

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *March Hall*, County of *Edinburgh*, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of *January* 18*68*.
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. _____				WIND.				RAIN.		CLOUDS.				THERMOMETERS. under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms began and ended.</i>	Days of Month.		
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H-Cup Anemometer No. _____		No. of hours in which it fell.	Amount in inches.	9 A.M.		P.M.		9 h. A.M.						
		Baromete * No.	Attendi- of Ther- mometer	Baromete. No. _____	Attendi- of Ther- mometer	Max. No. _____	Min. No. _____	Max. in Sun's rays No. _____	Min. on Grass. No. _____	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direc- tion.	Force.	Direc- tion.	Force.	Velocity, (0-10), and Direction.	Amount, (0-10), and Species.			Velocity, (0-10), and Direction.	Amount, (0-10), and Species.	No. _____	No. _____	No. _____						
																															inches.	°
1	29.93	44	29.86	40	37	31			36	35	37	30	8	0.5	8	0	R		10											1		
2	30.02	40	30.06	40	37	32			34	33	33	32	8	0.5	8	1	R		10											2		
3	30.04	38	30.02	40	34	26			30	28	28	26	8	0.5	8	0.5	R		10											3		
4	29.93	40	29.85	43	37	26			33	32	38	36	2	2	2	1.5	R	0.5	10											4		
5	29.87	44	29.90	42	38	33			35	34	35	34	2	2	2	0.5	R		10											5		
6	29.88	43	29.85	43	40	33			38	37	38	37	2	2	2	1.5	R		10											6		
7	29.87	44	29.86	44	39	36			39	37	40	39	8	1.5	2	1	R		10											7		
8	29.93	44	29.92	40	40	33			38	36	34	32	8	1	8	1.5	R		10											8		
9	29.93	42	29.88	40	37	29			36	34	32	30	8	1	8	0.5	R		10											9		
10	29.83	36	29.63	37	32	25			28	28	30	28	8	0.5	8	1			5													
11	29.43	42	29.33	44	44	29			35	33	44	42	8	1	8	1.5		0.4	10											11		
12	29.31	45	29.22	47	48	35			44	40	44	41	8	2	8	3	R		10											12		
13	29.06	43	29.25	45	45	35			38	36	38	37	2	8	0.5	2	1	R		10												
14	28.86	49	28.88	50	54	37			49	46	45	42	8	5	8	4	R		10											13		
15	29.01	45	29.42	46	46	36			39	37	42	39	8	4	8	4	R		10											14		
16	29.53	48	29.16	52	53	40			46	42	52	49	8	3	8	5	R		10											15		
17	29.13	51	29.09	45	53	40			48	43	41	38	8	4	8	4	R		10											16		
18	28.82	48	28.14	48	40	39			45	41	42	40	8	4	8	3	R	1.3	10											17		
19	28.27	48	28.80	47	42	36			40	38	38	35	2	1	2	1.5	R		10											18		
20	28.92	42	29.16	39	39	29			31	30	31	29	2	1	2	1			5											19		
21	29.24	40	29.14	41	37	25			29	28	30	28	2	8	0.5	2	0.5		5											20		
22	29.01	41	29.18	42	37	24			34	32	34	32	2	1	2	0.5			10											21		
23	29.57	42	29.80	35	36	27			32	31	29	28	2	0.5	2	1.5			10											22		
24	29.59	38	28.85	42	42	27			32	30	42	38	8	2	8	5	R		10											23		
25	28.78	45	29.30	45	44	37			42	39	38	35	8	4	8	1.5		1.1	3											24		
26	29.72	43	29.83	45	42	33			36	33	42	39	8	1.5	8	1.5			5											25		
27	29.63	47	29.63	50	50	38			49	45	48	46	8	2	8	1.5	R		10											26		
28	29.50	50	29.56	45	49	33			46	42	35	32	8	3	8	1			10											27		
29	29.64	43	29.55	44	41	32			35	33	40	37	2	2	2	2	R		5											28		
30	29.46	47	29.24	50	50	38			45	43	50	47	8	5	8	5	R		10											29		
31	29.13	52	28.72	53	52	46			52	49	49	46	8	5	8	5	R	0.6	10											30		
Sums.	16 11	12	16 12	12 10	13 9	16			26 16	13	26 12	16					1														31	
Means.	13.98	1364	13.26	1364	1317	1020			1194	1125	1199	1124					19	3.90														
Total Corrections for Instrumental Errors.	+0.42		+0.42		-3	+1.0			-7	-4	-7	-4																				
Corrected Means.	29.493		29.470		42.233	9			37.835	38.035	38.035	35.9																				
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	28	29	30		

NOTATION USED IN GENERAL REMARKS.											
a.	denotes aurora.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.
ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.	ci.	cirrus.	ms.	denotes meteor.

TABLE FOR ESTIMATING FORCE OF WIND.					
Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.
0	Calm	1.5	Light breeze	4	Blowing hard
0.5	Very light air	2	Fresh breeze	5	Blowing a gale
1	Light air	3	Very fresh	6	Violent gale

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction +1 = 29.452
for Temp. (Col. 2), = 29.493 - 0.41
"Corrected Mean" of Barometer at 9 P.M., minus the Correction +1 = 29.429
for Temp. (Col. 4), = 29.470 - 0.41
Mean at Station, corrected, and at 32°, = 29.440
Correction for height, feet, above Mean Sea-level, = 2.96
Mean, reduced to 32°, and Sea-level, = 29.736
Highest Reading, corrected for Index error, on the 2 th, = 30.060
Lowest Do., Do., on the 18 th, = 28.140
Difference, or Monthly Range, = 1.920

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 14 th, = 53.7
Lowest in Month, corrected for Index errors, on the 22 th, = 25.0
Difference, or Monthly Range, = 28.7
"Corrected Mean" of all the Highest, (Col. 5), = 42.2
"Corrected Mean" of all the Lowest, (Col. 6), = 33.9
Difference, or Mean Daily Range, = 8.3
** Calculated Mean Temperature of Month, = 38.0

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected, for Index errors), on the th, =
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =
"Corrected Mean" (Col. 8), of Black Bulb Min. on grass, =
Difference of above Means or Range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 37.9
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 36.2 35.9
Computed Temperature of Dew-Point, = 33.32
Do. Elastic Force of Vapour, = 1.1950
Do. Weight of Vapour in a Cubic Foot of Air, = 2.2519
Relative Humidity, (Saturation = 100), = 88.84
RAIN fell on 19 Days; Amount in Inches, = 3.90

WIND.											
Direction	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	4	4	5	2	6	7	2	0	0	1.97	
P.M.	7	2	3	3	4	10	2	0	0	2.00	
Mean.	6	3	4	2	5	9	2	0	0	1.98	3.92

N.B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gummed or Fastened, and Forwarded by Book Post, prepaid.

Observations made and
Return verified by

(Signed) Donald Miller

Great daily range = 15.7 on 14 th

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at March Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of February 1868.
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUDS.				THERMOMETERS.			SEA.	OZONE.	GENERAL REMARKS.	Days of Month.
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.		9 h. A.M.								
		Baromet.	Attach- ed Ther- mometer	Baromet.	Attach- ed Ther- mometer	Max.	Min.	Max.	Min.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	Velocity, (0-10), and Species.	Amount, (0-10), and Species.	Velocity, (0-10), and Species.	Amount, (0-10), and Species.	No. 1.	No. 2.	No. 3.						
		inches.	inches.	inches.	inches.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.					
		inches.	inches.	inches.	inches.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.					
	1	28.32	48	28.94	47	51	34			42	29	35	33	SW	5	SW	4		3							Thunder & Lightning 8 A.M.	1			
	2	29.21	43	29.19	47	39	32			35	33	36	34	SW	3	S.	1.5		5							Snow	2			
	3	29.14	43	29.66	42	39	30			33	32	32	30	SW	3	W.	1.5		5							Snow	3			
	4	29.45	43	29.40	45	43	30			40	37	43	40	SW	4	SW	3		5									4		
	5	29.37	48	29.39	47	48	39			47	42	42	37	SW	6	W.	6		10									5		
	6	29.67	46	29.82	46	44	38			40	37	39	36	SW	3	SW	0.5		10									6		
	7	29.33	46	29.16	48	49	38			43	40	44	41	S.	5	W.	0.5		10									7		
	8	29.60	44	29.91	43	44	30			34	32	31	30	SW	1	N.	0.5		5									8		
	9	29.97	42	29.81	48	49	30			36	33	48	46	SW	1.5	SW	3		10									9		
	10	29.88	51	29.88	50	50	44			49	46	45	41	SW	3	SW	6		10									10		
	11	29.97	47	30.10	45	46	39			41	37	41	38	SW	1.5	SW	2		5									11		
	12	30.08	46	29.92	48	45	38			41	38	44	41	W.	1.5	SW	1		10									12		
	13	29.76	49	29.71	50	49	42			45	42	47	44	SW	1	SW	2		5									13		
	14	29.53	50	29.41	48	49	42			47	44	43	39	SW	3	SW	2		10									14		
	15	29.59	47	29.82	45	44	34			37	35	37	34	SW	2	W.	1.5		3									15		
	16	29.89	45	29.71	47	45	36			40	36	44	39	SW	2	SW	6		10									16		
	17	29.63	48	29.80	48	46	39			45	42	42	39	SW	2	SW	1.5		10									17		
	18	29.64	47	29.38	47	46	39			43	39	41	38	S	3	SW	1.5		5									18		
	19	29.54	47	29.70	44	44	35			39	35	36	34	N	1.5	W	1		10									19		
	20	29.48	45	29.94	50	50	33			41	38	50	46	S	1.5	SW	6		10									20		
	21	29.36	48	29.33	49	51	39			41	37	42	39	SW	3	SW	3		0									21		
	22	29.09	47	29.51	47	46	36			39	36	37	35	SW	3	W.	1.5		5									22		
	23	29.86	44	29.62	48	48	32			35	32	48	45	W	1.5	SW	4		0								Frost 2°	23		
	24	29.54	51	29.58	51	53	46			49	47	51	48	SW	3	W.	3		10									24		
	25	29.75	53	29.75	55	55	48			52	49	49	46	SW	1.5	SW	5		5									25		
	26	29.69	54	29.51	55	53	47			50	46	48	45	SW	3	SW	5		10									26		
	27	29.38	54	29.28	55	53	47			50	45	50	45	SW	5	SW	6		3									27		
	28	29.36	50	29.18	50	50	40			43	40	48	44	SW	0.5	W	1.5		10									28		
	29	29.03	50	28.93	48	49	38			44	40	40	36	S.	2	SW	1.5		0									29		
	30																											30		
	31																											31		

NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	cirrus.	ns.	nebula.
ci-cu.	cirro-cumulus.	n.	nimbus.
ci-s.	cirro-stratus.	r.	rain.
cu.	cumulus.	h. r.	heavy rain.
cu-s.	cumulo-stratus.	c. h. r.	continued heavy rain.
d.	dew.	s.	sleet.
f.	fog.	sc.	scud.
fr.	frost.	sl.	sleet.
h-fr.	hoar-frost.	sn.	snow.
h.	haze.	so. h.	solar halo.
h. d.	heavy dew.	sq.	squall.
h. l.	hail.	sq.	squalls.
l.	lightning.	t.	thunder.
l. cl.	light clouds.	t.s.	thunder storm.
l. sh.	light showers.	w.	wind.
lu. co.	lunar corona.	w.	wind.
lu. ha.	lunar halo.	g.	gale of wind.

TABLE FOR ESTIMATING FORCE OF WIND.

Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.
0	Calm	1-5	Light breeze	4	Blowing hard
0.5	Very light air	2	Fresh breeze	5	Blowing agale
1	Light air	3	Very fresh	6	Violent gale

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction \pm for Temp. (Col. 2), = 29.512
"Corrected Mean" of Barometer at 9 P.M., minus the Correction \pm for Temp. (Col. 4), = 29.529
Mean at Station, corrected, and at 32°, = 29.520
Correction for height, feet, above Mean Sea-level, = 296
Mean, reduced to 32°, and Sea-level, = 29.816
Highest Reading, corrected for Index error, on the 11th, = 30.100
Lowest Do., Do., on the 1st, = 28.320
Difference, or Monthly Range, = 1.780

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 25th, = 54.7
Lowest in Month, corrected for Index errors, on the 3th, = 31.0
Difference, or Monthly Range, = 23.7
"Corrected Mean" of all the Highest, (Col. 5), = 47.2
"Corrected Mean" of all the Lowest, (Col. 6), = 38.8
Difference, or Mean Daily Range, = 8.4
Mean Temperature of Month, = 43.0
THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index errors), on the 11th, = 54.7
Mean, (Col. 7), of Black Bulb, Max. in Sun, = 54.7
Night, Black Bulb, (corrected for Index errors), on the 11th, = 54.7
"Corrected Mean" (Col. 8), of Black Bulb Min. on grass, = 54.7
Difference of above Means or Range ("exposed"), = 54.7

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 41.6
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 38.8
Computed Temperature of Dew-Point, = 35.4
Do. Elastic Force of Vapour, = 2.07
Do. Weight of Vapour in a Cubic Foot of Air, = 2.40
Relative Humidity, (Saturation = 100), = 80
RAIN fell on 20 Days; Amount in Inches, = 2.80

WIND.		SUMMARY.									
Direction	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	0	0	0	0	4	21	3	1	0	2.62	
P.M.	1	0	0	0	1	19	8	0	0	2.81	
Mean.	0	0	0	0	2	20	6	1	0	2.72	7.40

N.B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gunned or Fastened, and Forwarded by Book Post, prepaid.

Observations made and
Return verified by

(Signed)

Gerald Miller

Greatest daily range = 17.7° on the 9th

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS.

ONE of the objects of immediate importance that the "Scottish Meteorological Society" has proposed to itself, is to secure a *perfect uniformity* in the system of observation pursued at all its Stations. A certain degree of uniformity is absolutely necessary to justify the publication of Monthly Results from different observations; and it is found that differences between the Returns from any two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position or shelter of instruments, different hours of observation, or even from the use of differently constructed instruments. It is therefore hoped, that those persons who kindly furnish Reports to the Society will, by a scrupulous attention to the following Directions, secure for their Monthly Returns, an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, an entire comparableness among the several Returns, without which the Society's Reports must inevitably fail in achieving one of the main objects of Meteorological Observation.

Hour of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway Time only) twice a-day for some, and once (morning or evening) for other instruments, as specified, in the following remarks, or at the top of the schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading at what time it was taken, if not at 9 o'clock.

Barometer.—*Weather glasses* and *Aneroids*, though admirably adapted, as the latter certainly are, to indicate variations of atmospheric pressure, are not well fitted for scientific purposes. Nor can any Barometer be used for Meteorological Observations that is not supplied with such means of *adjustment or compensation* as will secure the height of the mercury in the tube being accurately measured from the fluctuating surface of the mercury in the cistern. It is also necessary that every Barometer shall have been compared with a *Standard*.

Two moderate-priced Barometers have been approved of by the Council; if properly tested and attended to, they are both well adapted to Meteorological purposes.

An excellent Barometer, as constructed by Mr. Altie of London, the use of which is attended with the great convenience of requiring *no adjustment* of the cistern. Its *scale-inches* are not true inches, but so adjusted as to *compensate* the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This form of instrument has been adopted by the Board of Trade, and has received the approval of the Meteorological Committee of the British Association. In another form, of the same principle, the cistern is of leather, and thus, by aid of a screw acting on the bottom, the surface of the contained mercury can be adjusted to the *zero-point* of the fixed scale; their coincidences being indicated by a little ivory float, whose stem passes freely through the lid and case of the cistern. When screws, to form one *straight line* with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this *preliminary* setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the *zenith*.

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must be screwed so as to form a tight plug to the cistern. Then *seize* up the mercury to within a quarter of an inch of the top of the tube, and take down the instrument; it may then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case when, on inclining the instrument so that the mercury strikes the top of the tube, a *slight tap* is produced. If this is prevented by air it may be removed to the cistern, and got rid of by inverting the Barometer (care being taken to prevent the loss of mercury by tightening the ivory plug, and gently tapping it); and if this plan fails, the instrument must be re-adjusted.

The Barometer should be suspended in a good *light*, which may be improved by putting a piece of white paper behind the tube. It must be perfectly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire.

In taking an *Observation*, the attached Thermometer is first noted; the tube must then be gently tapped and the cistern adjustment carefully made. By raising and lowering the eye, it must be brought into the plane of the back and front of the index,—usually the lower edge of the vernier, which must be carefully adjusted to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly; so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will greatly facilitate an accurate adjustment and reading of the Barometer.

Practice of Thermometers.—The Council of the Society recommend that Self-registering Thermometers and Hygrometers be enclosed in a box, painted white outside, and black within, and fixed 4 feet above grass in an exposed position, free from nearly local influences. The laths forming the sides and doors of the Boxes are arranged so as to "protect" the Thermometers, and to allow a complete ventilation of the interior. The instruments are suspended on cross-laths, in the centre of the Box, and face the door opening to the north. To accommodate a duplicate set of instruments, which is most desirable, doors are also made to open to the south. These Boxes may be had at the Society's Office.

Self Registering Thermometers.—Professor Phillips's, and Negretti and Zambra's Patent "Maximum" Thermometers are recommended: printed directions for their use may be obtained with each instrument. The "Minimum" Thermometer of Rutherford is recommended when graduated on the glass stem and affixed to a frame separate from the "Maximum". This Thermometer is liable to two derangements, both of which must be guarded against, and may be easily remedied by an observer. When the column of spirit breaks, it may be re-united by striking the instrument repeatedly against the palm of the hand; when part of the spirit distils by high temperature, it will be found in the upper lobe, and must be dislodged from thence by heating that part over a lamp; the alcohol will evaporate and again condense in contact with the body of the liquid. These instruments should be hung horizontally.

The above remarks apply equally to the Thermometers for

registering the greatest heat from the sun's rays, and the least from radiation during night. