APRIL	MAY	J
1868	Inches	2.330	0.660	0.610	2.600	1.020	0.
1869	"	3.310	1.400	2.070	1.540	3.490	1.
1870	"	1.560	2.140	1.350	0.450	0.520	1.
1871	"	1.070	1.540	1.070	2.860	1.280	3.
1872	"	3.100	2.740	4.410	2.490	1.000	2.
1873	"	1.810	1.200	2.280	0.660	1.920	1.
1874	"	1.810	1.540	1.100	1.280	2.860	1.
1875	"	2.380	1.210	0.840	0.840	1.060	1.
1876	"	0.305	1.960	3.245	2.680	0.720	2.
1877	"	4.215	1.520	2.580	3.800	2.270	1.
Average of 10 years each month	Inches	2.189	1.591	1.955	1.920	1.618	1.

The greatest fall occurred in 1872—41.010, followed

The average of the 4 years, 1868-71, was 25.117, suc

The average of the 4 years, 1874-77 was 30.330.

AVERAGE QUARTERLY

First Quarter, 5.735. Second Quarter, 5.286.

The Maximum and Minimum Fall

				INCHES.	
Jan.	1869	..	..	3.310	Maximum.
Apr.	1877	..	..	3.800	"
Sep.	1871	..	..	5.520	"
Dec.	1876	..	..	7.210	"

Gainford, by Darlington, June 1st, 1878.

T GAINFORD,

DURHAM.

Longitude 1° 44' 15" W.

ound, 1 Ft. Height above Sea Level, 250 Feet.

877 inclusive.

JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	Total Inches
220	0·790	3·070	5·120	1·710	2·530	5·470	26·130
010	0·450	1·450	3·890	1·920	2·700	3·520	26·750
610	0·570	2·360	0·810	5·100	1·450	3·700	21·620
200	3·110	1·250	5·520	1·980	1·220	1·870	25·970
990	5·150	3·900	3·320	4·160	4·410	3·340	41·010
330	3·300	2·090	1·440	2·120	2·070	0·390	20·610
410	2·470	3·160	2·560	1·960	2·130	3·700	25·980
980	4·290	2·400	3·170	4·370	5·790	1·920	30·250
430	2·140	2·200	3·845	1·690	3·135	7·210	31·560
300	3·610	4·995	2·175	2·805	2·710	1·550	33·530
748	2·588	2·687	3·185	2·781	2·814	3·261	28·341

by the least in 1873—20 610; averaging 30·810.

succeeded by the two exceptional years, 1872-3.

FALL FOR TEN YEARS.

Third Quarter, 8·460.

Fourth Quarter, 8·856.

Is in each Quarter for Ten Years.

				INCHES.	
Jan.	1876	..	..	0·305	Minimum.
June	1868	..	..	0·220	„
July	1869	..	..	0·450	„
Dec.	1873	..	..	0·390	„

A. ATKINSON.

moderately, in N.E. and E. As much as 1·89 in. fell in this storm, of which, incredible as it may seem, I am sure that far the larger portion came down in ten minutes.

As far as I can learn, but little hail fell at any of the neighbouring villages, from two to three miles distant in several directions.

The barometer fell steadily, and I could not see that the mercury was affected by the down-rush of water.

Thunder was again frequent towards Birmingham at 9 a.m., and at 9.50 another thunderstorm passed over us from S.W. by S. to N.E. by N., but without hail.

A hail, or rather sleet, squall occurred on the morning of the 21st, and from noon to 0.50 p.m. we had a heavy thunderstorm from the N.W., during which much hail fell, but it was small and sleety.

On the 24th, at 2 p.m., we had again a thunderstorm, with hail, during a shift of wind from S.W. to N.N.E. As far as I can discover, this storm was rather local, and was heavier here and immediately to the S.E. of this place than elsewhere.

At 8 a.m. of the 25th a slight hail-shower passed over from N.W. At 10 a.m. a very violent thunderstorm broke over us from the same quarter, the hail, which was large and hard, completely covering the ground. At 11 we had again a violent hailstorm, but without thunder. In a shady situation I gathered handfuls of ice at sunset of that day.

At noon of the 28th a slight thunderstorm passed over us from E.S.E. ; but no hail fell in this storm.

Since the 25th we have had no hail. But at 4.30 p.m. of the 31st an exceedingly black cloud passed over, from which hung a fine water-spout, reaching, as I should judge, about half way from the cloud to the earth's surface, and distant between one and a half and two miles to the S.W. of this place. From the time I first saw it, it lasted about 10 minutes. The spiral motion in this spout was *with* watch-hands. No thunder occurred, and only a few drops of rain fell. The atmosphere was very calm, both on the earth and in the cloud. Electricity strongly negative.—Yours truly,

W. CLEMENT LEY.

Ashby Parva, Lutterworth, June 6th, 1878.

NATURAL HISTORY NOTES FOR 1877.

[Among the notes supplied by contributors to *British Rainfall* are many not bearing strictly upon that subject. I have, therefore, thought it better to group together the following and to insert them in these pages.—Ed.]

JANUARY.

19th.—*Diss* (IV). On this day I gathered a quantity of wild prim-roses, about 10 days earlier than I recollect to have seen them before.

21st.—*Warbledon Rectory* (II). Saw a butterfly about 2.30 p.m.

FEBRUARY.

- 11th.—*Addiscombe* (II). Almond trees in blossom.
 14th.—*Stanley* (IX). Blackbird in song.
 17th.—*Swallowfield* (II). Gathered some palm in full flower.
 18th.—*Addiscombe* (II). Elm trees in full blossom.
 20th.—*Addiscombe* (II). Iris reticulata in blossom in the garden,
 according to *Gardener's Magazine*, two months before its usual time.
 22nd.—*Harrow* (I). Apricots in blossom.

MARCH.

- 4th.—*Stanley* (IX). Robins building.
 20th.—*St. Lawrence* (II). Blackthorn in full bloom.
 30th.—*Stanley* (IX). Swallow arrived here.

APRIL.

- 2nd.—*Addiscombe* (II). Gooseberries and currants in blossom.
 4th.—*St. Lawrence* (II). Wryneck heard.—*Alderbury* (V). Wryneck heard.
 6th.—*Swallowfield* (II). Saw the first swallow.
 8th.—*Pinner Hill* (I). Swallow seen.—*Alderbury* (V). Nightingale seen on lawn.
 13th.—*Littlehampton* (II). Nightingale heard.
 14th.—*Littlehampton* (II). Swallow seen.
 17th.—*St. Lawrence* (II). Nightingale heard.
 19th.—*Pinner Hill* (I). Cuckoo heard.—*Cambridge* (III). Nightingale arrived.
 20th.—*Swallowfield* (II). Heard the cuckoo.
 21st to 24th.—*Addington* (III). Our summer visitors late in coming, cuckoo, swallows and nightingale all appearing during this time.
 22nd.—*Harrow* (I). Martins, cuckoo and swallows seen.—*Bristol* (VI). Swallow first seen.
 24th.—*Bristol* (VI). Cuckoo heard.
 27th.—*St. Lawrence* (II). Cuckoo heard.
 28th.—*St. Lawrence* (II). Lilac in bloom ; first dish of asparagus.
 30th.—*Harrow* (I). Swallows and fieldfares seen.

MAY.

- 11th.—*St. Lawrence* (II). First swarm of bees.
 15th.—*Addiscombe* (II). Persian lilac in bloom in garden.
 19th.—*Addington* (III). Swifts first seen.
 21st.—*St. Lawrence* (II). First swift seen.
 22nd.—*St. Lawrence* (II). First globe artichoke.
 26th.—*Addiscombe* (II). Strawberry, hawthorn and laburnum in blossom.
 29th.—*Addiscombe* (II). Rhododendrons in blossom.
 31st.—*East Layton* (X). Cuckoo heard.

JUNE.

5th.—*Stanley* (IX). Swifts hawking.
 12th.—*Diss* (IV). First wild rose.
 14th.—*St. Lawrence* (II). First dish of peas. Strawberries.
 16th.—*Stanley* (IX). Hawkweed in flower.
 19th.—*St. Lawrence* (II). Carted hay.
 20th.—*Addington* (III). Haymaking general.
 21st.—*Stanley* (IX). Rain in night; corn shot; haymaking begun.
 30th.—*Addiscombe* (II). Picked the first ripe strawberries on bank facing the N.—*Ilslington* (V). Hay harvest well secured.—*Church Stretton* (VI). The cuckoo sang throughout the last days of June, also on July 1st—a circumstance I never heard of before in this part of the country.

