

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Dalkeith, Leith, County of Midlothian, in Lat. _____, Long. _____, Height above Sea 183 feet.
Distance from Sea 3 miles. During the MONTH of January 1859.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUD.	SUNSHINE.	THERMOMETERS. under Ground.			SEA.		ELECTRICITY.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which these began and ended.	Days of Month.	
	9 h. A.M.		6 h. P.M.		PROTECTED.		EXPOSED.		9 h. A.M.		6 h. P.M.		9 h. A.M.		6 h. P.M.		Days on which it fell.	Amount.			h. A.M.			Temperature.	Density.				OZONE.
	Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Highest in Air.	Lowest in Air.	Max. Black bulb in Sun.	Min. Black bulb during Night.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.					3 inches.	12 inches.	22 inches.						
1	30.44	43	30.12	43	41.8	3.7			44	42	44	43	S.W.	1.5												Partly cloudy with fine rain in the evening.	1		
2	30.37	43	30.39	44	41.6	3.4			43	41	46	45	S.W.	1.5												Partly cloudy with fine rain in the evening.	2		
3	30.33	43	30.28	44	41.3	3.3			43	40	45	43	S.W.	1.5												Partly cloudy with fine rain in the evening.	3		
4	30.30	43	30.49	46	41.8	3.8			43	42	45	43	S.W.	1.5												Partly cloudy with fine rain in the evening.	4		
5	30.20	46	30.18	46	41.6	3.7			39	37	41	39	S.W.	1.5												Partly cloudy with fine rain in the evening.	5		
6	30.20	46	30.18	46	41.6	3.7			39	38	36	35	S.W.	1.5												Partly cloudy with fine rain in the evening.	6		
7	30.39	41	30.52	40	34	2.9			32	31	34	32	S.W.	1.5												Partly cloudy with fine rain in the evening.	7		
8	30.49	38	30.46	39	34	2.6			31	31	33	31	S.W.	1.5												Partly cloudy with fine rain in the evening.	8		
9	30.30	39	30.35	41	41.3	3.0			36	34	40	39	S.W.	1.5												Partly cloudy with fine rain in the evening.	9		
10	31.27	42	30.13	44	41.8	3.5			43	40	46	44	S.W.	1.5												Partly cloudy with fine rain in the evening.	10		
11	29.97	46	30.57	47	41.8	3.8			47	44	45	41	S.W.	1.5												Partly cloudy with fine rain in the evening.	11		
12	30.10	45	30.24	47	41.4	3.7			43	41	40	40	S.W.	1.5												Partly cloudy with fine rain in the evening.	12		
13	30.57	45	30.37	44	41.0	3.6			38	37	33	32	S.W.	1.5												Partly cloudy with fine rain in the evening.	13		
14	30.33	41	30.15	42	39	3.4			33	31	33	37	S.W.	1.5												Partly cloudy with fine rain in the evening.	14		
15	29.98	40	29.79	47	41	3.0			37	35	40	39	S.W.	1.5												Partly cloudy with fine rain in the evening.	15		
16	29.55	43	29.59	43	41.3	3.7			41	39	39	37	S.W.	1.5												Partly cloudy with fine rain in the evening.	16		
17	29.33	42	29.30	42	41.1	3.6			39	37	37	38	S.W.	1.5												Partly cloudy with fine rain in the evening.	17		
18	29.50	47	29.24	47	41.7	3.9			37	37	47	45	S.W.	1.5												Partly cloudy with fine rain in the evening.	18		
19	29.30	44	29.72	43	39	3.4			37	36	36	35	S.W.	1.5												Partly cloudy with fine rain in the evening.	19		
20	29.53	43	29.49	46	41	3.3			47	44	48	46	S.W.	1.5												Partly cloudy with fine rain in the evening.	20		
21	29.63	47	29.29	47	41.7	3.2			44	43	49	48	S.W.	1.5												Partly cloudy with fine rain in the evening.	21		
22	29.48	47	29.49	45	39	3.6			39	37	36	35	S.W.	1.5												Partly cloudy with fine rain in the evening.	22		
23	28.77	44	28.49	44	41.3	3			43	43	37	35	S.W.	1.5												Partly cloudy with fine rain in the evening.	23		
24	29.10	41	29.33	42	41.6	3.4			39	37	44	41	S.W.	1.5												Partly cloudy with fine rain in the evening.	24		
25	29.20	46	29.15	44	41.3	3.9			48	45	49	46	S.W.	1.5												Partly cloudy with fine rain in the evening.	25		
26	29.01	41	29.13	41	39	3.1			37	37	36	36	S.W.	1.5												Partly cloudy with fine rain in the evening.	26		
27	29.18	40	29.20	40	41.6	3.2			33	33	36	35	S.W.	1.5												Partly cloudy with fine rain in the evening.	27		
28	29.49	39	29.35	40	41	3.2			37	35	39	38	S.W.	1.5												Partly cloudy with fine rain in the evening.	28		
29	29.21	41	28.73	40	41.2	3.5			40	39	39	38	S.W.	1.5												Partly cloudy with fine rain in the evening.	29		
30	28.97	40	28.78	47	36	2.4			24	23	33	32	S.W.	1.5												Partly cloudy with fine rain in the evening.	30		
31	29.00	37	28.50	39	39	3.0			33	31	31	31	S.W.	1.5												Partly cloudy with fine rain in the evening.	31		
Suns.	58	92.56	104.8						511.83	1257	1196																		
Means.	64.27	29.75	43.64	33.8					39.8	38.2	40.3	.6																	
Index Errors.	4	2	2	2	2	2																							
Correction for Diurnal Range.																													
Corrected Means.	29.726	42.7	29.755	43.6	43.4	33.8																							
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27		

Barometer, mean corrected reading of Column No. 1 (A.M.), = 29.726 Column No. 3 (P.M.), = 29.755
Diameter of tube _____ inch; correction for capillarity to be added, + 0.060 Capillarity, = + 0.060
Sum, 29.786 Sum, 29.815
Correction for Temperature from Column No. 2 to be deducted, = - 0.037 Temp. from Col. 4, = - 0.040
Sum, 29.749 Sum, 29.775

Mean of the above 29.749
Correction for Height above Sea-level, 183 feet, to add, 0.208
Barometer corrected and reduced to 32° and Sea-level, 29.957

Dry bulb Thermometer (mean of Cols. 9 and 11), 40.0 39.8
Wet bulb Thermometer (mean of Cols. 10 and 12), 38.4 38.2
† Dew-point Temperature, 36.3 36.1
† Elastic Force of Vapour, 2.45 2.05
† Weight of Vapour in a Cubic Foot of Air, 2.48 2.48
† Additional Weight required to Saturate a Cubic Foot,
† Degree of Humidity (Saturation 100), 87 87.2

†† In the above columns for the registration of the Force of the Wind, may be entered the number of revolutions, by Professor Robinson's Cup Wind Gauge, which registers the velocity of the Wind—360 revolutions being equal to one statute mile.
* If the readings are taken at 9^h and 3^h, the 9^h readings to be alone taken to account, as the correction for Diurnal Range in Scotland is unknown.
† All these calculated from Glaisher's Hygrometric Tables, Second Edition only.
‡ The Diurnal Range for Scotland is as yet unknown.

N.B.—This Schedule should be returned (post-paid) as early as possible after the completion

Barometer, Highest observed reading of Month, = 30.52 on the 8th
Lowest do. do. = 28.72 on the 19th
Difference, or Monthly Range, = 1.800

SUMMARY OF THE WINDS.											
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	✓	✓	✓	✓	✓	✓	✓	✓			
P.M.	✓	✓	✓	✓	✓	✓	✓	✓			
Mean.	✓	✓	✓	✓	✓	✓	✓	✓			

Highest Reading Self-Registering Thermometer in Air and Protected, 53.0 on the 21st
Lowest do. do. do. 26.0 on the 8th
Difference, being Monthly Range, 27.0
Mean of Self-Registering Thermometers in Air and Protected, 38.6
Mean Daily Range in Air and Protected, 9.6
Greatest Daily Range, do., 21 on the 21st
Highest Reading Self-Registering Black Bulb Thermometer in Sun,
Lowest do. do. from Radiation during Night, on the

(Signed) W. Thomson
(Designation) Gardener

thly added, and the Means deduced. No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.

INSTRUCTIONS FOR MAKING METEOROLOGICAL OBSERVATIONS.

Those persons who kindly furnish Monthly Tables of the weather to the Scottish Meteorological Society are requested to attend to the following Instructions, seeing that one of the most important ends of Meteorological Observations is their being comparable with one another; and for this purpose it is requisite that all should, if possible, observe at a like hour, and in a like manner, and have their instruments placed, in so far as circumstances allow, in a like position:

Hour of Observation.—All instruments which are observed twice a-day should be read at the same hour morning and evening, in order to furnish mean results. The Society recommends a *quarter before nine o'clock morning and evening*, as the most convenient hour; but should this be inconvenient for the observer, another hour may be chosen, attending, however, to the above rule, that the evening and morning readings be taken at the same hour, and this hour entered on the Schedule.

Barometer.—Barometers of Messrs. Aile and Son's construction are recommended; but any instruments may be used which have adjustable surfaces, and have been compared. Before this instrument is suspended for use it should be examined in order to ascertain whether the space above the mercury is free from air. This is done by inclining the instrument somewhat from the vertical position, when, if free from air, the mercury will strike against the upper end of the tube with a sharp tap. The mercury should then completely fill the tube. If any air has got admittance, it should be driven into the cistern by reversing the instrument, and tapping it gently with the hand. If it cannot be thus expelled, the instrument is useless till repaired.

The barometer should be hung in a good light, and perfectly perpendicular, as ascertained by the plumb line; and it ought always to be gently tapped before taking the reading, to prevent adhesion of the mercury to the tube. In reading, the eye ought to be placed on the exact level of the top of the column of mercury. The reading of the attached thermometer ought always to be the first taken, as the heat of the breath or the proximity of the person, are apt to influence its readings.

The corrections necessary to be applied to the barometric readings depend on the form of the instrument. The mode of making these corrections, and the tables employed for the purpose, will be found in the "Report of the Committee of the Royal Society on Physics and Meteorology," 1840, price 1s. The daily readings of the barometer ought to be entered on the Schedule as read off, and the corrections only applied to the mean for the month.

Self-Registering Thermometers and Hygrometers.—These should be placed alongside of each other, in a place freely exposed to the air, but protected from sunbaking, and from reflected heat, as well as from radiation and from rain, and as near as may be *four feet* from the general surface of the ground. Different contrivances are used for this purpose, either a double ventilated box with louvre-boarded sides, fixed at a north window, and projecting 12 inches from the box and the wall; or in a double meat-safe ventilated box with louvre-boarded sides, fixed in an exposed place, and if possible over grass. Whatever means are finally decided on, the position of the instruments should be mentioned, and should not be changed (without due notice being given to the Secretary), in order that the results of one month's observations may be strictly comparable with those of another.

The **Self-Registering Thermometers** should be placed exactly horizontal. In the case of the ordinary maximum thermometer, with clay glass, or steel index, the bulb may be *very slightly* elevated, in order that the mercurial column may be somewhat aided by the force of gravity in pushing forward the foot or index; and in the case of the **minimum thermometer**, the bulb must be slightly depressed, to prevent a draining of the spirit to the top of the tube, and also that any part raised in vapour may return to the column. These thermometers, if read once a-day, should *always be read on the evenings*, so that the temperatures marked by the foot indicate the minimum and the maximum of the day on which the reading is taken. N.B.—The readings of these instruments are taken from that extremity of the foot which is nearest the *head of the column of mercury or of spirit*.

The **maximum Registering Thermometer**, for taking the extreme heat of the sun's rays, should have its bulb blackened and the surface rendered dull, and it should be mounted in a blackened box, whose sides should be so high as to protect the bulb from wind. It should be so placed that the sun's rays have free access to it during the heat of the day.

The **minimum Registering Thermometer**, for ascertaining the lowest temperature during the night from radiation, should have its bulb similarly blackened and rendered dull, and be similarly mounted. It should be laid out, about sunset, over grass, in a place freely exposed to the sky, but raised on wooden supports a few inches above the surface, and removed during the day.

Hygrometer.—The wet bulb requires the muslin covering it to be often changed. In towns once a month, or oftener, if the weather is dusty, and the muslin gets foul; in the country whenever the muslin seems to be foul. The muslin should always be thoroughly wetted and freed from starchy, before being used; and the cotton wick which conducts moisture to it should be thoroughly wetted, else it will conduct the moisture imperfectly, and yield false results. The cotton wick is best attached by passing its extremity through an aperture in the centre of the muslin, spreading that portion out so as to apply equally round the bulb, and then tying the muslin over the bulb. In frosty weather, water must be poured over the wet bulb, so as to form a thin film of ice on the muslin, the evaporation from the ice going on as from the simply wetted bulb.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	First in Ripeness.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Broom,		Cherry,			House-Swallow,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Malac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,					Other Birds, naming them,		
Rhododendron Ponticum,							
Whin,							

FOREST TREES.	In Flower.	In Leaf.	Diverging of Leaves.	CROPS.	Sowing or above ground.	In Ear or raised.	First Cut
Alder,				Barley,			
Ash,				Bere or Bigg,			
Beech,				Oats,			
Birch,				Wheat,			
Elm,				Beans,			
Larch,				Peas,			
Lincoln,				Potatoes,			
Oak,				Turnips,			
Sycamore or Plane,				Rye Grass,			

Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection; whether any have suffered from blight, disease, etc. Whether Epizootic disease prevails among Cattle; and the Agricultural condition of the district generally.

To

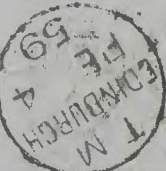
DR STARK,

Secy, Meteorological Society,

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EDINBURGH.

