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LONDON FOG.

(*Concluded from page* 163).

SINCE our last number the discussion, and printing, and talking about the Fog Question has been as vigorous as ever, and with the exception of one day (Sunday, January 2nd) fogs have been slight or *nil*. This shows plainly that we were right in affirming that fogs are not increasing in intensity, and it shows also that they are not proportional to the number of chimneys. We are no friends to smoke—far from it; but we see, or think that we see, a large amount of money profit being attempted to be made by stove-makers, and dealers in anthracite coals, and of cheap popular renown by others, and as far as lies in our power we wish to prevent our readers and the public being used as puppets.

That the London atmosphere could, and should, be kept cleaner than it is, no one would be so silly as to deny; and that if the existing law were enforced there would be a perceptible improvement we firmly believe.

The existing arrangement, whereby about half a cubic foot of coals is put in a recess in one side of a room, surrounded on three sides with brickwork, and with a shaft above it to carry off the heat, and much of the carbon, and supplied with air sucked along the floor over the feet of the occupants so as to cool them, is in nearly every respect so injudicious that no one can be astonished at there being a rebellion against so wasteful and inefficient a system.

But we protest against this question being pushed by exaggerated or untrue statements. The actual facts are strong enough, and though exaggeration may succeed temporarily it does not often do so permanently.

As to the precise causes of the formation of fog, a very remarkable paper appeared in *Nature* of December 30th, and, although we reserve our acceptance of the views enunciated, we think it of sufficient importance to direct attention to it. It is evident that much thought is being directed to the two separate questions—the cause of fog, and the best way of warming dwellings. No one could do otherwise than wish success to real investigators of both questions.

REVIEWS.

The Rosarian's Year Book for 1881. Edited by the Rev. H. HONYWOOD D'OMBRAIN, Hon. Sec. of the National Rose Society. Sq. 8vo., vi.-82 pages. London : Bemrose and Sons. 1881.

WE do not presume to criticise this work in its principal features, but as the Rose-growing world is interesting itself very judiciously in tracing the relation between rose triumphs and climatic varieties, it would be ungracious not to offer a word of welcome and encouragement to its efforts.

As regards the Meteorological branch of this nicely got up little manual, we may draw special attention to Mr. G. Baker's paper "On the effect of Severe Winter on the Unripened Wood of the Rose," and to that on "The Weather of the Past Rose Year," by Mr. E. Mawley, F.M.S. and Hon. Sec. National Rose Society. There is a chatty paper on "The Rose of Poetry," by the Rev. Alan Cheales, in which we notice one or two little errors. The chief one is with reference to the inscription in the Chapter House of York Minster. Mr. Cheales says "An idea the York Cathedral chapter afterwards utilised in favour of their beautiful chapter house—

"Ut Rosa flos florum,
Sic Tu domus domorum."

Feeling sure that the above was incorrect, we turned to Drake's *Eboracum*, and there found the inscription given in what is beyond our printer—viz. Old Saxon—somewhat as follows :

UT ROSA PHLOS PHLORUM, SIC EST DOMUS ISTA DOMORUM.

Here are two or three puzzles, not at all meteorological, but which perhaps there is no harm in mentioning :—

(1). As the author knew Latin sufficiently to compose this, why was it not written in Roman letters.

(2). There was a true F in Saxon, why then spell Flos "Phlos."

Mr. Mawley is so extremely desirous of being correct, that he will not thank the printer for making him say that in October, 1879, "Only seventeen days were entirely free from fog, and between the "10th and 14th water was deposited in the funnel of my rain gauge "by heavy dews and fogs alone, to the most unusual depth of "0·3 inches." We do not believe that London has a monopoly of fogs, but neither do we believe that Croydon fogs could ever yield "0·3 inches in three days." Of course it should be 0·03 inch, and we merely mention it as a proof, for those who need it, that no amount of care will ensure absolute freedom from error.

We cannot better indicate the class of work which Mr. Mawley is devoting to the subject, or our appreciation of it, than by reprinting the concluding paragraphs of his paper :—

"It may not be inappropriate to offer in conclusion a few remarks upon what I conceive to have been the cause of the Hereford Roses cut from maiden plants occupying so prominent a position at the exhibitions of the present year, when,

generally speaking, those from most other localities were so far below their usual standard.

RAINFALL AND TEMPERATURE FOR THE FOUR MONTHS ENDING JUNE 30, 1880.

	Croydon.	Hereford.	*Difference
Mean of highest day temperatures	58°·6	57°·9	0°·7 *b*
Mean of lowest night temperatures	42°·0	41°·4	0°·6 *b*
Lowest night temperature registered	25°·8	26°·4	0°·6 *a*
Mean temperature of the 4 months	50°·3	49°·6	0°·7 *b*
Number of Frosts (Stevenson-screen)	9	9	—
Total Rainfall	6·305 in.	7·671 in.	1·366 in. *a*
Heaviest in any one day.....	0·663 in.	1·173 in.	0·510 in. *a*
Number of rainy days.....	43	53	10 *a*

* In this column *a* indicates Hereford above Croydon, *b* Hereford below Croydon.

"From the above table it will be seen that, though speaking generally, the weather at Hereford during this period was colder than that experienced in the neighbourhood of London, yet the greatest cold registered was rather less severe, and the number of frosty nights precisely the same in both districts. The sharpest frost of the previous winter appears to have been, moreover, equally as intense in Croydon as at Hereford. When, however, we turn our attention to the particulars relating to rainfall, we find that at Hereford the total of these four months exceeded that at Croydon by nearly 1½ inches, and that the number of rainy days was ten more in the former locality than in the latter. The last named differences are important themselves, considering the dryness of the spring months; but it is rather to the very different way in which the heavier falls were distributed at the two places, than to the aggregate amounts deposited at each, that I here wish more particularly to direct attention. In March rain fell at Croydon to amounts exceeding ·10 inch on only two days (2nd and 31st), but at Hereford on five days (1st, 2nd, 3rd, 9th, and 31st.) In April, at Croydon, on six days (2nd, 5th, 13th, 14th, 15th, and 19th), but at Hereford, on only four days (1st, 3rd, 4th, and 15th.) In May, at Croydon, on but one day, and that the last day of the month. In other words, between the 19th of April and the 31st of May, or for six weeks, there occurred no rain likely to have had any appreciable influence upon the growth of Rose-plants in a dry season. Indeed, from the 19th of April to the 15th of June, or for two months, no fall of rain amounting to a quarter of an inch in depth took place in this neighbourhood. At Hereford, on the other hand, the heavier falls in May were thus distributed:—·11 inch on the 3rd, ·17 inch on the 10th, 1·17 inches on the 26th, ·20 inch on the 27th, ·13 inch on the 28th, ·21 inch on the 30th, and ·16 inch on the 31st. There is no need for us to carry our investigation into June, as that month proved equally wet in both localities.

"To state the case more simply, just at that particular time in May, when I was entering this note in my journal, "Warm rain now greatly needed," it appears that rain was falling very heavily at Hereford for many consecutive hours, and I take it to have been this one day's fall more especially which turned the scale in favour of the Hereford plants, and tided them safely over the most critical period of their growth. And it has also occurred to me that the great depth of rich soil in the Hereford Rose-gardens, and its medium character, must afford the roots some permanent protection from extreme weather of all kinds. Though, doubtless, the two lighter falls of rain which took place earlier in the same month, and the colder weather experienced in the West of England during April, may also have been of service as helping to maintain a more uniform rate of progress than fell to the lot of Roses growing in many other

arts of the country, showing that we English Rosarians, however greatly we may pride ourselves upon our soil, our skill in culture and our climate, are, after all, very much at the mercy of the seasons as they come round."

Annali dell' Ufficio centrale di Meteorologia Italiana. Serie II., Vol. I., 1879. 742 pp., 17 plates. Folio; Roma, 1880.

ON the occasion of the Congress of Sciences, held at Palermo in August, 1875, a Commission was appointed by the Italian Government for the discussion of a programme relative to the centralisation of the various meteorological services in Italy, a report of which is to be found in the supplement to the *Meteorologia Italiana* for 1875; and in the following year Senator Cantoni, of Padua, attended a meeting of the International Meteorological Committee in London, a full report of which he presented to his Government. In consequence of this report, and of the representations made by the Palermo Commission, the Italian Government, by a decree dated the 26th of November, 1876, nominated a Meteorological Council, consisting of eight members, the result of which was the establishment of a Central Meteorological Office for Italy, in August, 1877.

We have lately received from Prof. P. Tacchini, the Director of the Office and a member of the Council, representing the Ministry of Agriculture and Commerce, the above named first volume of its annals, for the year 1879. It is said to be Series II.; we presume that the first Series would be the *Meteorologia Italiana* which has been regularly published since 1865, under the superintendence of the Ministry of Agriculture.

This splendid volume has for its frontispiece an excellent portrait of the late Father Angelo Secchi (died 1878), well known as the former Director of the Meteorological Observatory of the Roman College, and first President of the Italian Meteorological Council. The introduction contains (1) a summary of the discussions at the meetings of the Council between March, 1877, and April, 1879, which gives much information respecting the details of the methods of observation, and the instruments used at the various stations. The fundamental system consists of 69 stations, situated at or near the principal cities, in addition to a large number of subordinate stations selected from local considerations. (2) An account of the observations in the interest of agriculture. These observations are taken at 38 stations, and the results, including daily extremes of temperature, rainfall, thunderstorms, &c., are published every ten days, and copies to the number of 2,500 are distributed to the various Chambers of Commerce, Agricultural Committees, &c. (3) An account of the telegraphic meteorological service. These reports are published in a daily bulletin, and contain, in addition to the observations from Italian stations, reports or *resumés* from London, Paris, and St. Petersburgh, and occasionally other notices, *e.g.* the warnings issued by the *New York Herald* Office.

The contents of the volume are divided into three principal parts, of which the following brief summary may give some idea.

Part I. is devoted to a series of interesting memoirs by vario authors. We may mention, *inter alia*, (*a*) an account of a remar able thunderstorm at Mantua, on the 25th July, 1878, accompani by a fall of salt hail, supposed to have been formed from se water, carried into the air by a waterspout; (*b*) a comparison results obtained by the use of Regnault's Hygrometer, and of t Dry and Wet-bulb thermometers, with an arrangement for aspiration. The author (Dr. Chistoni) states that the result of these experiments, which were continued for a whole year, gives reason to hope that a formula for psychrometrical observations will be eventually found which will give more satisfactory results, especially for low temperatures, and that this formula will form the object of a future study. Such a formula would be heartily welcomed by all meteorologists. We are glad to see from the Report of the Meteorological Council (London) for 1879-80, just issued, that hygrometrical investigations are being undertaken for the Meteorological Office by W. N. Shaw, M.A., of Cambridge, who has already presented a preliminary report upon this intricate and important subject. (*c*) A paper on the meteoric dust and other substances contained in a Scirocco storm, illustrated by coloured plates of microscopic specimens.

Part II. contains the observations printed *in extenso*, taken at 78 stations three times a day during the year 1879, together with 10-day, monthly, and annual means. Some of these stations are situated at great altitudes, the highest being at Valdobbia, about 8660 feet above sea-level. The publication of these observations, on the plan adopted by the International Meteorological Committee, is of the greatest importance for the science of meteorology, and, excepting perhaps the Russian system, is probably the most extensive network in existence.

Part III. gives a special description of the instruments in use at the Observatory of the Roman College, and contains the observations made there in 1879, together with monthly reviews and various astronomical observations. This series is intended to form a continuation of the observations published for many years by Father Secchi in the Meteorological Bulletin of the Roman College, and, in order to render the series complete, the results for the years 1877–78 have been added.

The production of this valuable addition to our meteorological knowledge, and in so short a time after the actual date of the observations, reflects great credit upon the Italian Central Office, and places Italy among the foremost of nations dealing with this important branch of physical science.—[J. S. HARDING.]

THE METEOROLOGICAL SOCIETY.

THE usual monthly meeting of this Society was held on Wednesday, the 15th inst., at the Institution of Civil Engineers, Mr. G. J. Symons, F.R.S., President, in the chair. F. Coventry, J. W. Moore, M.D.,

W. T. Paulin, J. Porter, and Captain W. C. Smith were balloted for and elected Fellows.

The following papers were read:—(1) "Report on the Phenological Observations for the year 1880." By the Rev. T. A. Preston, M.A., F.M.S. Agriculturally speaking, the year may be considered as disappointing. Till June the weather was such as has rarely been experienced for farm operations. The severe cold of the winter broke up and mellowed the soil, and the dry open weather enabled farmers to clean their land from the excessive growth of weeds caused by the damp of the year before. The dry May was not favourable for the hay, which suffered severely in some places, but still a crop with far more real nourishment in it than would be obtained from a rank growth would have been secured had it not been for the terrible floods of July in the midland counties, which not only seriously injured the crop, so that it was frequently not worth the trouble of removing off the land, but also carried it entirely away in low-lying districts. The corn, again, which was looking most promising till July, suffered much during that damp period, and had it not been for the subsequent fine weather would have been ruined. But the unfavourable season of 1879 produced very serious effects on vegetation, especially on trees and shrubs, and their produce. The young wood of the trees was not ripened, and as a natural consequence the severe winter killed an enormous quantity of some kinds, and greatly injured others. "Laurustinus" was generally killed to the ground, and in some districts the destruction of other shrubs was severely felt. The evergreens in many cases lost large quantities of their leaves—hollies especially are mentioned by several observers, and privet hedges were sometimes quite leafless. With respect to fruit trees, apples and pears in some localities (but not all) were hardly able to put forth any bloom, and the crops were consequently extremely poor. Wall fruit was also a general failure, but this was partially owing to severe weather when the trees were in bloom, for in some instances the show of bloom was splendid. Gooseberries and currants produced enormous crops, and strawberries were very fine, but they lasted an unusually short time. Seeds generally ripened with difficulty; much of the corn could not be ground, and a great deal was mixed up with roughly ground Indian corn, and flavoured to induce the cattle to eat it. The crop of ordinary garden seeds was also far below its usual quality, and some of the favourite garden flowers were consequently very poor.

(2) "On the Variations of Relative Humidity and Thermometric Dryness of the Air, with changes of Barometric Pressure at the Kew Observatory." By G. M. Whipple, B.Sc., F.R.A.S., F.M.S.