JULY.

11th.—*Partney* (VII). Cuckoo singing frequently.
 14th.—*Stanley* (IX). Corn laid by the gale, but recovered its upright position by the 23rd.

AUGUST.

11th.—*Diss* (IV). First wheat cut.
 14th.—*Addington* (III). I observed several specimens of the clouded yellow butterfly during the latter part of the month, which is very rare in this district, so much so, that I have only seen three specimens previously during twenty-three years.—*Diss* (IV). Harvest general.

SEPTEMBER.

15th.—*Diss* (IV). Harvest over.
 23rd.—*St. Lawrence* (II). The clouded yellow butterfly, "Edusa," has been most abundant this autumn, and I have also seen many pale clouded yellow "Hyale."—*Addington* (III). Observed a crow building a nest.
Ilslington (V). Corn harvest saved in first-rate condition, and good yield.—*Blencowe* (X). Corn harvest turned out well, plentiful and fairly housed; but the hay harvest was decidedly the most tedious on record, large plots of good hay never cleared at all. Potatoes small and much diseased; turnips the most signal failure of the year.—*Woodlands, Elterwater* (X). The foliage and brackens are very slow in assuming their autumnal colouring; very few nuts or blackberries have ripened this year for want of sun.—*Fort William Public School* (X). The harvest was not very unfavourable owing to dry weather in the latter part of September and beginning of October.

OCTOBER.

21st.—*Addington* (III). Swallows about in numbers.
 26th.—*Stanley Vicarage* (IX). Thrushes singing.

NOVEMBER.

13th.—*Swallowfield* (II). Sulphur butterfly seen.

14th.—*St. Lawrence* (II). Flight of swallows seen—*East Layton* (X). Roses in bloom.

15th.—*East Layton* (X). Polyanthus coming into bloom.

29th.—*East Layton* (X). Passion flower in bloom in open air.

DECEMBER.

1st.—*Brookwood, Hollington* (II).—Gathered a dish of green peas, and a bouquet of 30 kinds of flowers in open garden.

12th.—*Brampford Speke* (V). Ripe, well-flavoured, wild hedge strawberry gathered. Many wild flowers open then and afterwards.

24th.—*Brookwood, Hollington* (II). Gathered 15 kinds of flowers in garden.—*Week St. Mary* (V). Gathered wild strawberry ripe.—*Ilslington* (V). Fuchsias, hydrangeas, &c., almost in full bloom out of doors on Christmas Day.

THE WEATHER IN MAY.

THE distribution of pressure at the beginning of the month was much the same as at the close of April, and no important change took place until the 5th, when a well-marked depression lay over the Baltic; an area of high pressure lay over England, the north of France, the Netherlands, and N. Germany. The decrease over these Islands and France continued through the next day, when a large depression was shown on our S. W. coasts, moving in a N. N. W. direction. Pressure was decreasing over the North Sea, but was increasing elsewhere. A band of low readings (29·7 in.) lay over these Islands, whence pressure rose to 30·2 in. in the Gulf of Bothnia, and to 29·8 in. in the S. W. of France. The wind consequently varied between S. W. and N. W. in the south, and between N. E. and E. in the north. During this day (7th) a large shallow depression appeared in the S. E., but the relative distribution of pressure remained much the same.

On the 9th the barometer rose everywhere, except in the S. W. of these Islands, and the distribution of pressure had altered somewhat from the previous day; a large area of comparatively high readings (30·0 in.) lay over the North Sea, Denmark, and the S. of Norway, while a depression in which the lowest readings were 29·6 in. lay off the S. W. of Ireland. The sky was cloudy, except in Scotland, Denmark, and some parts of France. During the day the depression moved N. W., and the barometer rose in the S. and W., but fell slightly in the N.

On the 11th, a rather large disturbance lay to the westward of Ireland, while a small subsidiary depression was shown over S. Wales, and the wind on our western coasts increased to a moderate or fresh gale. The barometer continued to fall, and on the 12th pressure was in a very unsettled state; it was increasing a little in the S., and decreasing in the N.; the highest readings (30·1 in.) lay in the south of Sweden; the lowest (29·3 in.) off the west of Ireland; gradients were rather steep on our western coasts.

The barometer fell everywhere except the extreme S. of France on the 14th; a large area of low pressure lay off our western coasts, while a small local depression was shown near Paris. Readings were high both over the Baltic and the Mediterranean. On the 16th the mercury rose over all Western Europe, briskly over these Islands and France, less so over Scandinavia; in the latter part of the day the bar. fell very quickly in the N. of Ireland, while it still rose slightly in the S. E.; in consequence, gradients increased somewhat, and the S. wind blew stronger. The mercury continued to rise in the N., and on the morning of the 18th the change was more than half-an-inch, but in the S. and over France it was falling: a depression lay over the N. coast of Ireland in the morning, but by 6 p. m. it had advanced to the Hebrides, and there were indications of a fresh disturbance in the S. W. At Valentia a moderate S. S. W. gale took place.

After this the weather continued very unsettled, and numerous depressions passed over Western Europe. At first they passed across the N. part, but on the 23rd a deep disturbance advanced from Ireland and passed eastward across the S. part of Great Britain. An anti-cyclone (30·1 in.) lay over the Bay of Biscay and the W. of France, while a large area of low pressure, with its centre near Her-nösand (29·48 in.) was shown over Scandinavia. On the 24th the depression, moving eastward, gradually left our coasts, but the recovery in its rear was not very decided; the N.W. wind rose to a gale at the mouth of the Channel.

On the 26th the barometer rose in nearly all parts of Western Europe, but was rather unsteady in the south of Ireland. On the 30th a very shallow depression reached the W. of France, travelling in an easterly direction. The weather was clear and bright in N.W. Europe, and continued so on the 31st. H.E.M.

SUPPLEMENTARY TABLE OF RAINFALL IN MAY, 1878.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see Met. Mag., Vol. X., p. 28., but the list is under revision.]

Div.	Station.	Total Rain.	Div.	Station.	Total Rain.
		in.			in.
II.	Acol	3·37	XI.	Solva	2·58
„	Littlehampton	3·56	„	Castle Malgwyn	4·49
„	Hailsham	3·94	„	Nantgwilt, Rhayader	6·83
„	St. Lawrence, I. of W....	2·77	„	Carno	5·51
„	Strathfield Turgiss	2·57	„	Rhug, Corwen	4·42
III.	Addington Manor	4·89	„	Port Madoc	3·92
„	Oxford	5·08	XII.	Carsphairn .....	...
„	Northampton	4·06	„	Melrose	4·66
„	Cambridge	3·60	XV.	Gruinart	2·52
IV.	Sheering	4·64	XVI.	Grandtully .....	...
„	Diss	4·69	XVII.	Tomintoul	1·98
„	Swaffham	4·22	„	Keith	3·24
V.	Alderbury, Salisbury ...	4·16	XVIII.	Dalwhinnie	4·00
„	Compton Bassett	4·43	„	Auchnasheen	4·42
„	Dartmoor	8·85	„	Springfield, Tain	2·92
„	Teignmouth	4·83	„	Glenfinnan	6·83
„	Langtree, Torrington ...	7·54	XIX.	Watten	1·61
„	Cosgarne, St. Austell ...	5·53	XX.	Glenville, Fermoy	6·19
„	Taunton	3·96	„	Tralee	4·91
VI.	Bristol	6·20	„	Tipperary	4·73
„	Sansaw	4·38	„	Newcastle W., Limerick ..	4·02
„	Cheadle	4·70	„	Kilrush	2·81
„	Bickenhill Vicarage	5·95	XXI.	Kilkenny	3·91
VII.	Coston, Melton Mowbray ..	3·76	„	Kilsallaghan	4·87
„	Bucknall	4·00	„	Twyford, Athlone	3·99
VIII.	Walton, Liverpool	3·39	„	Belvedere, Mullingar ..	4·67
„	Broughton-in-Furness ..	4·15	XXII.	Ballinasloe	4·36
IX.	Stanley, Wakefield	4·12	„	Kylemore	6·33
„	Mickley, Ripon	5·74	„	Carrick on Shannon	4·47
„	Whitby .....	...	XXIII.	Rockcorry	4·50
X.	Gainford	4·08	„	Warrenpoint	5·87
„	Unthank Hall	4·35	„	Newtownards	4·20
„	Shap	5·62	„	Bushmills	3·06
IX.	Llanfrechfa	6·81	„	Buncrana	3·96

MAY, 1878.

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 Nights below 32°	
		Total Fall.	Differ- ence from average 1860-5	Greatest Fall in 24 hours.		Max.		Min.					
				inches.	inches.	in.		Dpth	Date.	Deg.	Date.	Deg.	Date.	In shade	On grass.
I.	Camden Town	3·89	+ 1·49	1·71	7	19	74·9	18	36·7	21	0	0	
II.	Maidstone (Hunton Court) ..	3·66	+ 1·42	·58	23	20	...	...	...	...	...	...
III.	Selborne (The Wakes)	4·97	+ 2·49	·85	16	21	68·0	11	35·0	5	0	0	
III.	Hitchin	4·69	+ 2·76	1·05	7	23	67·0	2	35·0	20	0	...	
IV.	Banbury	5·11	+ 2·89	1·01	7	25	69·5	18	35·0	31	0	...	
IV.	Bury St. Edmunds (Culford) ..	4·73	+ 2·57	1·56	7	23	74·0	2†	35·0	20	0	2	
V.	Norwich (Sprowston) .....	...	...	...	...	...	...	...	...	...	...	...
V.	Bridport	6·10	+ 4·07	1·96	10	18	...	...	...	...	...	...
VI.	Barnstaple	4·82	+ 2·38	·83	13	23	70·0	11†	41·0	24	0	...	
VI.	Bodmin	6·87	+ 4·41	1·30	10	25	66·0	18	41·0	5	0	0	
VII.	Cirencester	4·64	+ 2·36	·83	16	27	...	...	...	...	...	...
VII.	Shifnal (Haughton Hall)	5·95	+ 3·69	1·08	10	26	67·0	1	36·0	21	0	0	
VII.	Tenbury (Orleton)	6·12	+ 3·24	1·23	10	25	68·0	18	33·8	21	0	1	
VII.	Leicester (Town Museum)	4·71	...	1·14	7	25	69·5	18	36·9	21	0	3	
VIII.	Boston	4·00	+ 3·06	·66	8	24	76·0	12	35·0	21	0	...	
VIII.	Grimsby (Killingholme)	2·25	...	·45	7	21	67·0	12||	36·0	21	0	...	
VIII.	Mansfield	4·87	...	·55	8	23	70·2	5	35·8	21	0	0	
IX.	Manchester (Ardwick)	3·43	+ 1·05	·35	29	27	76·0	6	38·0	21	0	...	
IX.	York	3·55	+ 1·60	·47	14	18	71·0	6	34·5	21	0	...	
X.	Skipton (Arncliffe)	6·47	+ 3·12	·95	15	22	73·0	5	31·0	20	...	...
X.	North Shields	1·89	— ·75	·40	7, 18	16	...	...	...	...	...	...
XI.	Borrowdale (Seathwaite)	9·30	— ·24	1·06	18	22	...	...	...	...	...	...
XI.	Cardiff (Crockherbtown)	4·32	...	·71	16	24	68·2	31	38·1	21	0	...	
XI.	Haverfordwest	5·38	+ 2·66	1·30	10	19	65·0	10§	36·0	20	0	2	
XII.	Aberdovey	3·99	...	·61	10	20	78·0	29	42·0	21	0	...	
XII.	Llandudno	2·45	+ ·07	·31	27	22	71·0	12	39·6	21	0	...	
XII.	Dumfries (Crichton Asylum) ..	4·85	+ 2·42	1·21	28	21	68·2	7	35·0	21	0	0	
XIII.	Hawick (Silverbut Hall)	3·91	...	·54	7	19	...	...	...	...	...	...
XIII.	Glasgow (Cessnock Park)	2·90	+ ·52	·58	14	24	...	...	...	...	...	...
XIV.	Mull (Quinish)	2·25	...	·57	16	19	...	...	...	...	...	...
XIV.	Loch Leven	4·70	+ 2·50	·80	8	16	...	...	...	...	...	...
XV.	Tyndrum (Ewick)	6·20	...	...	...	...	...	...	...	...	...	...
XV.	Arbroath	1·88	— ·10	·46	19	15	64·0	17¶	35·0	20	0	...	
XV.	Braemar	2·30	+ ·50	·44	19	13	67·2	5	26·0	10	2	11	
XVI.	Aberdeen	2·13	...	·47	21	15	65·2	16	37·7	21	0	2	
XVI.	Gairloch	3·38	...	·49	21	19	...	...	...	...	...	...
XVI.	Portree	3·50	— 2·15	·79	3	18	...	...	...	...	...	...
XVII.	Inverness (Culloden)	1·62	— ·06	...	...	18	69·4	6	33·4	9	0	8
XVII.	Dunrobin	2·75	+ 1·30	·81	19	15	65·5	5	34·5	21	0	...	
XVIII.	Sandwick	2·91	+ ·65	·69	27	18	60·4	15	33·9	21	0	1	
XVIII.	Caherciveen Darrynane Abbey ..	4·50	...	·41	14	24	...	...	...	...	...	...
XVIII.	Cork	5·68	...	·72	17	21	...	...	...	...	...	...
XIX.	Waterford	4·81	+ 2·56	·74	10	22	64·0	1, 29	38·0	21	0	...	
XIX.	Killaloe	4·48	+ 1·30	·97	13	23	74·0	29	35·0	21	0	...	
XX.	Portarlington	4·45	+ 1·25	·88	10	26	66·0	17	40·0	20	0	...	
XX.	Monkstown, Dublin	5·03	+ 3·12	·80	10	21	75·0	29	33·0	22	0	...	
XXI.	Galway	3·36	...	·59	11	21	65·0	6**	41·0	30	0	...	
XXI.	Waringstown	3·91	...	·40	14	22	70·0	1, 4	36·0	21 †	0	...	
XXII.	Edenfel (Omagh)	4·02	...	·50	14	23	66·0	5	35·0	29	0	0	
XXII.	Ballyshannon	4·01	...	·54	15*	22	...	...	...	...	...	...

* And 22.

† And 12, 17, 18.

‡ And 18, 19.

|| And 18.

§ And 11.

¶ And 30.

** And 11, 12, 29, 30.

†† And 31.

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

METEOROLOGICAL NOTES ON MAY.

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.

SELBORNE.—The beginning of the month particularly favourable both for gardens and the cereal crops, but the continuous wet afterwards led to much misgiving as to the wheat and barley. T and L all the night of the 16th, and a violent H storm in the morning of 17th, not lasting more than five minutes, nor extending more than about a mile in either direction. The hailstones were as large as marbles.

BANBURY.—H on 20th, 21st, and 25th; TS at 3 a.m. on 18th, tree struck; T and L on 10th and 25th, L on 1st, T on 2nd and 28th.

CULFORD.—Rainfall considerably above the average; mean temp. 56°, which is also above the average. Considerable electrical disturbance during the latter half of the month; Polar winds prevailed on 14 days; T showers on 1st, 17th, 18th, and 25th; TS on 21st, 24th, 26th, 27th, and 28th; H on 21st and 25th; high wind on 16th and 19th.

BODMIN.—Mean temp. 56°·6.

SHIPNALL.—The wettest May here for 44 years at least, nearest approach in 1869 when 4·73 in. fell. Also the wettest month in that period, with the exception of November, 1852 (6·59 in.). R daily till 29th with two exceptions (4th and 5th); T on 1st, 14th, 27th, and 28th. Wonderful growth of vegetation till 21st, when it was checked by sudden cold. Meadows flooded, farmers unable to get in their swedes, &c. Apple in blossom on 3rd; hawthorn on 12th; oak in leaf on 7th; ash very late; swifts arrived on 9th, flycatcher on 19th. Transit of Mercury on 6th, obscured by dense cloud.

LEICESTER.—T and L between 7 and 8 p.m. on 1st; heavy R on 7th; T L H and S on 14th; H on 15th; TS on 18th; T and gale on 21st.

BOSTON.—The heavy rains did not cause any floods or damage to the crops in this immediate neighbourhood, but on the Welland both Cowbit and Crowland washes have been flooded to the depth of about 4 feet. The hay crops, and where the land has been broken up, crops of mustard and barley, will be seriously damaged by the sediment from the water. The rainfall is the heaviest recorded in this district in May, the next being 3·86 in. in 1869, and 3·48 in. in 1860. Several TSS during the month. May in flower about the 11th; lilac and laburnum about the 18th; spring flowers and foliage very luxuriant.

KILLINGHOLME.—Though R occurred on 21 days, no great weight fell. Sunshine was deficient, but crops of all kinds are very promising. Remarkably few of our migratory birds have arrived. T on 1st, 2nd, 12th, 14th, 18th, and 28th; L on 14th and 18th; H on 14th.

MANSFIELD.—TS on 1st; continuous R all day on 8th; heavy TS with H between noon and 1 p.m. on 18th.

MANCHESTER.—The month opened with genial weather and refreshing showers, which promoted vegetation rapidly, but unfortunately instead of clearing up, the weather continued dull and showery through the whole month, and although the rainfall was not heavy, it left the impression of a very wet, cold month. Cold E. wind prevailed in the early part; T on 1st and 11th.

ARNCLIFFE.—Village green white with S at 4 a.m. on 20th.

NORTH SHIELDS.—TS on 12th, 14th, 15th, 18th and 26th.

WALES.

HAVERFORDWEST.—Night temperatures much above the average for May. The wettest May during the last 29 years, with the exception of 1869, when 5·69 in. fell. The TS of the 10th and 11th was very severe, it ushered in a very chilly wet period; for 16 days R fell uninterruptedly. Oak in full leaf, but ash very backward; vegetation very advanced; the corn has suffered in some districts from the incessant cold R.

ABERDOVEY.—A wet month, generally cloudy, with frequent showers; T on 18th.

LLANDUDNO.—Though there were a considerable number of very fine days, the month was on the whole cold, the mean temp. being no less than $5^{\circ} \cdot 5$ below that of last May, and about 3° below the average. There was no frost, but we had a cold wave on the 8th and 9th, and another of more extended range from the 19th to the 25th. All crops in this neighbourhood are looking well, fruit included. The rainfall was pretty equally distributed from the 6th to the 27th; H and S on 21st; laburnum in bloom on 1st, hawthorn on 4th, lilac on 6th, horse chestnut on 10th, mountain ash on 19th, elder on 20th, hedge roses on 30th, common poplar in leaf on 13th, swifts seen on 3rd, ten days earlier than last year.

SCOTLAND.

DUMFRIES.—A mild moist month, rainfall and temp. being considerably above the average; T and L on four days; winds generally moderate; mean height of bar. below average.

HAWICK.—Rainfall more than double the average; prevailing winds, easterly; hills white with S on 19th and 20th; slight touch of frost on night of 19th; T on 12th, 13th, and 28th; hay-crop early and will bulk largely; gooseberries a very irregular crop; red, white, and black currants very promising; apple-trees literally covered with blossom.

BRAEMAR.—A month of fine seasonable weather; T on 18th, 27th, and 28th.

ABERDEEN.—A month of rather dull weather, but on the whole, fine; rainfall a little above the average; temp. about the mean, or a little above; T and L on 16th and 26th, S and sleet on 20th; H on 21st.

PORTREE.—A very fine month; enough moisture for vegetation, but not enough to hinder agricultural operations; S on hilltops, 20th to 23rd inclusive; a fine meteor from S.E. to S.W. at 10 p.m. on 7th.

DUNROBIN.—The month was uncommonly favourable for bringing forward all kinds of vegetation. The S and sleet, and rather low temperature, towards the end, checked growth somewhat, but about here seems to have done no great harm. T and L on 13th.

SANDWICK.—The S.E. wind that was so persistent during April, prevailed generally till the 19th, and from that time the N. winds have kept the air cold, a hill 1,500 feet high being covered with S on 20th and 21st; aurora to zenith on 14th.

IRELAND.

DARRYNANE.—If there be any truth in the old saw:—

“A wet and windy May

Fills the haggart* with corn and hay”—

the harvest of this year should be good, for the past month was very wet and stormy. Wind very variable early in month, but from 13th to 26th was very fresh from S.W. and N.W. The wettest May of the last nine years; last four days very fine and summer-like.

KILLALOE.—Entire absence of frost, with abundance of R, and mean temp. above the average, have promoted early and forward vegetation; agricultural prospects good.

MONKSTOWN.—A month of almost continuous R, nearly half the total fall for the past five months being registered in it. The last four days were extremely fine, with E. winds.

WARINGTOWN.—Very favourable; crops most promising; last four days a little cold.

ENNEL.—A rainy, humid month, without frost, and highly favourable for vegetation, which has never been more forward and luxuriant at this season.

BALLYSHANNON.—The month, though more than usually wet, has been a favourable one for the growth of crops, all of which are promising well. There was slight frost on several nights, which damaged the fruit trees. Rainfall 1·35 in. more than corresponding period in 1877.

* Stack yard.