METEOROLOGICAL RETURNS.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Dalkeith Gardens, County of Midlothian, in Lat. 55°53', Long. 3°4', Height above Sea 183 feet.
Distance from Sea 3 miles. During the MONTH of February 1857.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUD.	SUNSHINE.	THERMOMETERS under Ground.			SEA.	OZONE.	ELECTRICITY.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which these began and ended.	Days of Month.	
	7 h. A.M.		6 h. P.M.		PROTECTED.		EXPOSED.		7 h. A.M.		6 h. P.M.		7 h. A.M.		6 h. P.M.		Days on which it fell.	Amount.			h. A.M.								
	Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Highest in Air.	Lowest in Air.	Max. Black bulb in Sun.	Min. Black bulb during Night.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force ↑↑.	Direction.	Force ↑↑.					3	12	22						
																					inches.	"	inches.						"
1	29.53	57	29.20	37	29.28				30	30	38	36	S.W.	1.5	S.W.												Thin overcast Showers at night.		
2	29.72	37	29.36	40	42	31			36	35	39	35	S.W.	1.5	S.W.												Cloudy windy and showery.		
3	29.71	36	29.20	30	37	26			30	30	32	32	S.W.	1.5	S.												Fine. Slight-hail showers.		
4	29.44	44	29.23	45	45	31			44	43	44	41	S.	1.5	S.												Passing clouds. Showers.		
5	29.10	41	29.15	41	39	32			35	36	36	34	S.W.	1.5	S.W.												Passing clouds. Fine and pleasant.		
6	29.01	41	29.00	41	37	32			36	35	34	34	S.W.	1.5	S.W.												Overcast - Small rain. Showers.		
7	28.99	39	29.01	39	36	29			33	33	32	31	S.W.	1.5	S.W.												Overcast - Light showers. Pleasant.		
8	29.19	37	29.20	38	38	26			32	30	36	35	S.	1.5	S.W.												Overcast - Small rain. Showers.		
9	29.05	39	28.90	41	44	35			40	39	42	40	S.	1.5	S.W.												Overcast - Light showers. Pleasant.		
10	29.03	40	29.03	41	43	33			38	37	40	38	S.W.	1.5	S.W.												Overcast - Small rain. Showers.		
11	29.09	41	29.13	45	46	35			40	39	43	41	S.W.	1.5	S.												Overcast - Small rain. Showers.		
12	29.42	46	29.56	36	42	35			35	35	40	39	S.W.	1.5	S.W.												Cloudy and showery throughout.		
13	29.67	42	29.69	44	43	31			36	35	42	40	S.W.	1.5	S.W.												Overcast - Cloudy and showery.		
14	29.52	43	29.40	42	41	35			40	39	37	35	S.W.	1.5	S.W.												Spiky. Fine and mild. Dense fog.		
15	29.47	45	29.38	51	51	32			48	46	49	48	S.W.	1.5	S.W.												Overcast throughout - Rain at night.		
16	29.40	50	29.43	49	53	48			50	49	49	47	S.W.	1.5	S.W.												Showers. Overcast - Fine and pleasant.		
17	29.63	46	29.60	46	44	36			43	40	41	38	S.W.	1.5	S.W.												Cloudy and showery squalls as in.		
18	29.81	41	30.00	44	41	31			35	33	37	35	S.W.	1.5	S.W.												Overcast - Rain. Fine and pleasant.		
19	30.04	41	30.01	43	40	33			38	37	36	35	S.W.	1.5	S.W.												Overcast - Windy. Occasional rain.		
20	29.99	42	29.97	40	53	43			45	43	46	43	S.W.	1.5	S.W.												Overcast - Fine. Passing showers.		
21	29.74	43	29.72	46	52	42			45	42	46	44	S.W.	1.5	S.W.												Heavy rain. Cloudy and disagreeable.		
22	29.89	40	30.04	48	47	36			43	41	40	36	S.W.	1.5	S.W.												Fine pleasant day throughout.		
23	30.32	43	30.34	46	49	32			41	38	45	43	S.W.	1.5	S.W.												Passing clouds. Dense fog.		
24	30.05	46	30.00	48	51	40			46	44	45	43	S.W.	1.5	S.W.												Cloudy and showery. A. Borealis.		
25	29.73	45	29.84	47	53	40			46	44	48	45	S.W.	1.5	S.W.												Cloudy and windy. A. Borealis.		
26	29.69	47	29.23	48	49	41			43	41	42	39	S.W.	1.5	S.W.												Passing clouds with fine intervals.		
27	29.65	46	29.74	48	50	35			43	40	41	39	S.W.	1.5	S.W.												Dark heavy clouds. Rain at night.		
28	29.75	43	29.73	45	51	32			41	39	40	43	S.W.	1.5	S.												Content - rain. Showers. A. Borealis.		
29	29.80	43	29.91	45	49	36			41	35	42	40	S.	1.5	S.												Passing clouds but fine.		
30																											Overcast - Fine. Passing clouds.		
31																											Passing clouds but fine.		
Sums.	867.12	1354	856.77	1279	1304	963			1157	1114	1191	1109																	
Means.	29.550	42.5	29.556	44.1	44.1	34.3			40.036	38.9				1.2															
Index Errors.	29.71	43.5	29.54	44.5	45.5	12.3			39.05	38.1	41.5	38.7																	
Correction for Diurnal Range.																													
Corrected Means.																													
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27		

Barometer, mean corrected reading of Column No. 1 (A.M.), = 29.550 Column No. 3 (P.M.), = 29.550
Diameter of tube _____ inch; correction for capillarity to be added, + .060 Capillarity, _____ = + .060
Sum, _____ = 29.610 Sum, _____ = 29.610
Correction for Temperature from Column No. 2 to be deducted, _____ = -.027 Temp. from Col. 4, _____ = -.027
Sum, _____ = 29.573 Sum, _____ = 29.573

Mean of the above _____ = 29.573
Correction for Height above Sea-level, _____ feet, to add, _____ = 2.10
Barometer corrected and reduced to 32° and Sea-level, _____ = 29.783

Dry bulb Thermometer (mean of Cols. 9 and 11),* _____ = 40.0
Wet bulb Thermometer (mean of Cols. 10 and 12),* _____ = 38.6
† Dew-point Temperature, _____ = 36.3
† Elastic Force of Vapour, _____ = .215
† Weight of Vapour in a Cubic Foot of Air, _____ = .213
† Additional Weight required to Saturate a Cubic Foot, _____ = .08
† Degree of Humidity (Saturation 100), _____ = 86

* In the above columns for the registration of the Force of the Wind, may be entered the number of revolutions, by Professor Robinson's Cup.
† If the readings are taken at 9° and 3°, the 3° readings to be alone taken to account, as the correction for Diurnal Range in Scotland is unknown.
‡ All these calculated from Glaisher's Hygrometric Tables, Second Edition only.
§ The Diurnal Range for Scotland is as yet unknown.

Barometer, Highest observed reading of Month, _____ = 30.32 on the 23rd
Lowest do. do. _____ = 28.90 on the 7th
Difference, or Monthly Range, _____ = 1.42

SUMMARY OF THE WINDS.												Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
Direction.	N	NE	E	SE	S	SW	W	NW	W	SW	NW			
A.M.	0	0	0	0	4	15	8	1						
P.M.	0	0	1	2	4	15	4	2						
Mean.	0	0	0	1	4	15	6	2						

Highest Reading Self-Registering Thermometer in Air and Protected, _____ = 53 on the 20th
Lowest do. do. do. _____ = 26 on the 3rd
Difference, being Monthly Range, _____ = 27
Mean of Self-Registering Thermometers in Air and Protected, _____ = 39.2
Mean Daily Range in Air and Protected, _____ = 9.8
Greatest Daily Range, do., _____ = _____ on the _____
Highest Reading Self-Registering Black Bulb Thermometer in Sun, _____ = _____ on the _____
Lowest do. do. from Radiation during Night, _____ = _____ on the _____

(Signed) W. Thomson
(Designation) General

EDINBURGH
A.D. 1890
P. 4

Dr. Stark, Glasgow
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EDINBURGH.

METEOROLOGICAL RETURNS.

SHRUBS, ETC.		FRUITS.		MIGRATORY BIRDS.	
First in	Blossom.	First in	Blossom.	First in	Departure.
Barberry,		Apple,		Cuckoo,	
Burtree or Elder,		Black Currant,		Curlew,	
Broom,		Cherry,		House-Swallow,	
Hazel,		Cean,		Lapwing,	
Hawthorn,		Gooseberry,		Plover,	
Holly,		Peach,		Sand-Martin,	
Laburnum,		Pear,		Starling,	
Lilac,		Plum,		Swan,	
Mazereon,		Strawberry,		Rail or Corn Crane,	
Mountain Ash or Rowan,				Other Birds, naming them—	
Red Flowering Currant,					
Rhododendron Ponticum,					
Whin,					

Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection; whether any have suffered from blight, disease, etc. Whether Epizootic disease prevails among Cattle; and the Agricultural condition of the district generally.

FOREST TREES.		CROPS.		MIGRATORY BIRDS.	
In	First in	First in	Departure.	First in	Departure.
Alder,		Barley,		Cuckoo,	
Ash,		Bare or Bigg,		Curlew,	
Beech,		Oats,		House-Swallow,	
Birch,		Wheat,		Lapwing,	
Elm,		Beans,		Plover,	
Larch,		Pease,		Sand-Martin,	
Lime,		Potatoes,		Starling,	
Oak,		Rye Grass,		Swan,	
Sycamore or Plane,				Rail or Corn Crane,	

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

INSTRUCTIONS FOR MAKING METEOROLOGICAL OBSERVATIONS.

Persons who kindly furnish Monthly Tables of the Weather to the Scottish Meteorological Society are requested to attend to the following instructions, giving that one of the most important ends of Meteorological Observations is their being comparable with one another, and for this purpose it is requisite that all should, if possible, observe at the same hour, and in the same manner, and have their instruments placed, in so far as circumstances allow, in a like position.

Hour of Observation.—All instruments which are observed twice a day, should be read at the same hour morning and evening, in order to furnish many results. The Society recommends a quarter before nine o'clock, morning and evening, as the most convenient hour; but should this be inconvenient, for the observer, another hour may be chosen, attending, however, to the above rule, that the evening and morning readings be taken at the same hour, and this hour entered on the Schedule.

Barometer.—Barometers of Messrs. Aile and Son's construction are recommended; but any instruments may be used which have adjustable surfaces, and have been compared. Before this instrument is suspended for use it should be examined, in order to ascertain whether the space above the mercury is free from air. This is done by inclining the instrument somewhat from the vertical position, when, if free from air, the mercury will strike against the upper end of the tube with a sharp tap. The mercury should then completely fill the tube. If any air has not subsided, it should be driven into the cistern by reversing the instrument, and tapping it gently with the hand. If it cannot be thus expelled, the instrument is useless and will require repair.

The barometer should be hung in a good light, and perfectly perpendicular, as ascertained by the plumb line; and it ought always to be gently tapped before taking the reading, to prevent adhesion of the mercury to the tube. In reading the eye ought to be placed on the exact level of the top of the column of mercury. The reading of the attached thermometer ought always to be the first taken, as the heat of the breath, or the proximity of the person, are apt to influence its readings.

The corrections necessary to be applied to the barometric readings depend on the form of the instrument. The mode of making these corrections, and the tables employed for the purpose, will be found in the "Report of the Committee of the Royal Society on Physics and Meteorology," 1840, price 1s. The daily readings of the barometer ought to be entered on the Schedule as read off, and the corrections only applied to the mean for the month.

Self-Registering Thermometers and Hygrometers.—These should be placed alongside of each other, in a place freely exposed to the air, but protected from sunshine, and from reflected heat, as well as from radiation and from rain, and as near as may be far from the general surface of the ground. Different contrivances are used for this purpose, either a double ventilated box with louver-boarded sides, fixed at a north window, and projecting 12 inches from the wall, so as to allow a free current of air to pass between the box and the wall; or in a double meat-safe ventilated box with louver-boarded sides, fixed in an exposed place, and if possible over grass. Whatever means are finally decided on, the position of the instruments should be mentioned, and should not be changed (without the notice being given to the Secretary) in order that the results of one month's observations may be strictly comparable with those of another.

The Self-Registering Thermometers should be placed exactly horizontal. In the case of the ordinary maximum thermometer, with clay, glass, or steel index, the bulb may be very slightly elevated, in order that the mercurial column may be somewhat aided by the force of gravity in pushing forward the float or index; and in the case of the minimum thermometer, the bulb must be slightly depressed, to prevent a draining of the spirit to the top of the tube, and also that any part raised in vapour may return to the column. These thermometers, if read once a-day, should always be read on the evening, so that the temperatures marked by the floats indicate the minimum and the maximum of the day on which the reading is taken. N.B.—The readings of these instruments are taken from that extremity of the float which is nearest the head of the column of mercury or of spirit.

The maximum Registering Thermometer.—For taking the extreme heat of the sun's rays, should have its bulb blackened and the surface rendered dull, and it should be mounted in a blackened box, whose sides should be so high as to protect the bulb from wind. It should be so placed that the sun's rays have free access to it during the heat of the day.

The minimum Registering Thermometer.—For ascertaining the lowest temperature during the night from radiation, should have its bulb similarly blackened and rendered dull, and be similarly mounted. It should be laid out, about sunset, over grass, in a place freely exposed to the sky, but raised on wooden supports a few inches above the surface, and removed during the day.

Hygrometer.—The wet bulb requires the muslin covering it to be often changed. In towns once a month, or oftener if the weather is dusty, and the muslin gets foul; in the country whenever the muslin seems to be foul. The muslin should always be thoroughly wetted, and freed from starch, before being used; and the cotton wick which conducts moisture to it should be thoroughly wetted, else it will conduct the moisture imperfectly, and yield false results. The cotton wick is best attached by passing its extremity through an aperture in the centre of the muslin, spreading that portion out so as to apply gently round the bulb, and then tying the muslin over the bulb. In frosty weather, water must be poured over the wet bulb, so as to form a thin film of ice on the muslin, the evaporation from the ice going on as from the simply wetted bulb.

Rain Gauge.—As "Plumbing's Rain Gauge" seems to possess several advantages over others, the Society gives the preference to them; but whatever form be employed, in order that all the readings may yield comparable results, it is recommended that the Gauge be sunk in the ground, so that the top of the receiver is nearly on a level with the top blades of close cut grass, in a place as distant as possible from trees, houses, high walls, and irregular or broken ground, and the quantity of Rain, should, if possible, be registered daily. When more than one Rain Gauge is kept, they ought to be placed near each other, but at different heights above the ground, and their indications noted in the general remarks, mentioning their height above ground—the regular column in the Schedule being reserved for the ground Rain Gauge alone.