(3) "On the Relative frequency of given heights of the Barometer Readings at the Kew Observatory during the ten years, 1870–79." By G. M. Whipple, B.Sc., F.R.A.S., F.M.S.

SUPPLEMENTARY TABLE OF RAINFALL IN DEC., 1880.

[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	3·76	XI.	Corwen, Rhug	5·18
,,	Margate, Acol	2·91	,,	Port Madoc	9·02
,,	Littlehampton	4·28	,,	Douglas.....	3·94
,,	St. Leonards	5·00	XII.	Carsphairn	4·69
,,	Hailsham	4·64	,,	Melrose, Abbey Gate...	3·34
,,	I. of W., St. Lawrence.	5·28	XIV.	Glasgow, Queen's Park.	3·60
,,	Alton, Ashdell.....	3·78	XV.	Islay, Gruinart School..	6·07
III.	Great Missenden.....	3·63	XVI.	Cupar, Kemback.....	2·16
,,	Winslow, Addington ...	2·51	,,	Aberfeldy H.R.S.	...
,,	Oxford, Magdalen Col...	3·10	XVII.	Tomintoul.....	2.10
,,	Northampton	2·87	,,	Keith H.R.S.	3·01
,,	Cambridge, Merton Vil.	2·38	,,	Forres H.R.S.	3·01
IV.	Harlow, Sheering	2·83	XVIII.	Strome Ferry H.R.S....	5·00
,,	Diss	2·82	,,	Auchnasheen H.R.S. ...	...
,,	Swaffham	3·04	,,	Lochbroom	6·76
,,	Hindringham	2·68	,,	Tain, Springfield.....	2·10
V.	Salisbury, Alderbury...	3·68	,,	Loch Shiel, Glenfinnan.	11·00
,,	Calne, Compton Bassett	3·52	,,	Dalwhinnie H.R.S.....	...
,,	Beaminster Vicarage ...	6·27	XIX.	Lairg H.R.S.	...
,,	Dartmoor, Princetown..	...	,,	Altnabreac H.R.S.	...
,,	Langtree Wick	6·93	,,	Watten H.R.S.	5·08
,,	Lynmouth, Glenthorne.	7·34	XX.	Fermoy, Glenville	3·83
,,	St. Austell, Cosgarne...	6·50	,,	Tralee, Castlemorris ...	4·19
,,	Taunton	...	,,	Cahir, Tubrid	3·26
VI.	Bristol, Ashleydown ...	5·17	,,	Tipperary, Henry St....	4·74
,,	Ross	3·35	,,	Newcastle West	...
,,	Wem, Sansaw Hall.....	3·70	,,	Kilrush	3·89
,,	Cheadle, The Heath Ho.	5·12	,,	Corofin	4·90
,,	Bickenhill Vicarage ...	3·48	XXI.	Kilkenny, Butler House	...
VII.	Melton, Coston	2·63	,,	Carlow, Browne's Hill..	3·48
,,	Horncastle, Bucknall ...	1·95	,,	Kilsallaghan.....	...
VIII.	Walton-on-the-Hill.....	5·58	,,	Navan, Balrath	2·40
,,	Broughton-in-Furness ..	7·17	,,	Athlone, Twyford	3·51
IX.	Wakefield, Stanley Vic.	3·21	,,	Mullingar, Belvedere...	3·15
,,	Ripon, Mickley	4·49	XXII.	Ballinasloe	3·09
,,	Scarborough.....	2·85	,,	Clifden, Kylemore	7·50
X.	Mickleton.....	2·68	,,	Crossmolina, Enniscoe..	3·32
,,	Haltwhistle, Unthank..	5·25	,,	Carrick-on-Shannon ...	1·88
,,	Shap, Copy Hill	5·65	XXIII.	Dowra	4·20
XI.	Llanfrechfa Grange	5·26	,,	Rockcorry.....	2·91
,,	Llandovery	7·02	,,	Warrenpoint	2·23
,,	Solva	5·16	,,	Newtownards	2·40
,,	Castle Malgwyn	6·70	,,	Carnlough.....	4·30
,,	Rhayader, Nantgwillt..	9·09	,,	Bushmills	3·98
,,	Carno, Tybritle	8·91	,,	Buncrana	4·00

CLEAR NIGHTS.

To the Editor of the Meteorological Magazine.

SIR,—Have any of your readers observed, and if so, can they offer any explanation of the entire clearing of the sky that has occurred on so many nights, after dull or wet days, during the late autumn.—I am your obedient Servant, K.

London, 18th December, 1880.

DECEMBER, 1880.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1860–5	Greatest Fall in 24 hours. Dpth	Date.	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Date.	Min. Deg.	Date.	No. of Nights below 32°. In shade.	On grass.
			inches	inches.	in.								
I.	ENGLAND.	Camden Square	3·17	+ 1·67	·53	29	18	56·5	10	28·2	26	5	11
II.		Maidstone (Hunton Court)	2·37	+ 1·25	·64	19	17	...	...	...	...	...	...
,,		Strathfield Turgiss	2·68	...	·54	29	15	54·7	10	27·0	22	10	15
III.		Hitchen	2·45	+ 1·14	·34	29	19	52·0	22	26·0	21	12	...
,,		Banbury	3·02	+ 1·35	·50	22	20	54·8	10	25·0	22†	14	...
IV.		Bury St. Edmunds (Culford)	2·92	+ 1·43	·51	27	18	54·0	10	23·0	2	9	...
,,		Norwich (Cossey)	2·32	+ ·86	·43	30	21	54·5	10	28·0	3‡	11	11
V.		Bridport	4·22	+ ·85	·94	19	17	...	...	...	...	...	...
,,		Barnstaple	7·27	+ 4·15	1·24	14	21	55·0	23*	33·0	2, 18	...	...
,,		Bodmin	6·35	+ 1·11	1·12	19	24	55·0	5	31·0	26	3	4
VI.		Cirencester	3·73	+ 1·44	·47	19*	16	...	...	...	...	...	...
,,		Shifnal (Haughton Hall)	3·58	+ 1·90	·57	29	21	53·0	9	23·0	22	14	14
,,		Tenbury (Orleton)	3·45	+ ·99	·63	29	19	56·0	4	24·5	26	14	17
VII.		Leicester (Town Museum)	3·22	...	·37	26	23	54·3	6	25·5	3	9	23
,,		Boston	2·23	+ ·74	·52	14	16	54·0	6	29·0	27	10	...
,,		Grimsby (Killingholme)	2·95	...	·53	22	20	55·0	10	28·0	27	7	...
,,		Mansfield	3·16	...	·70	29	18	54·5	6	25·2	17	15	17
VIII.		Manchester (Ardwick)	5·29	+ 3·13	1·04	24	25	54·0	1, 6	23·0	28	13	...
IX.		York	3·72	+ 1·92	1·52	29	16	...	...	...	...	...	...
,,		Skipton (Arncliffe)	8·96	+ 4·41	1·95	22	26	57·0	6	22·0	22§	13	...
X.		North Shields	3·82	+ 1·62	1·07	29	19	55·2	6	24·5	18	11	13
,,		Borrowdale (Seathwaite)	15·22	— 1·73	2·20	22	27	...	...	...	...	..	...
XI.	WALES.	Cardiff	6·70	...	1·09	14	20	53·8	9	28·0	26	4	...
,,		Haverfordwest	5·94	+ 1·11	1·17	14	18	53·0	10	22·0	17	7	9
,,		Aberdovey	6·39	...	1·08	23	20	...	...	...	...	...	...
,,		Llandudno	5·40	+ 3·20	1·00	29	20	54·4	7	29·2	18	2	...
XII.		Cargen	2·58	...	·76	22	16	54·0	6	18·4	31	11	...
,,		Hawick (Silverbut Hall)	3·20	...	·65	22	21	...	...	...	...	...	...
XIV.		Douglas Castle (Newmains)	5·77	...	1·04	22	28	...	...	...	...	...	...
XVI.		Loch Long (Arddaroch)	8·01	...	...	...	...	...	...	...	...	...	...
,,		Kilmory	8·31	...	1·84	18	23	...	...	...	...	...	...
,,		Mull (Quinish)	5·43	...	·90	18	30	...	...	...	...	...	...
,,		Loch Leven	2·80	— ·92	...	...	...	...	...	...	...	...	...
XVII.	SCOTLAND.	Arbroath	1·66	— 1·08	·38	22	9	55·0	6	21·0	17	13	...
,,		Braemar	2·18	— 1·59	·32	11	20	53·2	6	—2·0	27	22	30
XVIII		Aberdeen	4·41	...	·79	24	25	55·0	6, 11	14·0	27	17	...
,,		Portree	7·38	— 8·25	·92	8	28	...	...	...	...	...	...
,,		Inverness (Culloden)	2·00	— ·07	...	...	..	54·3	5	17·5	28	16	24
XIX.		Dunrobin	4·25	+ 1·85	1·01	23	18	55·8	6	18·0	28	18	...
,,		Sandwick	4·54	+ ·57	·83	25	22	52·2	7	20·3	29	15	17
XX.	IRELAND.	Cork (Blackrock)	3·41	...	·69	27	19	57·0	9	25·0	17	12	...
,,		Darrynane Abbey	3·99	...	·50	20	30	...	...	...	...	...	...
,,		Waterford	2·87	— 1·55	·63	14	20	55·2	9	26·0	25	9	...
,,		Killaloe	5·23	+ 1·74	·94	14	23	55·0	9	21·0	30	10	...
XXI.		Portarlington	3·24	+ ·05	·67	14	22	54·0	5	25·0	29	15	...
,,		Monkstown	3·16	+ ·54	·71	14	17	...	...	...	...	...	...
XXII.		Galway	3·79	...	1·06	21	21	55·0	6	25·0	26‖	8	...
XXIII		Waringstown	4·05	...	1·20	22	23	55·0	5	20·0	26	15	18
,,		Londonderry	3·87	...	·63	22	26	54·0	5	23·0	28	7	15
,,		Edenfel (Omagh)	3·37	...	·67	22	23	54·0	5	18·0	26	18	...

* And 29. † And 26. ‡ And 17, 18, 22. § And 17. ‖ And 30.
+ Shows that the fall was above the average; — that it was below it.

METEOROLOGICAL NOTES ON DECEMBER.

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

ENGLAND.

STRATHFIELD TURGISS.—Brimstone butterfly flying on 4th; robin's nest with five eggs in it seen on 8th; nettle tortoiseshell fiying on 12th; first primrose gathered on 19th; vinca minor gathered on 23rd.

HITCHEN.—Extraordinary changes of temp. throughout the month, five separate times a range of more than 20° in 24 hours; unusually high max., 52° on 22nd. Everything out of season; primroses in blossom, and thrushes and blackbirds in full song. S on five days.

BANBURY.—S on five days; high wind on three days; fog on 8 days.

CULFORD.—Temp. throughout the month very changeable and trying; S on four days. Frost and S at the end of the month.

BODMIN.—A remarkably mild December; mean temp., 47°.

CIRENCESTER.—A few sharp frosts, but, on the whole, mild. Wind principally S.W. and N.W.

ORLETON.—Great fluctuations in pressure and temperature. Frost on the first three days, then warm, dry, and pleasant till the 13th. The remainder of the month was generally cold, with heavy falls of R and S, and only three dry days. About 4 inches of S on the ground on 27th; on 29th a heavy fall of R, which produced a greater flood in the river Teme on the 30th than that of November. Mean temp. of the month about 2°·5 above the average.

LEICESTER.—Sky unusually red at sunset on 9th, extending about 20° above the horizon; much fog, and a good deal of S. Lunar halo on 19th. Gale during the night of 30th.

KILLINGHOLME.—A fine winter month, the former part especially so, the latter part very wet, causing great floods in many places. No really severe weather; the growing wheat looks well, and roses and other garden trees are budding as in spring.

MANSFIELD.—S on seven days; frequent frosts, but none severe.

NORTH SHIELDS.—S on eight days.

SEATHWAITE.—S on nine days. Storms frequent at the beginning of the month.

WALES.

HAVERFORDWEST.—The first half of the month was mild and damp, the second half wet, heavy falls being frequent, more especially at night. Frosts at night from 16th to 30th, occasionally very sharp. Precelly range three times covered with S.

LLANDUDNO.—A mild, dull and wet month; mean temp. more than 4° above the average.

SCOTLAND.

CARGEN.—Mean temp. of month 39°·7, 0°·9 above the average.

HAWICK.—A remarkably beautiful sunset on the 9th, and on the night of the 13th a singularly beautiful lunar halo, and later on an exceedingly bright meteor to E. Terrible storm of S and wind on the 19th. No berries on holly or hawthorn, but an abundance of hips. S on ten days.

NEWMAINS.—S on ten days; total depth about 12 inches.

BRAEMAR.—Min. temp. on the 27th, —2°, the lowest registered since Dec. 25th, 1860. Lunar halo on 7th.

ABERDEEN.—South-westerly to westerly winds prevailed till the 10th, when a north-westerly course set in, lowering the temp. considerably, and continued to the close of the month, the weather being squally, with R, S, and H. Mist and haze were frequent; aurora was seen on three nights, and vivid L on Christmas night.

PORTREE.—A very stormy month; heavy S from the 14th to the 31st, with intense frost; a thaw commenced on the evening of the 31st, and by the morning the low ground was free from S.

CULLODEN.—Weather during the month severe, long continued frost and S; low temperatures recorded on the nights of 15th to 18th, 22nd, and 25th to 31st.

SANDWICK.—The month was very cold, wet, and stormy; mean temp. 3°·3 below the average of 53 years. The storms were frequent and severe, and I do not think my anemometer has ever before recorded so many miles of wind in a week as it did from the 8th to the 14th; on the 11th 12th and 14th there were upwards of 1,100 miles, each day and on the 12th there were 1,382 miles. There were gales also on 18th and 25th of from 50 to 55 miles an hour, but on the 12th it was as high as 67 miles, and on the 10th 68 miles an hour. There was some frost and S from 13th to 23rd, and on 24th a S storm began which blocked up the roads, not only here but through Scotland; on the last night of the year, however, the wind changed to W. and a thaw set in, which cleared the plains of S in two days. Auroræ on 26th, 27th, and 28th.

IRELAND.

DARRYNANE.—Very variable, but, on the whole, mild; a marked contrast to the two preceding Decembers. Cella Æthiopica in flower in the open air on 24th.

KILLALOE.—Fair average weather for the season. Some S from 18th to 27th, but lying only on the higher grounds. Frost on ten nights, but not of great intensity. Mean temp. above the average.

LONDONDERRY.—Some frost and S at intervals during the month; wind variable.

THE WEATHER IN DECEMBER.

CLOUDY or gloomy, but very mild, weather was general in our Islands during the first week.

The depression which was off the N. coast of Scotland at the close of November passed quickly E. ward in the course of the 1st and following night until, at 8 a.m. on 2nd, it was over S. Sweden. In its rear the bar. rose quickly; and an anticyclone was formed over England and France. Next day pressure decreased briskly over our Islands; but continued increasing in France and S.E. England: hence the anticyclone was now limited to France and the English S. and S.E. coasts. On the day following, however, the bar. rose generally in W. Europe; while in N. Scandinavia a slight fall took place: pressure became still higher (30·5) in France; and another anticyclone seemed to be developing over Sweden: in N. Norway and N. Scotland pressure was comparatively low. A rather brisk decrease of pressure occurred in N. Scandinavia on the 5th, a large but shallow depression being off the Norwegian coast, whilst in nearly all other parts of W. Europe the mercury rose. Readings now ranged from 30·6 in. over France to 29·6 in. in N. Norway. A decrease of pressure on the 6th caused the anticyclone to change its position from central France to S. England, the Channel, and N. France. Over N. Scandinavia a somewhat deep depression was shown.

Temp. was more than the average in all districts, the excess being 5° in S. Ireland and E. Scotland. The max. were generally high, ranging in most districts between 53° and 57°. The min. occurred generally on the 2nd and 3rd, when at Manchester the ther. indicated 23°, and 25° at Cambridge and Markree Castle.

Rainfall was slightly above the mean in Scotland; but considerably less in most English and Irish districts. Heaviest fall, 1·49 in., at Loch Sunart; lightest, 0·01 in., at Hereford and Oxford.

Bright sunshine was of extremely short duration throughout our Islands. Max. duration, 15 hours, at Kelstern and Cambridge; min., 2, at Pembroke.

The next week (7th–13th) was very dull, but mild and dry, everywhere. Towards the end of the period the weather became much less settled, and a little rain fell at all stations, except Bawtry, Southampton, and Plymouth.

In the course of the night (7th–8th) an important disturbance (28·8) advanced to the N. of Norway, occasioning a fall of the bar. amounting to 0·74 in. at Bodo, and a brisk fall over the whole of Scandinavia and the N. of the British

Islands. The anticyclone kept much the same position ; and pressure at the centre (30·7 in.) was higher than ever. In France, the greater part of England, and some places in Ireland, the bar. showed an inclination to rise. On the following day a rise of the mercury began in nearly all parts of our Islands, France and W. Norway, whilst in Sweden the bar. still fell ; a large area of low pressure was shown over Sweden and Norway, whilst the area of high readings, owing to the spreading in a S.W. direction of the area of low pressure, moved W.-ward, being, at 8 a.m. on 9th, over the Bay of Biscay. During the night (9th–10th) another rather deep depression travelled from W. to E. to the W. coast of Norway, producing a brisk decrease of pressure over the whole of W. Europe. The area of high pressure was now over our S.W. coasts. The depression over Scandinavia soon moved away ; but on the day following another disturbance appeared off our N.W. coast : the bar. rose over Scandinavia and Denmark, and at some English stations, whilst in all other parts of W. Europe it fell. At 8 a.m. on 12th the depression had its centre (28·8 in.) near Christiansünd : in consequence, the bar. fell rapidly in Scandinavia, the change amounting to 0·67 in. at Christiansünd. The aria of highest readings (centre now decreased to 30·4 in.) was still shown over our S.W. coasts and the Bay of Biscay. There was no change in the general distribution of pressure during the next 24 hours. On the morning of the 13th the centre of the last-mentioned depression was over S. Sweden and part of Denmark ; and a fresh disturbance seemed to be approaching our S.W. coasts : hence while pressure increased over the N. half of our Islands, it decreased everywhere else. Readings were still highest over the Bay of Biscay.

Temp. continued to be above the average throughout our Islands, the excess being for the most part 5° or 6°. The absolute max. (58°) was recorded at Manchester and Marlborough. The lowest of the min. were, with two exceptions, registered on the 11th.

Rainfall less than the mean everywhere. Heaviest fall : 2·27 in. at Loch Sunart ; lightest : 0·01 in. at Hereford and St. Leonards.

The seven days following (14th–20th) were very dull and unsettled generally. Great quantities of snow fell in Scotland, and exceedingly heavy rain in S. and S.W. England.

The depresssion noticed as being over Denmark on 13th passed away in the course of the day, and the mercury rose quickly in Scandinavia and Denmark, whilst over our Islands and France the bar. fell rapidly. The weather became very unsettled in the course of the next 24 hours, owing to the passage across W. Europe of two disturbances, one being, at 8 a.m. on 16th, over S. Wales, the other over the North Sea between the English N.E. coast and the W. coast of Denmark. The bar. fell everywhere, except in Scotland, where it rose quickly. During the day following the depression over the North Sea disappeared over N. Germany, whilst that over S. Wales moved to the N.W. of France : the bar. consequently rose in nearly all parts of W. Europe. On the next day the distribution of pressure underwent a peculiar and sudden change. Over France and Scandinavia the mercury rose, whilst the area of high pressure, which was over the more N. parts of our Islands, gave way, and was succeeded by a deep depression that advanced to our N.W. coasts, causing the bar. to fall 0·77 in. over N. Ireland. By 8 a.m. on 19th the centre (28·6 in.) was between Stornoway and Aberdeen. In consequence, the bar. fell quickly over the North Sea and Scotland ; but continued to rise briskly over Sweden and France. The chart of the 20th showed the centre to be over S. Norway, so that the bar. now fell in Sweden as well as in Norway : in the rear of the depression pressure began fast to recover, whilst over France and S. England the bar. fell somewhat, this latter decrease being caused by a number of small disturbances over the English Channel. These depressions soon moved away, and then the bar. rose over the whole of W. Europe.

Temp. rather more than the average in S. and S.W. England ; but in all other districts readings were much lower : in Scotland the deficit ranged from 6° to 8°. The ther. was mostly lowest on the 17th, when it fell to 15° at Glenalmond, 16° at Glasgow, 19° at Shrewsbury, 20° at Markree Castle and

Durham, and to between 23° and 30° elsewhere, except in the S. and S.W. The max. were generally rather low, the highest reading registered being 55° at Valentia.

Rainfall less than the mean in all districts, save E. and N.E. England: in S. and S.W. England the excess was very large, amounting to 2·77 in. at Falmouth, and 2·44 at St. Leonards. Lightest fall: 0·25 in. at Spurn Head.

Bright sunshine was more plentiful, except over central, E. and S. England, where the number of hours recorded was very small indeed. Max. duration: 18 hours at Douglas, Armagh and Dublin; min. duration: 1 hour at Falmouth.

The weather during the succeeding week (21st–27th) was generally dull and unsettled, with heavy falls of snow in Scotland, much rain, and some snow or sleet over England and Ireland. On the 25th the sky was comparatively clear, and continued so in S.E. England on 26th.

A depression, which was advancing towards our W. coasts on the 22nd, suddenly changed its course, having its centre on the morning of the 23rd over the Hebrides: from this point it passed E. ward suddenly during the night (23rd–24th) until on the following morning it was over the North Sea between Scotland and Denmark: the bar. consequently fell quickly over the whole of France, all our more S., E. and N. districts, and on the E. shores of the North Sea; but on our W. coast a brisk recovery of pressure began. The centre of the disturbance was shown over Denmark on the chart of the 25th, and near Stockholm on that of the 26th. In the course of the night (26–27th) a small depression (29·2) advanced from the Atlantic to S. Wales, occasioning a fall of 0·54 inch at Pembroke, and a brisk fall in most parts of our Islands. In all other parts of W. Europe pressure increased.

Temp. was about the average in S. and S.W. England; below it in all other districts: in E. Scotland the deficit was as much as 8°, and in N. Ireland 6°. The max. took place generally on the 23rd, the ther. rising to 54° or 55° over the greater part of England and S. Ireland. The min. occurred on 27th, when a reading of 14° was recorded at Aberdeen, and 23° or 24° over the greater part of England and Ireland. The absolute min. was 10° at Wick.

Rainfall much more than the mean everywhere, the excess being very large in the western parts of England. Heaviest fall: 3·33 in. at Manchester; lightest fall: 0·73 in. at Strathfield Turgiss and Silloth.

Bright sunshine showed an increase in most places. Max. duration: 21 hours at Durham; min. duration: 2 hours at Falmouth.

The 28th and two following days were generally dull and unsettled: the 31st was, however, moderately fine. Temp. was about the average, except in E. Scotland and in Ireland, where it was 3° or 4° below it. Rainfall was below the average, except in N. and S.W. England, where there was an excess. Bright sunshine was very deficient everywhere.

On the 28th a small, but well-marked, depression (29·2 in.) advanced to the extreme S.W. of England, causing a brisk decrease of pressure in the S.W., and a fall over all W. Europe. During the 29th and night following, this disturbance travelled N.E. ward to the neighbourhood of Skudesnäes, at the same time growing much deeper, the reading at the centre now being 28·8 in. Over England a shallow subsidiary was shewn. During the night (30th–31st) the main disturbance passed on in a N.E. direction towards central Scandinavia, whilst the subsidiary travelled away E. ward to N. Germany. The bar. then began to rise over the whole of W. Europe—briskly so in Scandinavia, France, and S.W. England.

Lowestoft. H. E. M.

END OF VOL XV.