Winds.—Ascribed Wind-vanes or Weather-cocks are apt to give false indications of the general direction of the wind, in consequence of the currents of air at the surface of the ground being so much influenced by the neighbourhood of hills, valleys, buildings, etc. Where low clouds are seen drifting along, their direction in reference to known objects, or as noted by means of a mirror fixed over the centre of a pocket compass with a circular surface if these clouds are near and immediately over head, and is in or near the zenith of the observer. The motion of the higher strata of clouds gives no such indication. Finding the clouds, the general direction of the smoke of a chimney or village, or of a tall chimney, gives a better indication of the general direction of the wind than any wind-vane. The observer should state whether he has ascertained the direction by reflection or otherwise. For mode of estimating the force of the wind, see "Directions for Reading Instruments." Lind's Anemometer of moderate price yet invented is Professor Robinson's Cup Wind Gauge, which registers the velocity of the wind—540 revolutions of the cups, as registered by the instrument, being equal to one statute mile.

Clouds.—The Society recommends observers to adopt the Howard nomenclature of clouds. The scale of cloud in the visible sky is reckoned from 0 to 10. Thus, a sky quite free from cloud is 0; a sky half covered with cloud is 5; and the whole visible sky covered with cloud is 10. Clouds often cover the sun, so that the indications noted in the column for clouds would not necessarily express, or agree with, the column for sunshine. As the full moon, so long as it is above the horizon, is thought by some eminent astronomers to have a powerful effect in dispelling clouds, it would be well to note in the General Remarks any facts bearing on this point, for a few days (or nights, as the case may be) before and after every full moon; and the same observations ought to be made at the periods of new moon.

Sunshine.—The number of hours the sun shines during the day should be entered in the proper column.

Thermometers under Ground.—Though the temperature and hygrometric conditions of the air are those which chiefly influence the growth of crops, it is important for the health of the crop, and for the germination of the seed, that the soil itself should have a certain temperature. To collect facts which may illustrate this, it is recommended to have Thermometers sunk 3, 12, and 22 inches below the surface of the ground, to ascertain the temperature of what may be termed the agricultural soil; and the observer should enter in this Schedule the kind of soil; whether drained or undrained; and whether naturally wet or dry.

Temperature of the Sea.—As the meteorology of the island is incomplete without a knowledge of the mean temperature of the Ocean which surrounds it, the Society strongly recommends taking the temperature of the Sea at a depth of 6 feet or 1 fathom from the end of all piers or rocks round the coast, where, free from the influence of river-water, and as near as may be about the time of high water. A thermometer, with its bulb fixed in a small tin pichet, covered with a sloping lid, and with a weight attached, is sent to the required depth, and in ten minutes drawn up and read. The density of the sea water should, if possible, be taken at the same time. Convenient instruments are furnished by Messrs. Aile and Son.

Temperature of Springs.—The temperature of Springs or Deep Wells is recommended to be taken whenever practically, mentioning whether Spring or Well, and its depth from the surface. *Notations, Averse Boreas, Remarkable Depression or Elevation of Barometer, Remarkable Falls of Rain, Hail or Snow, Thunder and Lightning, etc.* should be specially noticed, together with the exact hour at which they were first seen, their continuance, and direction.

Building, Leaking, and Flooding of Trees.—It is necessary to bear in mind that varieties of the same species of tree differ widely in their times of leafing and flowering. Individual Trees or Shrubs of each kind should therefore be chosen (if possible early kinds), and their indications should be alone noted—always the same plant from year to year being noted.

Ozone.—Mention whether Schönbein's or Moffet's scale and papers are used. Schönbein's are preferred. They may be had at Messrs. Aile and Son's, 50, Princes Street, and at Mr. Bryson's, 60, Princes Street, Edinburgh.

Electricity.—Thin balls suspended by a chain threaded in connection with a metallic conductor, and under cover, and the degrees of a circle being used to express the degree of repulsion, from a cheap and convenient Electrometer. Exact glass or sealing-wax ascendants the nature of the electricity.

SCOTTISH METEOROLOGICAL SOCIETY.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Dunblane, County of Fife, in Lat. 56° 22' N, Long. 3° 15' W, Height above Sea 183 feet.
Distance from Sea 3 miles. During the MONTH of April 1859.

Days of Month.		BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUD.	SUNSHINE.	THERMOMETERS under Ground.			SEA.	OZONE.	ELECTRICITY.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which these began and ended.	Days of Month.			
		9 h. A.M.		6 h. P.M.		PROTECTED.		EXPOSED.		7 h. A.M.		6 h. P.M.		7 h. A.M.		6 h. P.M.		Days on which it fell.	Amount.			h. A.M.										
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Highest in Air.	Lowest in Air.	Max. Black bulb in Sun.	Min. Black bulb during Night.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.					3 inches.	12 inches.	22 inches.								
																														0 to 10	A.M.	P.M.
1	29.74	38	29.33	42	40	26			39	36	40	39	SW		SW													Boisterous throughout.	1			
2	29.52	43	29.77	45	48	35			46	44	45	42	SW		SW														Cloudy and strong breeze from S.W.	2		
3	29.67	51	29.61	50	57	40			53	52	52	52	W		W														Dark heavy clouds passing.	3		
4	29.66	50	29.70	60	56	43			53	50	52	50	W		W														Cloudy but fine throughout.	4		
5	29.72	52	29.85	54	57	45			53	51	52	49	SW		SW															Exceedingly fine throughout.	5	
6	29.78	52	29.79	53	63	48			54	49	56	51	SW		SW															Remarkably fine throughout.	6	
7	29.68	55	29.60	59	68	46			59	53	56	52	W		W															Very fine. Exceedingly hot.	7	
8	29.45	56	29.33	59	56	46			55	50	52	51	SW		SW															Thin overcast. Cloudy and strong breeze from S.W.	8	
9	29.81	57	29.72	49	55	41			52	50	50	48	W		W															Thin overcast. Partly sunny.	9	
10	28.87	52	28.82	50	49	42			47	46	42	40	SE		SE															Heavy rain. Dark heavy clouds.	10	
11	28.78	45	29.17	45	43	32			39	37	44	37	W		W															Heavy rain. Dark heavy clouds.	11	
12	29.45	45	29.29	46	41	30			38	36	37	35	W		W															Heavy rain. Dark heavy clouds.	12	
13	29.27	42	29.29	44	42	31			38	36	37	35	W		W															Heavy rain. Dark heavy clouds.	13	
14	29.23	42	29.05	42	45	31			37	34	33	32	W		W															Heavy rain. Dark heavy clouds.	14	
15	29.10	41	29.23	42	43	28			40	37	35	35	SE		SE															Heavy rain. Dark heavy clouds.	15	
16	29.34	51	29.30	42	42	26			36	35	39	37	W		W															Heavy rain. Dark heavy clouds.	16	
17	29.63	40	29.67	42	42	28			42	37	39	34	W		W															Heavy rain. Dark heavy clouds.	17	
18	29.61	39	29.58	42	42	26			39	34	39	33	W		W															Heavy rain. Dark heavy clouds.	18	
19	29.47	39	29.40	45	43	30			38	36	38	35	W		W															Heavy rain. Dark heavy clouds.	19	
20	29.35	41	29.33	42	39	30			36	36	37	36	W		W															Heavy rain. Dark heavy clouds.	20	
21	29.37	39	29.40	42	43	37			37	35	39	37	W		W															Heavy rain. Dark heavy clouds.	21	
22	29.53	40	29.38	40	41	32			35	34	39	36	W		W															Heavy rain. Dark heavy clouds.	22	
23	29.69	40	29.77	43	46	34			40	37	43	38	SW		SW															Heavy rain. Dark heavy clouds.	23	
24	29.82	46	29.87	46	48	30			47	44	42	40	SW		SW															Heavy rain. Dark heavy clouds.	24	
25	29.88	47	29.77	46	46	38			43	42	39	38	SW		SW															Heavy rain. Dark heavy clouds.	25	
26	30.05	46	30.10	47	49	36			44	41	43	40	SW		SW															Heavy rain. Dark heavy clouds.	26	
27	30.11	44	30.22	47	46	38			43	42	42	40	SW		SW															Heavy rain. Dark heavy clouds.	27	
28	29.84	45	29.76	45	42	35			41	39	42	39	SW		SW															Heavy rain. Dark heavy clouds.	28	
29	29.48	46	29.83	47	48	36			45	42	44	41	SW		SW															Heavy rain. Dark heavy clouds.	29	
30	29.87	46	29.83	47	48	30			45	41	45	42	SW		SW															Heavy rain. Dark heavy clouds.	30	
31																															Heavy rain. Dark heavy clouds.	31
Sums.	1645	137	1620	144					1312	1231																						
Means.	29.548	43.8	29.72	46.4					43.7	41.6																						
Index Error.																																
Correction for Diurnal Range.																																
Corrected Means.																																
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27					

Barometer, mean corrected reading of Column No. 1 (A.M.), = 29.548 Column No. 3 (P.M.), = 29.72
Diameter of tube inch; correction for capillarity to be added, = 0.060 Capillarity, = 0.060
Sum, = 29.608 Sum, = 29.78
Correction for Temperature from Column No. 2 to be deducted, = 0.046 Temp. from Col. 4, = 0.046
Sum, = 29.562 Sum, = 29.734

Mean of the above = 29.562
Correction for Height above Sea-level, feet, to add, = 0.201

Barometer corrected and reduced to 32° and Sea-level, = 29.732

Dry bulb Thermometer (mean of Cols. 9 and 11), = 43.7
Wet bulb Thermometer (mean of Cols. 10 and 12), = 40.2
† Dew-point Temperature, = 37.8
† Elastic Force of Vapour, = 0.229
† Weight of Vapour in a Cubic Foot of Air, = 0.219
† Additional Weight required to Saturate a Cubic Foot, = 0.219
† Degree of Humidity (Saturation 100), = 79

† In the above columns for the registration of the Force of the Wind, may be entered the number of revolutions, by Professor Robinson's Cup
* If the readings are taken at 9° and 3°, the 9° readings to be alone taken to account, as the correction for Diurnal Range in Scotland is unknown.
† All these calculated from Glaisher's Hygrometric Tables, Second Edition only.
‡ The Diurnal Range for Scotland is as yet unknown.

N.B.—This Schedule should be returned (post-paid) as early as possible after the completion of the Month, with the Sums correctly added, and the Means deducted.

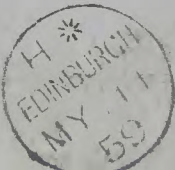
Barometer, Highest observed reading of Month, = 30.11 on the 27th
Lowest do. do., = 28.78 on the 11th
Difference, or Monthly Range, = 1.33

SUMMARY OF THE WINDS.										
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.	0	3	3	3	0	5	5	11		
P.M.	0	1	6	3	0	7	5	8		
Mean.	0	2	4	3	0	6	5	10		

Highest Reading Self-Registering Thermometer in Air and Protected, = 68 on the 7th
Lowest do. do., = 26 on the 11th
Difference, being Monthly Range, = 42
Mean of Self-Registering Thermometers in Air and Protected, = 41.4
Mean Daily Range in Air and Protected, = 13.2
Greatest Daily Range, do., = 12.9
Highest Reading Self-Registering Black Bulb Thermometer in Sun, = 22.0 on the 7th
Lowest do. do., = 19 on the 11th
from Radiation during Night, = 19 on the 11th

(Signed) W. Thomson
(Designation) Gardner

No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.



1868
MAY 11
PAID

To

DR STARK,

Sec., Meteorological Society,

21, Dundas Street,

EDINBURGH.

METEOROLOGICAL RETURNS.

Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection; whether any have suffered from blight, disease, etc. Whether Epizootic disease prevails among Cattle; and the Agricultural condition of the district generally.

SHRUBS, ETC.	FRUITS.	MIGRATORY BIRDS.	First Arrival.	First Departure.
Barberry,.....	Apple,.....	Cuckoo,.....		
Bourtree or Elder,.....	Black Currant,.....	Curlew,.....		
Broom,.....	Cherry,.....	House-Swallow,.....		
Hazel,.....	Gean,.....	Lapwing,.....		
Hawthorn,.....	Gooseberry,.....	Flower,.....		
Holly,.....	Peach,.....	Sand-Martin,.....		
Laburnum,.....	Pear,.....	Starling,.....		
Lilac,.....	Plum,.....	Swan,.....		
Mezerion,.....	Strawberry,.....	Rail or Corn Crake,.....		
Mountain Ash or Rowan,.....		Other Birds, naming them.....		
Red Flowering Currant,.....				
Rhododendron Ponticum,.....				
Whin,.....				

FOREST TREES.	Leaf Buds.	In Leaf.	Divided of Leaves.	CROPS.	Sowing or Planting.	Harvesting or Reaping.	First Cut.
Alder,.....				Barley,.....			
Ash,.....				Bare or Bigg,.....			
Beech,.....				Oats,.....			
Birch,.....				Wheat,.....			
Elm,.....				Beans,.....			
Larch,.....				Pease,.....			
Lime,.....				Potatoes,.....			
Oak,.....				Turnips,.....			
Sycamore or Plane,.....				Rye Grass,.....			

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Hygrometer.—The wet bulb requires the muslin covering it to be often changed. In towns once a month, or oftener, if the weather is dusty, and the muslin gets foul; in the country whenever the muslin seems to be foul. The muslin should always be thoroughly wetted, and freed from starch, before being used; and the cotton wick which conducts moisture to it should be thoroughly wetted, else it will conduct the moisture imperfectly, and yield false results. The cotton wick is best attached by passing its extremity through an aperture in the centre of the muslin, spreading that portion out so as to apply equally round the bulb, and then tying the muslin over the bulb. In frosty weather, water must be poured over the wet bulb, so as to form a thin film of ice on the muslin, the evaporation from the ice going on as from the simply wetted bulb.

Rain Gauge.—As "Fleming's Rain Gauge" seem to possess several advantages over others, the Society gives the preference to them; but whatever form be employed, in order that all the stations may yield comparable results, it is recommended that the Gauge be sunk in the ground, so that the top of the receiver is nearly on a level with the top blades of close cut grass, in a place as distant as possible from trees, houses, high walls, and irregular or broken ground, and the quantity of Rain should, if possible, be registered daily. When more than one Rain Gauge is kept, they ought to be placed near each other, but at different heights above the ground, and their indications noted in the general returns, mentioning their height above ground—the regular column in the Schedule being reserved for the ground Rain Gauge alone.

Winds.—Isolated Wind-vanes or Weather-cocks are apt to give false indications of the general direction of the wind, in consequence of the currents of air at the surface of the ground being so much influenced by the neighbourhood of hills, valleys, buildings, etc. Where low clouds are seen drifting along, their direction in reference to known objects, or as noted by means of a mirror on which a compass may be laid, or by means of a circular mirror fixed over the centre of a pocket compass, will, in general, give the true direction of the current of air near the earth's surface if these clouds are near and immediately over head, that is, in or near the zenith of the observer. The motion of the higher strata of clouds gives no such indication. Failing the clouds, the chimney gives a better indication of the general direction of the wind than any wind-vane. The observer should state whether he has ascertained the direction by reflection or otherwise. For mode of estimating the force of the wind, see "Directions for Reading Instruments." Lind's Anemometer of moderate price yet intended is Professor Robinson's Cup Wind Gauge which registers the velocity of the wind—540 revolutions of the cups, as registered by the instrument, being equal to one statute mile.

Clouds.—The Society recommends observers to adopt the Howard nomenclature of clouds. The scale of cloud in the visible sky is reckoned from 0 to 10. Thus, a sky quite free from cloud is 0; a sky half covered with cloud is 5; and the whole visible sky covered with cloud is 10. Clouds often cover three-fourths or even more of the visible sky without obstructing the sunshine, so that the indications noted in the column for clouds would not necessarily express, or agree with, the column for sunshine. As the full moon, so long as it is above the horizon, is thought by some eminent astronomers to have a powerful effect in dissipating clouds, it would be well to note in the General Remarks any facts bearing on this point, for a few days (on nights, as the case may be) before and after every full moon; and the same observations ought to be made at the periods of new moon.

Sunshine.—The number of hours the sun shines during the day should be entered in the proper column.

Thermometers under Ground.—Though the temperature and hygrometric conditions of the air are those which chiefly influence the growth of crops, it is important for the health of the crop, and for the germination of the seed, that the soil itself should have a certain temperature. To collect facts which may illustrate this, it is recommended to have Thermometers sunk 3, 12, and 22 inches below the surface of the ground, to ascertain the temperature of what may be termed the *agricultural soil*; whether drained or undrained; and whether naturally wet or dry.

Temperature of the Sea.—As the meteorology of the island is incomplete without a knowledge of the mean temperature of the Ocean which surrounds it, the Society strongly recommends taking the temperature of the Sea at a depth of 6 feet or 1 fathom from the end of all piers or rocks round the coast, where free from the influence of river water, and as near as may be about the time of high water. A Thermometer with its bulb fixed in a small tin pincely covered with a sloping lid and with a weight attached, is sunk to the required depth, and in ten minutes drawn up and read. The density of the sea water should, if possible, be taken at the same time. Convenient instruments are furnished by Messrs Adie and Son.

Temperature of Springs.—The temperature of Springs or Deep Wells is recommended to be taken whenever practicable, mentioning whether Spring or Well, and its depth from the surface. **Moons.** Aurora Borealis, Remarkable Depression or Elevation of Barometer, Remarkable Falls of Rain, Hail or Snow, Thunder and Lightning, etc., should be specially noticed, together with the exact hour at which they were first seen, their continuance, and direction.

Birding, Leafing, and Flowering of Trees.—It is necessary to bear in mind that varieties of the same species of tree often widely differ in their times of leafing and flowering. *Individual Trees or Shrubs* of every kind should therefore be chosen (if possible early kinds), and their indications should be alone noted—always the same plant from year to year being noticed.

Other.—Mention whether Schombert's or Moffat's scale and papers are used. Schombert's are preferred. They may be had at Messrs Adie and Son's, 30, Princes Street, and at Mr Bryson's, 60, Princes Street, Edinburgh. **Electricity.**—Pith balls suspended by a linen thread, in connection with a metallic conductor, and under cover, and the degree of a circle being used to express the degree of repulsion, form a cheap and convenient Electrometer. Excised glass or sealing-wax ascertains the nature of the electricity.

SCOTTISH METEOROLOGICAL SOCIETY.

[illegible]

FOREST TREES.	Alder,	Asb,	Beech,	Elm,	Larch,	Lim.,	Oak,	Sycamore or Plane, ..
In flower.								
In first appear.								
In leaf buds								
In leaf.								
Divested of leaves.								
CROPS mentioning variety.	Barley,	Bere or Bigg,	Oats,	Wheat,	Beans,	Pease,	Potatoes,	Turnips,
Sowing or planting.								
Appearing or above ground.								
In ear								
First Cut								
or flower, or raised.								

METEOROLOGICAL RETURNS.

DR STARK.

rological Society.

21, Rutland Street.

EDINBURGH

INSTRUCTIONS FOR MAKING METEOROLOGICAL OBSERVATIONS.

Hours of observation.—Arrangements when are observed twice a-day should be read at the same hour morning and evening, in order to furnish mean results. The Society recommends a *quarter before nine o'clock, morning and evening*, as the most convenient hour; but should this be inconvenient for the observer, any other hour may be chosen, attending however to the above rule, that the evening and morning readings be taken at the same hour; and this hour entered on the Schedule.

are recommended; but any instruments may be used which have reliable supports, and have been compared. Before this instrument is suspended, or use is should be examined, in order to ascertain whether the space above the mercury is free from air. This is done by inclining the instrument somewhat from the vertical position, when, if free from air, the mercury will settle against the upper end of the tube with a sharp tap. The mercury should then completely fill the tube. If any air has got admittance, it should be driven into the cistern by raising the instrument, and tapping it gently with the hand. If it cannot be thus expelled, the instrument is useless till repaired.

The Bismore should be hung in a good light and perpendicular, as ascertained by the plumb line; and it ought always to be gently tapped before taking the reading to prevent adhesion of the mercury to the tube. In reading, the eye ought to be placed on the exact level of the top of the column of mercury. The reading of the attached Thermometer ought always to be the first taken, as the heat of the breath, or the proximity of the person, are apt to influence its readings.

The corrections necessary to be applied to the Barometer readings depend on the form of the instrument. The mode of making these corrections, and the tables employed for the purposes, will be found in the "Report of the Committee of the Royal Society on Physics and Meteorology," 1850, page 18. The daily readings of the Barometer ought to be entered on the Schedule as *read off*, and the corrections only applied to the mean for the month. *Self-Registering Thermometers and Hygrometers*.—These should

The purpose of the enclosure, in a place freely exposed to the air, but protected from sunlight and from reflected heat, is to be as well as from radiation and from rain, and as near as may be *below level* from the general surface of the ground. Different contrivances are used for this purpose, either a double ventilated box with louver-boarded sides, fixed at a north window, and projecting 12 inches from the wall, so as to allow a free current of air to pass between the box and the wall; or, in a double meat-stall ventilated box with louver-boarded sides, fixed in an exposed place, and if possible over a stall. Whatever means are finally decided on, the position of the instruments should be mentioned, and should not be changed (without due notice being given to the Secretary) in order that the results of one month's observations may be strictly comparable with those of another.

The *Schizogasterium* Thelmoetensis should be placed exactly horizontal. In the case of the ordinary *maculatum* Thelmoetensis, with clay, glass, or steel index, the bulb may be very slightly elevated, in order that the mineral column may be somewhat affected by the force of gravity in pushing forward the float or index; and in the case of the *marginatum* Thelmoetensis, the bulb must be slightly depressed, to prevent a turning of the spirit to the top of the column, and also that any part rising in vapour may return to the column. These Thelmoetensis, if read once a-day, should *always be read on the outside*, so that the capriciousness marked by the floats indicates the minimum and the maximum of the day on which the reading is taken. N.B.—The readings of these instruments are taken from that extremity of the float which is nearest the *head of the column* of mercury or of spirit.

The maximum Registering Thermometer, by taking the extreme heat of the sun's rays, should have its bulb blackened and the surface rendered dull, and it should be mounted in a bracket box, whose sides should be so high as to protect the bulb from wind. It should be so placed that the sun's rays have free access to it during the heat of the day.

The *minima* respecting Liethornet, for ascertaining the lowest temperature during the night from radiation, should have its bulb similarly blackened and rendered dull, and be similarly mounted. It should be laid out, about sunset, over grass, in a place freely exposed to the sky, but raised on wooden supports a few inches above the surface, and removed during the day.

Hoopnoses. This wet bath requires the muslin covering, if it be often changed. In towns over a month or otherwise, if the weather is dusty, and the muslin gets foul, in the country, where the weather is generally clear, it may be changed once, whenever the muslin seems to be foul. The muslin should always be thoroughly wetted, and freed from moisture, before being used; and the cotton wick which conducts moisture to it should be thoroughly wetted also; it will conduct the moisture imperfectly, and yield false results. The cotton wick is best attached by passing its extremity through an aperture in the centre of the muslin, spreading that portion out so as to apply evenly round the bath, and then tying the muslin over the bath. In frosty weather, water must be poured over the wick, so as to form a thin film of ice on the muslin, the exposure to the air, and the cotton wick, and the simply wetted bath.

Light Rain—As "Flaming's Rain Gauge" seem to possess several advantages over others, the Society gives the preference to them if not otherwise form be employed, in order that all the stations may yield compatible results. It is recommended that the Gauge be sunk in the ground, so that the top of the receiver is nearly on a level with the top blades of *close cut grass*, in a place as distant as possible from trees, houses, high walls, and irregular or broken ground, and the quantity of *Rain*, should, if possible, be recorded daily. When more than one Rain Gauge is kept, they ought to be placed near each other, but at different heights above the ground, and their indications noted in the *general notes*, mentioning their height above ground—the regular column in the Schedule being reserved for the ground Rain Gauge.

147/1788.—*General Wind-rose or Weather-cocks* are apt to give the false indications of the general direction of the wind, in consequence of the currents of air at the surface of the globe, being so much influenced by the neighbourhood of hills, valleys, buildings, etc. Where low clouds are seen drifting across their direction in reference to known objects, or as noted by means of a mirror on which a compass may be laid, or by means of a circular mirror fixed over the centre of a pocket compass, with, in general, the needle pointing to the north, the current of air near the earth's surface if these clouds are near and immediately over head, that is, on or near the zenith of the observation. The motion of the higher strata of clouds gives no such indication. Failing the clouds, the general direction of the smoke of a hammer or village, or of a tall chimney, gives a better indication of the general direction of the wind than any wind-vane. The observer should likewise, for more accuracy, have accompanied the direction by a reflection of the same, by estimating the force of the wind, see "Directions for Reading Instruments." Lind's Anemometer is commonly used for this purpose, but the best Anemometer of moderate price yet for this purpose, is Professor Robinson's Cup Wind Gauge, which registers the velocity of the wind,—540 revolutions of the cups, as registered by its instrument, being equal to one statute mile.

Clouds—the Society recommends observers to adopt the Howard nomenclature of clouds. The scale of cloud in the visible sky is reduced from 0 to 10. Thus, a sky quite free from cloud is 0; a sky half covered with cloud is 5; and the maximum visible sky covered with cloud is 10. Clouds often cover three-fourths or even more of the visible sky without obstructing the sun, so that the indications noted in the column for clouds would not necessarily express, or agree with, the column for sunshine. As the full moon, *so long as it is above the horizon*, is always visible, the Society recommends that the column for moon be dropped by some eminent astronomers to have a powerful effect in simplifying them; it would be well to note in the General Remarks any cases bearing on this point, for a few days (or nights as they may be) before and after every full moon; and the same observations ought to be made at the periods of new moon.

Shadows.—The number of hours the sun shines during the day should be entered in the proper column.

Thermometer under ground.—Through the temperature and

physiometeorological conditions of the area those which chiefly influence the growth of crops. It is important for the health of the crop, and for the germination of the seed, that the soil itself should have a certain temperature. To collect facts which may illustrate this, it is recommended to have thermometers sunk 3, 12, and 22 inches below the surface of the ground, to ascertain the temperature of what may be termed the agricultural soil, and the temperature which enters in the Scheldt the *kinde* of soil; whether drained or undrained; and whether naturally wet or dry.

temperature of the Sea, — as the Meteorology of the island is incomplete without a knowledge of the mean temperature of the Ocean which surrounds it. The Society strongly recommends taking the temperature of the Sea at a depth of 6 feet or 1 fathom from the end of all piers or rocks round the coast, where free from the influence of river water, and as near as may be about the middle of high water. A Thermometer, with its bulb fixed in a small quantity of quicksilver, and with a weight attached, suspended to the required depth, and in calmness drawn up and read. The density of the sea water should, if possible, be taken at the

Temperature of Springs.—The temperature of Springs or Deep Wells is recommended to be taken whenever practicable, mentioning either Spring or Well, and its depth from the surface. *Meleors, Auvoua Boroids, Removable Depression or Elevation of Barometer, remarkable Falls of Heat, Heat or Snow, Thunder Storms, &c.*, should be especially noticed, together with the exact hour, and the day of the month, when the observation is made, at which they were first seen, their continuance, and duration. *Direction and Prevailing of Winds*.—It is necessary to

year in mind that varieties of the same species of tree differ widely in their times of leafing and flowering. *Individual Trees or Shrubs* of each kind should therefore be chosen (if possible early kinds), and their indications should be alone noted—always the same plant from year to year being noticed.

Umana.—Mention whether Schenbiers or Motters scale and shingles are used. Schenbiers are preferred. They may be had of Messrs. Adie and Sons, 50, Princess Street, and at Mr. Bryson's, 60, Princess Street, Edinburgh.

Electricity.—With balls suspended by a linen thread, in connection with a metallic conductor, and under cover, and the degrees of a circle being used to express the degree of tension, from a cheap and convenient Electrometer. Exceeded guess on sealing—ascertains the nature of the electricity.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at South Leith, County of Midlothian, in Lat. 55° 56' N, Long. 3° 10' W, Height above Sea 183 feet.
Distance from Sea 3 miles. During the MONTH of July 1859.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUD.	SUNSHINE.	THERMOMETERS. under Ground.			SEA.		ELECTRICITY.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which these began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 ^h A.M.		6 ^h P.M.		Protected.		Exposed.		7 ^h A.M.		6 ^h P.M.		7 ^h A.M.		6 ^h P.M.		Days on which it fell.	Amount.			— h. A.M. —			Temperature.	Density.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Barometer.	Attach- ed Ther- mometer	Barometer.	Attach- ed Ther- mometer	Highest in Air.	Lowest in Air.	Max. Black bulb in Sun.	Min. Black bulb during Night.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force ††	Direction.	Force ††					3 inches.	12 inches.	22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Barometer, mean corrected reading of Column No. 1 (A.M.),.....= 29.844
Diameter of tube inch; correction for capillarity to be added,.....+ 0.060
Sum,.....29.904
Correction for Temperature from Column No. 2 to be deducted,.....= 0.090
Sum,.....29.814
Mean of the above.....29.813
Correction for Height above Sea-level,.....feet, to add,.....0.201
Barometer corrected and reduced to 32° and Sea-level,.....29.979

Column No. 3 (P.M.),.....=
Capillarity,.....=
Sum,.....
Temp. from Col. 4,.....=
Sum,.....
Barometer, Highest observed reading of Month,.....= 30.10 on the 30th
Lowest do. do.,.....= 29.50 on the 22nd
Difference, or Monthly Range,.....= 0.600

SUMMARY OF THE WINDS.												Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
Direction.	N	NE	E	SE	S	SW	W	NW						
A.M.	3	9	3	0	3	2	9	1						
P.M.	2	7	5	1	0	4	7	4						
Mean.	2	8	4	1	1	3	8	3	0					

Dry bulb Thermometer (mean of Cols. 9 and 11),*.....
Wet bulb Thermometer (mean of Cols. 10 and 12),*.....
† Dew-point Temperature,.....
† Elastic Force of Vapour,.....
† Weight of Vapour in a Cubic Foot of Air,.....
† Additional Weight required to Saturate a Cubic Foot,.....
† Degree of Humidity (Saturation 100),.....

Highest Reading Self-Registering Thermometer in Air and Protected,.....= 75 on the 25th
Lowest do. do.,.....= 2 on the 2nd
Difference, being Monthly Range,.....= 73
Mean of Self-Registering Thermometers in Air and Protected,.....
Mean Daily Range in Air and Protected,.....
Greatest Daily Range, do.,.....
Highest Reading Self-Registering Black Bulb Thermometer in Sun,.....
Lowest do. do.,.....
from Radiation during Night,.....

† In the above columns for the registration of the Force of the Wind, may be entered the number of revolutions, by Professor Robinson's Cup Wind Gauge, which registers the velocity of the Wind—540 revolutions being equal to one statute mile.
* If the readings are taken at 9° and 3°, the 9° readings to be alone taken to account, as the correction for Diurnal Range in Scotland is unknown.
† All these calculated from Glaisher's Hygrometric Tables, Second Edition only.
‡ The Diurnal Range for Scotland is as yet unknown.

N.B.—This Schedule should be returned (post-paid) as early as possible after the completion of the Month, with the Sums correctly added, and the Means deduced.

(Signed) W. Thomson
(Designation) Gardner

No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.

[illegible]

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

INSTRUCTIONS FOR MAKING METEOROLOGICAL OBSERVATIONS

Those persons who kindly furnish, Monthly Tables of the Weather to the Scottish Meteorological Society are requested to attend to the following Instructions, seeing that one of the most important ends of Meteorological Observations is their being comparable with one another; and for this purpose it is requisite that all should, if possible, observe at a like hour, and in a like manner, and have their instruments placed, in so far as circumstances allow, in a like position :

Hour of Observation.—All instruments which are observed twice a day, should be read at the same hour morning and evening, in order to furnish mean results. The Society recommends a *quarter before nine o'clock morning and evening*, as the most convenient hour, but should this be inconvenient for the observer, another hour may be chosen, attending, however, to the above rule, that the evening and morning readings be taken at the same hour, and this hour entered on the Schedule.

DOORWAY—Doors of a vessel and their sash construction are recommended; but any instruments may be used which have adjustable supports, and have been compared. Before this instrument is supplied for use it should be examined, in order to ascertain whether the space above the mercury is free from air. This is done by inclining the instrument somewhat from the vertical position, when, if free from air, the mercury will strike against the upper end of the tube with a sharp tap. The mercury should then completely fill the tube. If any air has got admittance, it should be driven into the stem by reversing the instrument, and tapping it gently with the hand. If it cannot be thus expelled, the instrument is useless till repaired.

The Barometer should be hung in a good light, and perfectly perpendicular, as ascertained by the plumb line; and it ought always to be gently tapped before taking the reading, to prevent adhesion of the mercury to the tube. In reading, the eye ought to be placed on the exact level of the top of the column of mercury. The reading of the attached Thermometer ought always to be the first taking, as the heat of the breath, or the proximity of the person, are apt to influence its readings.

The corrections necessary to be applied to the barometric readings depend on the form of the instrument. The mode of making these corrections, and the tables employed for the purpose, will be found in the 4th Report of the Committee of the Royal Society on Physics and Meteorology,* 1840, page 15. The daily readings given of the Barometer ought to be entered on the Schedule as *readings*, and the corrections only applied to the mean for the month. *Self-Registering Thermometers and Hygrometers*.—These should be placed alongside of each other, in a place freely exposed to the air, but protected from sunshining and from reflected heat, as well as from radiation and from rain, and as just as may be *found* from the general surface of the ground. Different countries use various materials for these purposes, either a double ventilated box with louver-boarded sides, faced at a north window, and projecting 12 inches from the wall, so as to allow a free current of air to pass between the box and the wall; or in a double meat-stall ventilated box with louver-boarded sides, faced in an exposed place, and it possible over grass. Whatever means are finally decided on, the position of the instruments should be mentioned, and should not be changed (without this notice being given to the Secretary) in order that the results of these monthly observations may be strictly comparable with those of another.

The *S. Resisting* Thermometers should be placed exactly horizontal. In the case of the ordinary *maximum* thermometer with clear glass, or steel index, the bulb may be *very slightly* elevated, in order that the mercurial column may be somewhat aided by the force of gravity in pushing forward the float or index; and in the case of the *minimum* thermometer, the bulb must be slightly depressed, to prevent a draining of the spirit to the top of the tube, and also that any part raised in vapour may return to the column. These Thermometers, if read once a-day, should *always be read on the evening*, so that the temperatures marked by the floats indicate the minimum and the maximum of the day on which the reading is taken. N.B.—The readings of these instruments are taken from that extremity of the float which is nearest the *head* of the column or mercury, or of spirit.

The *mathurum* Registering Thermometer, for taking the extreme heat of the sun's rays, should have its bulb blackened and the surface rendered matt, and it should be mounted in a blackened box, whose sides should be so high as to protect the bulb from wind. It should be so placed that the sun's rays have free access to it, during the heat of the day.

The minimum acceptable atmosphere for accelerating the lowest temperature during the night from radiation, should have its bulb similarly blackened and rendered dull, and be similarly mounted. It should be laid out, about sunset, over grass, in a place freely exposed to the sky, but raised on wooden supports a few inches above the surface, and removed during the day.

Town.—The wet bulb requires the mushin covering it to be often changed. In towns once a month, or oftener, if the weather is dusty, and the mushin gets foul; in the country, whenever the mushin seems to be foul. The mushin should always be thoroughly wetted, and freed from straws before being used, and the cotton wad which confines moisture to it should be thoroughly wetted, else it will collect the moisture imperfectly, and yield false results. The cotton wad is best attached by passing its extremity through an aperture in the centre of the mushin, spreading that portion out so as to apply equally round the bulb, and then tying the mushin over the bulb. In frosty weather, water must be poured over the wet bulb, so as to form a thin film of ice on the mushin, the exposure from the ice going on as from the simply wetted bulb.

Mani Ganga—as a "Flemish's Rain Ganges" seem to possess several advantages over others, the Society gives the preference to them; but whatever form he employed, it is recommended that all the stations may yield comparable results, it is ascertained that the Ganges be sown in dry ground, so that the top of the receiver is nearly on a level with the top of the boxes of *close cut grass*, in a place as distant as possible from trees, hedges, high ways, and irregular or broken ground, and the quantity of *Rain*, should, if possible, be registered daily. When more than one Rain Gange is kept, they ought to be placed near each other, but at different heights above the ground, and their indications noted in the general *weather*, mentioning their height above ground—the regular column in the Scheideite being reserved for the ground Rain Gange alone.

False indications of the general direction of the wind in consequence of the pressure of the air on the surface of the ground being so much increased by the neighbourhood of hills, valleys, buildings, etc. Where low clouds are seen drifting off, they therefore indicate the velocity of the wind, — 340 revolutions of the cups, as registered by the instrument, being equal to one statute mile.

Howard: Little Society recommends observers to adopt the usual nomenclature of clouds. The scale of cloud in the visible sky is reckoned from 0 to 10. Thus, a sky quite free from cloud is 0; a sky half covered with cloud is 5; and the whole visible sky covered with cloud is 10. Clouds often covering three-fourths or even more of the visible sky without obstructing the sunshining, so that the indications noted in the column clouds would not necessarily express, or agree with, the column for sunshining. As the full moon, *so long as it is above the horizon*, is thought by some eminent astronomers to have a powerful effect in dispersing clouds, it would be well to note in the General Remarks any facts bearing on this point, for a few days (or nights, as the case may be) before and after every full moon; and the same observations ought to be made at the periods of new moon.

Sunshine.—The number of hours the sun shines during the day should be entered in the proper column.

Thermometers used.—*Ground.*—Though the temperature and hygrometric conditions of the air are those which chiefly influence the growth of crops, it is important for the health of the crop, and for the germination of the seed, that the soil itself should have a certain temperature. To collect facts which may illustrate this, it is recommended to have *Thermometers* sunk 3, 12, and 22 inches below the surface of the ground, to ascertain the temperature of what may be termed the *aggeothermal soil*; and the observer should enter in the Schedule the *kind of soil*; whether *drained or undrained*; and whether naturally *wet or dry*.

Temperature of the Sea.—As the meteorology of the island is incomplete without a knowledge of the mean temperature of the Ocean which surrounds it, the Society strongly recommends taking the temperature of the Sea at a depth of 6 feet or 1 fathom from the end of all piers or rocks round the coast, where free from the influence of river water, and as near as may be about the time of high water. A *Thermometer*, with its bulb fixed in a small tin pincet, covered with a sloping lid and with a weight attached, is sent to the required depth, and in ten minutes drawn up and read. The density of the sea water should, if possible, be taken at the same time. Convenient instruments are furnished by Messrs Apple and Sons.

Direction of Surface.—The temperature of Surfaces of Deep

wells is recommended to be taken whenever practicable, notwithstanding the fact that it may be inconvenient during the following winter months.

Miletics, *Aurora borealis*, *Rana*, *Hyla*, *Dipsosaurus*, *Epidemidion*, *Bombinator*, *Nannophila*, *Psalis*, *Rana*, *Hyla* or *Saxo*, *Triton* or *Desmognathus*, etc., should be especially noticed, together with the exact hour at which they were first seen, their continuance, and direction.

Budding, *Larvae*, and *Flowering* of Trees.—It is necessary to bear in mind that varieties of the same species of tree differ widely in their times of budding and flowering. *Individual* trees or shrubs in each kind should therefore be chosen (if possible every kind), and their indications should be alone noted—always the same plant from year to year being noticed.

Osorio, a member Scotchbonts or Morris's scale and papers are used. Scotchbonts are preferred. They may be had at Messrs Aitb and Sons, 50, Princes Street, and at Mr Bryson, 60, Princes Street, Edinburgh.

Electricity.—Pith balls suspended by a linen thread, in connection with a metallic conductor, and under cover; and the depression of a circle being used to express the degree of repulsion, form a cheap and convenient Electrometer. Exposed glass or sealing-wax ascertains the nature of the electricity.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Callith Gardens County of Midlothian, in Lat. _____, Long. _____, Height above Sea 103 feet.

Distance from Sea 3 miles.

During the MONTH of July 1857.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUD.	SUNSHINE.	THERMOMETERS. under Ground.			SEA.		ELECTRICITY.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which these began and ended.	Days of Month.	
	7 ^h A.M.		6 ^h P.M.		PROTECTED.		EXPOSED.		7 ^h A.M.		6 ^h P.M.		7 ^h A.M.		6 ^h P.M.		Days on which it fell.	Amount.			— ^h A.M.			Temperature.	Density.				OZONE. 0 to 10
	Barometer.	At- tached Ther- mometer	Barometer.	At- tached Ther- mometer	Highest in Air.	Lowest in Air.	Max. Black bulb in Sun.	Min. Black bulb during Night.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	Direction.	Force					3 inches.	12 inches.	22 inches.						
	inches.	"	inches.	"	"	"	"	"	"	"	"	"	"	"	"	"	"	days.			inches.	"	"	"	"				"
1	30.16	64	30.11	67	64				55	53	59	53	NE	1	SE	1										Passing clouds through both the day.	1		
2	30.09	63	30.07	66	63				56	52	63	59	SE	2	SE	2										Overcast early, clearing passing clouds.	2		
3	30.04	64	30.02	68	64				60	57	63	59	SE	1	SE	1										Overcast and misty, passing clouds.	3		
4	30.08	67	30.10	72	73				66	61	71	64	SE	1	SE	1										Partly clear, passing clouds.	4		
5	30.01	68	30.09	71	71				67	64	65	61	SE	1	SE	1										Overcast, passing clouds.	5		
6	30.15	69	30.00	70	69				68	63	66	63	SE	1	SE	1										Overcast, passing clouds.	6		
7	30.03	68	30.03	71	71				65	60	65	59	SE	1	SE	1										Overcast, passing clouds.	7		
8	30.08	67	30.10	73	71				63	57	68	61	SE	1	SE	1										Overcast, passing clouds.	8		
9	30.09	69	30.10	73	77	53			69	61	74	63	SE	1	SE	1										Overcast, passing clouds.	9		
10	29.99	72	29.98	75	83	59			74	67	76	66	SE	1	SE	1										Overcast, passing clouds.	10		
11	29.91	71	29.18	73	70	60			66	59	67	61	SE	1	SE	1										Overcast, passing clouds.	11		
12	30.01	66	30.04	61	66	51			56	53	63	59	SE	1	SE	1										Overcast, passing clouds.	12		
13	30.13	66	30.10	69	69	19			63	60	68	59	SE	1	SE	1										Overcast, passing clouds.	13		
14	30.01	67	30.00	71	73	50			69	63	66	59	SE	1	SE	1										Overcast, passing clouds.	14		
15	29.98	68	29.95	72	79	50			70	61	69	60	SE	1	SE	1										Overcast, passing clouds.	15		
16	29.99	71	29.59	71	71	62			68	64	68	59	SE	1	SE	1										Overcast, passing clouds.	16		
17	29.92	68	29.76	63	58	51			54	53	58	52	SE	1	SE	1										Overcast, passing clouds.	17		
18	29.82	60	29.87	60	56	52			53	53	53	53	SE	1	SE	1										Overcast, passing clouds.	18		
19	29.93	60	29.87	64	67	50			57	57	62	60	SE	1	SE	1										Overcast, passing clouds.	19		
20	29.87	64	29.93	66	68	51			65	61	65	60	SE	1	SE	1										Overcast, passing clouds.	20		
21	29.88	63	29.87	64	64	53			65	61	65	60	SE	1	SE	1										Overcast, passing clouds.	21		
22	29.88	61	29.94	61	65	53			63	53	63	53	SE	1	SE	1										Overcast, passing clouds.	22		
23	29.99	63	29.92	68	69	53			63	57	63	58	SE	1	SE	1										Overcast, passing clouds.	23		
24	29.89	65	29.86	69	72	53			63	57	63	58	SE	1	SE	1										Overcast, passing clouds.	24		
25	29.88	65	29.72	68	75	53			63	57	63	58	SE	1	SE	1										Overcast, passing clouds.	25		
26	29.67	68	29.79	68	72	61			66	57	62	57	SE	1	SE	1										Overcast, passing clouds.	26		
27	29.79	65	29.82	69	70	53			64	59	66	59	SE	1	SE	1										Overcast, passing clouds.	27		
28	29.86	65	29.88	61	71	51			63	56	61	54	SE	1	SE	1										Overcast, passing clouds.	28		
29	29.87	62	29.66	67	72	46			59	55	64	59	SE	1	SE	1										Overcast, passing clouds.	29		
30	29.64	65	29.13	64	70	47			63	60	62	56	SE	1	SE	1										Overcast, passing clouds.	30		
31																											Overcast, passing clouds.	31	
Sums.	27.8	1970							1881	1743																			
Means.	29.929	65.7							62.7	58.1																			
Index Errors.	+0.60		+0.60		-1.2	-1.2																							
Correction for Diurnal Range.																													
Corrected Means.																													
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27		

Barometer, mean corrected reading of Column No. 1 (A.M.),.....= 29.929
Diameter of tube _____ inch; correction for capillarity to be added,....+ .060
Sum,..... 29.989
Correction for Temperature from Column No. 2 to be deducted,.....= -.101
Sum,..... 29.888

Mean of the above 29.888
Correction for Height above Sea-level, _____ feet, to add,..... .201
Barometer corrected and reduced to 32° and Sea-level, 30.089

Barometer, Highest observed reading of Month,.....= 30.16 on the 1st
Lowest do. do.,.....= 29.18 on the 30th
Difference, or Monthly Range,.....= 0.98

SUMMARY OF THE WINDS.												Mean Force.	Mean Velocity in miles per day.
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.		
A.M.	2	3	4	0	0	4	12	5	0				
P.M.	1	5	3	0	0	3	12	5	0				
Mean.	1	4	4	0	0	4	12	5	0				

Dry bulb Thermometer (mean of Cols. 9 and 11),*.....
Wet bulb Thermometer (mean of Cols. 10 and 12),*.....
† Dew-point Temperature,.....
† Elastic Force of Vapour,.....
† Weight of Vapour in a Cubic Foot of Air,.....
† Additional Weight required to Saturate a Cubic Foot,.....
† Degree of Humidity (Saturation 100),.....

Highest Reading Self-Registering Thermometer in Air and Protected, 82 on the 10th
Lowest do. do. do., 46 on the 29th
Difference, being Monthly Range,..... 36
Mean of Self-Registering Thermometers in Air and Protected,
Mean Daily Range in Air and Protected,
Greatest Daily Range, do., on the
Highest Reading Self-Registering Black Bulb Thermometer in Sun, on the
Lowest do. do. from Radiation during Night, on the

(Signed) W. Thomson
(Designation) Gardener

N.B.—This Schedule should be returned (post-paid) as early as possible after the completion of the Month, with the Sums correctly added, and the Means deduced. No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.

[illegible][illegible]

FOREST TREES.	In flower.	In leaf buds.	In leaf.	Divested of leaves.	CROPS mentioning variety.	Soiling or planting.	Appearing above ground.	In flower.	Eye cut
Alder,					Barley,				
Asch,					Bare or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Blm,					Beans,				
Larch,					Peas,				
Time,					Potatoes,				
Rak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

INSTRUCTIONS FOR MAKING METEOROLOGICAL OBSERVATIONS

Those Persons who kindly furnish Monthly Tables of the Weather to the Scottish Meteorological Society are requested to attend to the following Instructions, seeing that one of the most important ends of Meteorological Observations is their being comparable with one another; and for this purpose it is requisite that all should, if possible, observe at a like hour, and in a like manner, and have their instruments placed, in so far as circumstances allow, in a like position:

Hour of Observation.—All instruments which are observed twice a day, should be read at the same hour morning and evening, in order to furnish near results. The Society recommends, in order to avoid morning and evening, as the most convenient hour; but should this be inconvenient for the observer, another hour may be chosen, attending, however, to the above rule, that the evening and morning readings be taken at the same hour, and this hour entered on the Schedule.

Caution.—Barometers of Messrs. Adams and Sons' construction are recommended; but any instruments may be used which have adjustable surfaces, and have been compared. Before this instrument is suspended for use it should be examined, in order to ascertain whether the space above the mercury is free from air. This is done by inclining the instrument somewhat from the vertical position, when, if free from air, the mercury will strike against the upper end of the tube with a sharp tap. The mercury should then completely fill the tube. If any air has got admittance, it should be driven into the crevice by revolving the instrument, and tapping it gently with the hand. If it cannot be thus expelled, the instrument is useless till repaired.

The barometer should be hung in a good light; and perfectly perpendicular, as ascertained by the plumb line; and it ought always to be gently tapped before taking the reading, to prevent adhesion of the mercury to the tube. In reading the eye ought to be placed on the exact level of the top of the column of mercury. The reading of the attached Thermometer ought always to be the first taken, as the heat of the breath, or the proximity of the person, are apt to influence its readings.

The corrections necessary to be applied to the Barometric readings depend on the form of the instrument. The mode of making these corrections, and the tables employed for the purpose, will be found in this "Report of the Committee of the Royal Society on Physics and Meteorology," 1840, price 1s. The daily readings of the Barometer ought to be entered on the Schedule as *read off*, and the corrections only applied to the mean for the month. *Self-Registering Thermometers and Hygrometers*—These should be placed alongside of each other, in a place freely exposed to the air, but protected from sunshine, and from reflected heat, as well as from radiation and from rain, and as near as may be *four feet* from the general surface of the ground. Different countries use various uses for this purpose, either a double ventilated box with four-inch boards, fixed at a slant a free current of air to pass between the box and the wall; or, in a double metal-plate ventilated box with four-inch boards, fixed in an exposed place, and it possible over-grass. Whatever means are finally decided on, the position of the instruments should be mentioned, and should not be changed (without due notice being given to the Secretary) in order that the results of one month's observations may be strictly comparable with those of another.

The *Sacrosanctum Theomercers* should be placed exactly horizontal. In the case of the ordinary *maximum* Theomercery, with clay, glass, or seed index, the bulb may be *very slightly* elevated, in order that the mercurial column may be somewhat aided by the force of gravity in pushing forward the float or index; and in the case of the *minimum* Theomercery, the float must be slightly depressed, to prevent a draining of the spirit to the top of the tube, and also that any part raised in vapour may return to the column. These Theomercers, if read once a-day, should *always be read on the evenings*, so that the temperatures marked by the floats indicate the minimum and the maximum of the day on which the reading is taken. N.B.—The readings of these instruments are taken from that extremity of the float which is nearest the *head* of the column, mercury or of spirit.

The *maximam*. Registering Thermometry, for taking the extreme heat of the sun's rays, should have its bulb blackened and the surface rendered dull, and it should be mounted in a blackened box, whose sides should be so high as to protect the bulb from wind. It should be so placed that the sun's rays have free access to it during the heat of the day.

The *minimum Registering Thermometry*, for ascertaining the lowest temperature during the night from radiation, should have its bulb similarly blackened and rendered dull, and be similarly mounted. It should be laid out, about sunset, over grass, in a place freely exposed to the sky, but raised on wooden supports a few inches above the surface, and covered during the day.

Hygrometry.—The wet bulb requires the mesh covering it to be often changed. In towns once a month, or often, if the weather is disty, and the mesh gets foul; in the country, wherever the mesh seems to be good. The mesh should

always be thoroughly wetted, and freed from starch, before being used. The cotton wick which conducts moisture to it should not be thoroughly wetted, else it will conduct the moisture inward perfectly, and yield false results. The cotton wick is best attached by passing its extremity through an aperture in the centre of the muslin, spreading that portion out so as to apply equally round the bulb, and then tying the muslin over the bulb. In frosty weather, water must be poured over the wet bulb, so as to form a thin film of ice on the surface, the evaporation from the ice going on as from the simply wetted bulb.

Rain Gauge.—As a Fleming's Rain Gauge¹ seems to possess several advantages over others, the Society gives the preference to them; but whatever form be employed, in order that all the Stations may yield comparable results, it is recommended that the Gauge be sunk in the ground, so that the top of the receiver is nearly on a level with the top blades of *close cut grass*, in a place as distant as possible from trees, houses, high walls, and irregular or broken ground, and the *groundwork* of *Rain, should, if possible, be registered daily*. When more than one Rain Gauge's depth, they ought to be placed near each other, but at different heights above the ground, and their indications noted in the *general remarks*, mentioning their height above ground—the *vertical column* in the Schedule being reserved for the ground Rain gauge alone.

Winds—selected Winds—names of Weather-cocks are apt to give false indications of the general direction of the wind, in consequence of the currents of air at the surface of the globe, being so much influenced by the neighbourhood of hills, valleys, buildings, etc. Where low clouds are seen drifting along their direction, in reference to known objects, or as noted by means of a mirror on which a compass may be laid, or by means of a current-mirror fixed over the centre of a pocket compass, will, in general, give the true direction of the current of air near the earth's surface if these clouds are near and immediately over land; that is, in or near the zenith of the observer. The motion of the higher strata of clouds gives no such indication. Failing the clouds, the general direction of the smoke of a hamlet or village, or of a tall chimney, gives a better indication of the general direction of the wind than any wind-vane. The observer should state whether he has ascertained the direction by reflection or otherwise. For mode of instruments, see the wind, see 4. Directions for Reading Instruments.—Lind's Anemometer is commonly used for this purpose, but the best Anemometer of moderate price yet invented is Professor Robinson's Cup Wind Gauge, which registers the velocity of the wind—350 revolutions of the cups, as registered by the instrument, be55 equal to one static mile.

Clouds—The Society recommends observers to adopt the Howard nomenclature of clouds. The scale of cloud in the visible sky is reckoned from 0 to 10. Thus, a sky quite free from cloud is 0; a sky half covered with cloud is 5; and the whole visible sky covered with cloud is 10. Clouds often cover three-fourths or even more of the visible sky without obstructing the sunshining, so that the indications noted in the column for clouds would not necessarily express, or agree with, the column for sunshining. As the astrolonomer, so *long as it is above the horizon*, is thought by some eminent astronomer to have a powerful effect in dispersing clouds, it would be well to note in the General Remarks any facts bearing on this point, for a few days (or nights, as the case may be) before and after every full moon; and the same observations ought to be made at the periods of new moon.

Sunshine—The number of hours the sun shines during the day should be entered in the proper column.

Thermomeres under Ground.—Though the temperature and hygrometric conditions of the air are those which chiefly influence the growth of crops, it is important for the health of the crop and for the germination of the seed, that the soil itself should have a certain temperature. To collect facts which may illustrate this, it is recommended to have Thermometers sunk 3, 9, 12, and 22 inches below the surface of the ground, to ascertain the temperatures at those depths, and to observe the effect of the variations of what may be termed the agricultural soil; and the observations should enter in the Schedule the *kind* of soil, whether drained or undrained; and whether naturally wet or dry.

Temperature of the Sea.—As the meteorology of the island is incomplete without a knowledge of the mean temperature of the Ocean which surrounds it, the Society strongly recommends taking the temperature of the Sea at a depth of 6 feet or 1 fathom from the end of all piers or rocks round the coast, where free from the influence of river waters, and as near as may be about the time of high water. A Thermometer with its bulb fixed in a small tin cylinder covered with a sloping lid, and with a weight attached, is best adapted for the purpose; and in thermutes drawn up and read, is subject to the least error. The density of the sea water, and in some instances, if possible, the salinity thereof. Convenient instruments are furnished by Messrs Barthelemy and Son.

Temperature of Springs.—The temperature of Springs or Deep Wells is recommended to be taken whenever practicable, mentioning whether Spring or Well, and its depth from the surface. *Matern's Aurora Borealis, Removable Depression or Dislocation of Bones, Removable Folds of Rain, Hair or Skin, Tinnitus of Ears, Lightning*, etc., should be specially noticed, together with the exact hour at which they were first seen, their continuance, and direction.

Budding, leafing, and flowering of trees.—It is necessary to bear in mind that varieties of the same species of tree differ widely in their times of leafing and flowering. *Individual Trees or Shrubs* of each kind should therefore be chosen (if possible early kinds), and their indications should be alone noted—always the same plant from year to year being noticed.

Ozone—attention whether Schouheim's or Mott's scale and papers are used. Schouheim's are preferred. They may be had of Messrs Aldie and Son, 5, Edinburgh. *Princes Street*, and at Mr. Bryson, 60, Princes Street, Edinburgh.

Malecthery—Fith balls suspended by a linen thread, in connection with a metallic conductor, and under cover, and the degree of a circle being used to express the degree of repulsion, form a cheap and convenient electrometer. Existed glass or sealing-wax ascertains the nature of the electricity.

was ascertains the nature of the electricity

EDINBURGH.

7. *Portland Street,*

10. 12. 1924.

Ser.^y Meter.

D. Everett,

METEOROLOGICAL RETURNS.

Salisbury

Repeat 3rd dec. in Power and 1st in Rev. B.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Warrington County of Cheshire, in Lat. 53° 27' N, Long. 2° 40' W, Height above Sea 183 feet.
Distance from Sea 3 miles. During the MONTH of August 1859.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUD.	SUNSHINE.	THERMOMETERS, under Ground.			SEA.	OZONE.	ELECTRICITY.	GENERAL REMARKS, As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which these began and ended.	Days of Month.
	7 h. A.M.		6 h. P.M.		PROTECTED.		EXPOSED.		7 h. A.M.		6 h. P.M.		7 h. A.M.		6 h. P.M.		Days on which it fell.	Amount.			h. A.M.							
	Barometer.	Attach- ed Ther- mometer	Barometer.	Attach- ed Ther- mometer	Highest in Air.	Lowest in Air.	Max. Black bulb in Sun.	Min. Black bulb during Night.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.					3	12	22					
																					inches.	inches.	inches.					
1	29.73	60.6	29.72	60.6					61.4	58.6	61.4	58.6	W		W											Passing clouds and heavy shower.	1	
2	29.74	60.6	29.76	60.6					61.4	58.6	61.4	58.6	W		W											Passing clouds with fine intervals of sun.	2	
3	29.73	60.6	29.75	60.6					61.4	58.6	61.4	58.6	W		W											Passing clouds, the sun do and heavy shower.	3	
4	29.74	60.6	29.75	60.6					61.4	58.6	61.4	58.6	W		W											Cloudy with fine intervals of sun and shower.	4	
5	29.75	60.6	29.76	60.6					61.4	58.6	61.4	58.6	W		W											Heavy shower, passing through heavy rain.	5	
6	29.76	60.6	29.77	60.6					61.4	58.6	61.4	58.6	W		W											Partly overcast, falling clouds, shower, shower.	6	
7	29.77	60.6	29.78	60.6					61.4	58.6	61.4	58.6	W		W											Passing clouds, shower, falling clouds, shower, shower.	7	
8	29.78	60.6	29.79	60.6					61.4	58.6	61.4	58.6	W		W											Passing clouds with fine intervals of sun and shower.	8	
9	29.79	60.6	29.80	60.6					61.4	58.6	61.4	58.6	W		W											Heavy shower, shower, shower, shower.	9	
10	29.80	60.6	29.81	60.6					61.4	58.6	61.4	58.6	W		W											Cloudy, fine, shower, shower, shower.	10	
11	29.81	60.6	29.82	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	11	
12	29.82	60.6	29.83	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	12	
13	29.83	60.6	29.84	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	13	
14	29.84	60.6	29.85	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	14	
15	29.85	60.6	29.86	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	15	
16	29.86	60.6	29.87	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	16	
17	29.87	60.6	29.88	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	17	
18	29.88	60.6	29.89	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	18	
19	29.89	60.6	29.90	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	19	
20	29.90	60.6	29.91	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	20	
21	29.91	60.6	29.92	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	21	
22	29.92	60.6	29.93	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	22	
23	29.93	60.6	29.94	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	23	
24	29.94	60.6	29.95	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	24	
25	29.95	60.6	29.96	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	25	
26	29.96	60.6	29.97	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	26	
27	29.97	60.6	29.98	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	27	
28	29.98	60.6	29.99	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	28	
29	29.99	60.6	30.00	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	29	
30	30.00	60.6	30.01	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	30	
31	30.01	60.6	30.02	60.6					61.4	58.6	61.4	58.6	W		W											Overcast, shower, shower, shower, shower.	31	
Sums.	23.7	896	2105	1593					1902	1765																		
Means.	29.74	60.6	29.75	60.6					61.4	58.6	61.4	58.6	W		W													
Index Errors.	+0.0		-0.2						+1	-0.2	+1	-0.2																
Correction for Diurnal Range.									61.4	58.6	61.4	58.6																
Corrected Means.	29.80		29.81						61.4	58.6	61.4	58.6																
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	

Barometer, mean corrected reading of Column No. 1 (A.M.).....= Column No. 3 (P.M.).....=

Diameter of tube inch; correction for capillarity to be added.....+ Capillarity.....= +

Sum..... 29.804 Sum.....

Correction for Temperature from Column No. 2 to be deducted.....= - Temp. from Col. 4.....= -

Sum..... 29.713 Sum.....

Mean of the above 29.713

Correction for Height above Sea-level, feet, to add,201

Barometer corrected and reduced to 32° and Sea-level, 29.914

Barometer, Highest observed reading of Month.....= 30.090 on the 22nd

Lowest do. do.....= 29.100 on the 30th

Difference, or Monthly Range,= 0.990

SUMMARY OF THE WINDS.												Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
Direction.	N	NE	E	SE	S	SW	W	NW	W	NW	W			
A.M.	3	2	1	0	0	13	9	3	0					
P.M.														
Mean.														

Dry bulb Thermometer (mean of Cols. 9 and 11),*..... 60.0 60.3

Wet bulb Thermometer (mean of Cols. 10 and 12),*..... 54.8 55.2

† Dew-point Temperature..... 50.2 50.7

† Elastic Force of Vapour..... 364 371

† Weight of Vapour in a Cubic Foot of Air..... 70

† Additional Weight required to Saturate a Cubic Foot..... 70

† Degree of Humidity (Saturation 100).....

Highest Reading Self-Registering Thermometer in Air and Protected, 76.5 on the 24th

Lowest do. do. do. 45.0 on the 29th

Difference, being Monthly Range, 31.5

Mean of Self-Registering Thermometers in Air and Protected, 59.8 - 1.9 = 57.9 } 58.8

Mean Daily Range in Air and Protected, 16.8

Greatest Daily Range, do., on the

Highest Reading Self-Registering Black Bulb Thermometer in Sun, on the

Lowest do. do. do. from Radiation during Night, on the

†† In the above columns for the registration of the Force of the Wind, may be entered the number of revolutions, by Professor Robinson's Cup.

* If the readings are taken at 9° and 3°, the 9° readings to be alone taken to account, as the correction for Diurnal Range in Scotland is unknown.

† All these calculated from Glaisher's Hygrometric Tables, Second Edition only.

† The Diurnal Range for Scotland is as yet unknown.

N.B.—This Schedule should be returned (post-paid) as early as possible after the completion of the Month, with the Sums correctly added, and the Means deduced. No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.

Meteorological Observations
Taken at Waltham Park, County of Middlesex, Height above the sea 183 feet
Distance from sea 3 miles.
During the month of September 1859

63

Day of Month	Barometer		Self-Registering Thermometer		Hygrometer		Wind		General Remarks
	7 A.M.	6 P.M.	7 A.M.	6 P.M.	7 A.M.	6 P.M.	7 A.M.	6 P.M.	
	inches	inches	inches	inches	inches	inches	Directions	Directions	As to occurrence of Thunder, Lightning, Storms, Hail, etc. etc. Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which this began and ended.
1	29.33	29.34	57	63	54	51	SE	SE	Passing clouds throughout the day. Air cool. Barometer fell 1/2 inch at 4 P.M. and rose again.
2	29.35	29.48	57	63	56	53	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
3	29.39	29.10	58	63	54	51	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
4	29.70	29.83	58	59	54	50	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
5	29.98	29.87	59	64	57	53	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
6	29.44	29.40	61	61	58	55	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
7	29.49	29.59	62	64	58	55	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
8	29.61	29.63	51	67	61	57	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
9	29.20	29.87	63	64	54	53	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
10	29.61	29.87	63	63	59	55	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
11	29.77	30.08	59	62	56	53	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
12	30.12	29.88	59	66	54	51	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
13	29.39	29.63	58	61	53	53	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
14	29.67	29.66	57	58	53	49	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
15	29.35	29.51	57	60	52	50	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
16	29.63	29.75	56	58	53	51	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
17	29.86	29.88	57	60	54	51	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
18	29.78	29.67	56	57	54	53	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
19	29.64	29.68	56	60	53	49	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
20	29.62	29.44	57	58	52	49	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
21	29.21	29.09	57	60	50	47	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
22	29.12	29.42	57	59	53	49	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
23	29.43	29.37	57	62	52	50	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
24	29.39	29.47	60	68	62	59	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
25	29.32	29.40	61	69	60	57	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
26	29.50	29.62	58	62	57	53	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
27	29.78	29.79	56	63	51	48	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
28	29.34	29.37	57	63	53	51	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
29	29.48	29.33	54	58	53	50	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
30	29.45	29.52	54	61	53	51	SE	SE	Passing clouds. No breeze. Air cool. Barometer rose 1/2 inch at 4 P.M. and rose again.
Sums.	15.55	16.67		185	136		1.15		
Means.	29.518	55.6		61.8	45.5		54.9	52.0	Rain
Corr. Index Errors.	+0.60	+0.60							
Correction for Diurnal Range.									
Corrected Means.	29.578								
No. of Column.	1	2	3	4	5	6	7	8	9

Barometer, mean corrected reading of Column No. 1 (A.M.) = 29.578
Column No. 3 (P.M.) = 55.6
Barometer, Highest observed reading of Month = 30.020 on the 12th
Lowest do. = 28.990 on the 3rd
Difference, or Monthly Range, = 1.030

Correction for Temperature from Column No. 2 to be deducted = 0.71
Temp. from Col. 4 = 29.507
Mean of the above = 29.507
Correction for Height above Sea-level, feet, to add, = 2.61
Barometer corrected and reduced to 32° and Sea-level, = 29.708

Dry bulb Thermometer (mean of Cols. 9 and 11) = 54.5
Wet bulb Thermometer (mean of Cols. 10 and 12) = 51.1
Dew-point Temperature = 47.2
Elastic Force of Vapour = 32.5
Weight of Vapour in a Cubic Foot of Air = 33.1
Additional Weight required to Saturate a Cubic Foot = 7.6
Degree of Humidity (Saturation 100) = 78

Highest Reading Self-Registering Thermometer in Air and Protected = 69.0 on the 25th
Lowest do. = 38.0 on the 23rd
Difference, being Monthly Range, = 31.0
Mean of Self-Registering Thermometers in Air and Protected = 58.6 - 1.5 = 57.1
Mean Daily Range in Air and Protected = 16.3
Greatest Daily Range, do., = 16.3
Highest Reading Self-Registering Black Bulb Thermometer in Sun, = 78.0 on the 25th
Lowest do. = 69.0 on the 23rd

N.B.—This Schedule should be returned (post-paid) as early as possible after the completion of the Month, with the Sums correctly added, and the Means deduced. No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.

~~Harrold~~

Dalkeith

5

4

E W
Galbreath
Sept 59

Sept 159

 T_G

DR STARK.

Sec., Meteorological Society.

21, Rutland Street.

EDINBURGH

METEOROLOGICAL RETURNS.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.												
FOREST TREES.		In Flower.	Leaf Buds first appear.	In Leaf.	Divested of Leaves.	CROPS. mentioning variety.	Planting.	Sothing or sowing.	Aperting above ground.	In Ear.	First Cut	or Raised.
Alder.....						Bartley.....						
Beech.....						Bere or Biggs.....						
Birch.....						Oats.....						
Elm.....						Wheat.....						
Larch.....						Peas.....						
Lime.....						Potatoes.....						
Oak.....						Rye Grass.....						
Sycamore or Plane.....												

SHRUBS, ETC.		First in Blossom.	FRUITS.	First in Fruit ripe Generally.	MIGRATORY BIRDS.							First Arrival.	Departure.	
Barberry.....		Apple.....			Cuckoo.....	House-Swallow.....	Lapwing.....	Flover.....	Sand-Martin.....	Starling.....	Gull or Corn Grike.....	Other Birds, naming them—		
Bourtree or Elder.....		Black Currant.....												
Broom.....		Cherry.....												
Hazel.....		Gean.....												
Hawthorn.....		Gooseberry.....												
Holly.....		Pear.....												
Laburnum.....		Peach.....												
Lilac.....		Plum.....												
Meadow.....		Strawberry.....												
Mountain Ash or Rowan.....														
Red Flowering Currant.....														
Rhododendron Ponticum.....														
Viburnum.....														

Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection; and the Agricultural condition of the district generally.

Whistler

Dear Sir

Enclosed is a correct statement
of what was done for the Hydro-
meter by Professor Everett —
This report is as correct as
we can possibly make it
W. Thomas

Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection; whether any have suffered from blight, disease, etc. Whether Epizootic disease prevails among Cattle; and the Agricultural condition of the district generally.

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	First in Fruit Ripe generally.	MIGRATORY BIRDS.	First Arrival.	First Departure.
Barberry,.....		Apple,.....			Cuckoo,.....		
Bourtree or Elder,.....		Black Currant,.....			Curlew,.....		
Broom,.....		Cherry,.....			House-Swallow,.....		
Hazel,.....		Gean,.....			Lapwing,.....		
Hawthorn,.....		Gooseberry,.....			Flower,.....		
Holly,.....		Peach,.....			Sand-Martin,.....		
Laburnum,.....		Pear,.....			Starling,.....		
Lilac,.....		Plum,.....			Swan,.....		
Mezerion,.....		Strawberry,.....			Rail or Corn Crake,.....		
Mountain Ash or Rowan,.....					Other Birds, naming them—		
Red Flowering Currant,.....							
Rhododendron Ponticum,.....							
Whin,.....							

FOREST TREES.	In Flower.	Leaf first appear.	In Leaf.	First of Leaves.	CROPS.	Sowing or Planting.	Reaping or above Ground.	In Ear.	First Cut or Raised.
Alder,.....					Barley,.....				
Ash,.....					Bere or Bigg,.....				
Beech,.....					Oats,.....				
Birch,.....					Wheat,.....				
Elm,.....					Beans,.....				
Larch,.....					Potatoes,.....				
Lime,.....					Turnips,.....				
Oak,.....					Rye Grass,.....				
Sycamore or Plane,.....									

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

To *Mr J. D. Everett,*
Sec^y Meteorological Society,
10, St. Andrew Square,
Edinburgh
Berners

METEOROLOGICAL RETURNS.

Dalhousie

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Kerrnath Garraus County of Glasgow, in Lat. _____, Long. _____, Height above Sea 183 feet.
Distance from Sea 3 miles. During the MONTH of November 1859.

Days of Month.		BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUD.	SUNSHINE.	THERMOMETERS. under Ground.			TEMPERATURE OF SPRING OR WELL.	TEMPERATURE OF SEA.	OZONE.	ELECTRICITY.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which these began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		9 h. A.M.		6 h. P.M.		PROTECTED.		EXPOSED.		9 h. A.M.		6 h. P.M.		9 h. A.M.		6 h. P.M.		Days on which it fell.	Amount.			h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Highest in Air.	Lowest in Air.	Max. Black bulb in Sun.	Min. Black bulb during Night.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.					3 inches.	12 inches.	22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
1	28.26	39	28.82	42.45	33			42	41	43	41	No. 2		No. 2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												</

Barometer, mean corrected reading of Column No. 1 (A.M.),
Diameter of tube _____ inch; correction for capillarity to be added,
Sum,
Correction for Temperature from Column No. 2 to be deducted,
Sum,
Mean of the above
Correction for Height above Sea-level, _____ feet, to add,
Barometer corrected and reduced to 32° and Sea-level,
Dry bulb Thermometer (mean of Cols. 9 and 11),
Wet bulb Thermometer (mean of Cols. 10 and 12),
† Dew-point Temperature,
† Elastic Force of Vapour,
† Weight of Vapour in a Cubic Foot of Air,
† Additional Weight required to Saturate a Cubic Foot,
† Degree of Humidity (Saturation 100),
Column No. 3 (P.M.),
Capillarity,
Sum,
Temp. from Col. 4,
Sum,
Barometer, Highest observed reading of Month, on the
Lowest do. do. on the
Difference, or Monthly Range,
SUMMARY OF THE WINDS.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.	4	2	2	2	2	8	6	4	0	
P.M.										

Highest Reading Self-Registering Thermometer in Air and Protected, on the
Lowest do. do. on the
Difference, being Monthly Range,
Mean of Self-Registering Thermometers in Air and Protected,
Mean Daily Range in Air and Protected,
Greatest Daily Range, do.,
Highest Reading Self-Registering Black Bulb Thermometer in Sun, on the
Lowest do. do. from Radiation during Night, on the
(Signed) Mr. Thomson
(Designation) Gardener
N.B.—This Schedule should be returned (post-paid) as early as possible after the completion of the Month, with the Sums correctly added, and the Means deduced. No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.

INSTRUCTIONS FOR MAKING METEOROLOGICAL OBSERVATIONS.

Those persons who kindly furnish Monthly Tables of the Weather to the Scottish Meteorological Society are requested to attend to the following instructions, seeing that one of the most important ends of Meteorological Observations is their being comparable with one another and for this purpose it is requisite that all should, if possible, observe at a like hour and in a like manner, and that their instruments placed in so far as circumstances allow, in a like position.

Hour of Observation.—All instruments which are observed twice a-day, should be read at the same hour morning and evening, in order to furnish mean readings. The Society recommends a quarter before nine o'clock morning and evening as the most convenient hour; but should this be inconvenient for the observer, another hour may be chosen, attending, however, to the above rule, that the evening and morning readings be taken at the same hour, and this hour entered on the Schedule.

Barometer.—Barometers of Messrs. Aitke and Son's construction are recommended; but any instruments may be used which have adjustable surfaces and have been compared. Before this instrument is suspended for use it should be examined in order to ascertain whether the space above the mercury is free from air. This is done by inclining the instrument somewhat from the vertical position, when, if free from air, the mercury will strike against the upper end of the tube with a sharp tap. The mercury should then completely fill the tube. If any air has got admittance, it should be driven into the cistern by reversing the instrument, and tapping it gently with the hand. If it cannot be thus expelled, the instrument is useless and will require repair.

The barometer should be hung in a good light, and perfectly perpendicular, as ascertained by the plumb line; and it ought always to be gently tapped before taking the reading, to prevent adhesion of the mercury to the tube. In reading, the eye ought to be placed on the exact level of the top of the column of mercury. The reading of the attached Thermometer ought always to be the first taken, as the heat of the breath, or the proximity of the person, are apt to influence its readings.

The corrections necessary to be applied to the Barometric readings depend on the form of the instrument. The mode of making these corrections, and the tables employed for the purpose, will be found in the "Report of the Committee of the Royal Society on Physics and Meteorology," 1840, price 1s. The daily readings of the Barometer ought to be entered on the Schedule as *read off*, and the corrections only applied to the mean for the month.

Self-Registering Thermometers and Hygrometers.—These should be placed alongside of each other, in a place freely exposed to the air, but protected from sunning, and as near as may be, as well as from radiation and from wind, and as near as possible from the general surface of the ground. Different contrivances are used for this purpose, either a double ventilated box with hinged boards, fixed at a north window, and projecting 12 inches from the wall, so as to allow a free current of air to pass between the box and the wall; or in a double neat-sate ventilated box with slanting-boarded sides, fixed in an exposed place, and if possible over grass. Whatever means are finally decided on, the position of the instruments should be mentioned, and should not be changed (without the notice being given to the Secretary), in order that the results of one month's observations may be strictly comparable with those of another.

The *Self-Registering Thermometers* should be placed exactly horizontal. In the case of the ordinary maximum Thermometer, with clay glass, or steel index, the bulb may be very slightly elevated, in order that the mercurial column may be somewhat aided by the force of gravity in pushing forward the float or index; and in the case of the *minimum Thermometer*, the bulb must be slightly depressed, to prevent a dripping of the spirit to the top of the tube, and also that any part raised in returning return to the column. These Thermometers, if read once a-day, should always be read *on the evening*, so that the temperatures marked by the floats indicate the minimum and the maximum of the day on which the reading is taken. N.B.—The readings of these instruments are taken from the extremity of the float which is nearest the head of the column of mercury or of spirit.

The *maximum Registering Thermometer*, for taking the extreme heat of the sun's rays, should have its bulb blackened and the surface rendered dull, and it should be mounted in a blackened box, whose sides should be so high as to protect the bulb from wind. It should be so placed that the sun's rays have free access to it during the heat of the day.

The *minimum Registering Thermometer*, for ascertaining the lowest temperature during the night from radiation, should have its bulb similarly blackened and rendered dull, and be similarly mounted. It should be laid out, about sunset, over grass, in a place freely exposed to the sky, but raised on wooden supports a few inches above the surface, and removed during the day.

Hygrometer.—The wet bulb requires the same covering, it to be often changed. In towns once a month, or oftener, if the weather is dusty, and the mistin gas foul; in the country whenever the mistin seems to be foul. The bulb should be covered with thin tissue or blotting paper, below the mistin, and the mistin should always be thoroughly wetted, and freed from starch, before being used; and the cotton wick which conducts moisture to it should be previously soaked in a solution of washing soda, and then in pure water, before being attached in order that it may be thoroughly wetted, else it will conduct the moisture imperfectly, and yield false results. In frosty weather, water

must be poured over the wet bulb, so as to form a thin film of ice on the mistin, the evaporation from the ice going on as from the slightly wetted bulb.

Rain Gauge.—As of Fleming's Rain Gauge, seem to possess several advantages over others, the Society gives the preference to them; but whatever form be employed, in order that all the stations may yield comparable results it is recommended that the Gauge be sunk in the ground, so that the top of the receiver is nearly on a level with the top blades of *clew cut grass*, in a place as distant as possible from trees, houses, high walls, and irregular or broken ground, and the quantity of rain should, if possible, be registered daily. When more than one Rain Gauge is kept, they ought to be placed near each other, but at different heights above the ground, and their indications noted in the *general remarks*, mentioning their height above ground—the regular column in the Schedule being reserved for the ground Rain Gauge alone.

Wind.—Isolated Wind-vanes or Weather-cocks are apt to give false indications of the general direction of the wind, in consequence of the currents of air at the surface of the ground being so much influenced by the neighbourhood of hills, valleys, buildings, etc. Where low clouds are seen drifting along, their direction in reference to known objects, or as noted by means of a mirror on which a compass may be laid, or by means of a circular mirror fixed over the centre of a pocket compass, will, in general, give the true direction of the current of air near the earth's surface; if these clouds are near and immediately over head, that is, in or near the zenith of the observer. The motion of the higher strata of clouds gives no such indication. Rifting the clouds the general direction of the stroke of a house or village, or of a tall chimney, gives a better indication of the general direction of the wind than any wind-vane. The observer should state whether he has ascertained the direction by reduction of observation. For note of estimating the force of the wind, see "Directions for Reading Instruments;" but in all cases it is better to make use of Lind's Anemometer, as presented at Messrs. Aitke and Son's, and enter the greatest force of the wind during the period of observation.

Clouds.—The Society recommends observers to adopt the Howard nomenclature of clouds. The scale of cloud in the visible sky is reckoned from 0 to 10. Thus, a sky quite free from cloud is 0; a sky half covered with cloud is 5; and the whole visible sky covered with cloud is 10. Clouds often cover three-fourths or even more of the visible sky without obstructing the sunshining, so that the indications noted in the column for clouds would not necessarily express, or agree with, the column for sunshining. As the full moon, so long as it is above the horizon, is thought by some eminent astronomers to have a powerful effect in dispersing clouds, it would be well to note in the General Remarks any facts bearing on this point, for a few days (or nights, as the case may be) before and after every full moon; and the same observations ought to be made at the periods of new moon.

Sunshine.—The number of hours the sun shines during the day should be entered in the proper column.

Thermometers under Ground.—Though the temperature and hygrometric conditions of the air are those which chiefly influence the growth of crops, it is important for the health of the crop, and for the germination of the seed, that the soil itself should have a certain temperature. To collect facts which may illustrate this, it is recommended to have Thermometers sunk 3, 12, and 22 inches below the surface of the ground, to ascertain the temperature of what may be termed the agricultural soil; and the observer should enter in the Schedule the *kind of soil*; whether drained or undrained; and whether naturally wet or dry.

Temperature of the Sea.—As the meteorology of the island is incomplete without a knowledge of the mean temperature of the Ocean which surrounds it, the Society strongly recommends taking the temperature of the Sea at a depth of 6 feet or 1 fathom from the end of all piers or rocks round the coast, where free from the influence of river water, and as near as may be about the time of high water. A Thermometer with its bulb fixed in a small tin pail, covered with a sloping lid, and with a weight attached, is best to be employed, and in ten minutes drawn up and read.

Convenient instruments are furnished by Messrs. Aitke and Son.

Temperature of Springs.—The temperature of Springs or Deep Wells is recommended to be taken whenever practicable, mentioning whether Spring or Well, and its depth from the surface.

Barometrical Remarks.—*Removable Falls of Rain, Hail or Snow, Thunder and Lightning*, etc., should be specially noticed, together with the exact hour at which they were first seen, their continuance, and direction.

Building, Leafing, and Flowering of Trees.—It is necessary to bear in mind that varieties of the same species of tree differ widely in their times of leafing and flowering. *Individual Trees or Shrubs of each kind* should therefore be chosen (if possible early kinds), and their indications should be alone noted—always the same plant from year to year being noted.

Orons.—Mention whether Schombert's or Mott's scale and papers are used. Schombert's are preferred. They may be had of Messrs. Aitke and Son's, 50, Princes Street, and at Mr. Bryson's, 60, Princes Street, Edinburgh.

Electricity.—If the bulb suspended by a linen thread, in connection with a metallic conductor, and under cover, and the degrees of a circle being used to express the degree of repulsion, form a cheap and convenient Electrometer. Exposed glass or sealing-wax ascertains the nature of the electricity.

SHRUBS, ETC.		FRUITS.		MIGRATORY BIRDS.		First Departure.	
Barberry.	Blossom.	Apple.	First in Blossom.	First in Fruit.	First in Fruit.	First Departure.	First Arrival.
Bourtree or Elder.		Black Currant.		Curlew.			
Broom.		Cherry.		House-Swallow.			
Hazel.		Gooseberry.		Lapwing.			
Hawthorn.		Holly.		Plover.			
Laburnum.		Peach.		Sand-Martin.			
Linac.		Plum.		Starling.			
Mezerion.		Strawberry.		Swan.			
Mountain Ash or Rowan.				Rail or Corn Crane.			
Red Flowering Currant.				Other Birds, naming them.			
Rhododendron Ponticum.							
Whin.							

Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentifully, or in perfection; whether any have suffered from blight, disease, etc. Whether Epizootic disease prevails among Cattle; and the agricultural condition of the district generally.

FOREST TREES.		CROPS.		In Bar.		First Cut.	
Alder.	In Flower.	Barley.	including variety.	Planting or Sowing.	Aperting or Aperting.	First Cut.	First Cut.
Aspen.		Bare or Blight.					
Beech.		Oats.					
Birch.		Wheat.					
Elm.		Beans.					
Larch.		Peas.					
Lime.		Potatoes.					
Oak.		Turnips.					
Sycamore or Plane.		Rye Grass.					

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

EDINBURGH.

21, Rutland Street,

Sec., Meteorological Society,

DR STARK,

To



H. Purvis Esq
21 Rutland St
Edinburgh

Rain during the month of Dec. 1. 95

Rain is worth 1.95 mek

[illegible]

Highest Reading Self-Registering Thermometer in Air and Protected,	50.0	on the	5th
Lowest do. do. do. do.	17.0	on the	19th
Difference, being Monthly Range,	33.0		
Mean of Self-Registering Thermometers in Air and Protected,	33.9		
Mean Daily Range in Air and Protected,	9.4		
Greatest Daily Range, do.		on the	
Highest Reading Self-Registering Black Bulb Thermometer in Sun,		on the	
Lowest do. do. from Radiation during Night,		on the	

(Designation) Gardener, Dalkeith

N.B.—This Schedule should be returned (post-paid) as early as possible after the completion of the Month, with the Sums correctly added, and Means deducted. No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.

2.

Lal Keith
Dec 159

 T_G

DR STARK,

Sec., Meteorological Society,

21, Rutland Street,

EDINBURGH.

METEOROLOGICAL RETURNS.

[illegible]

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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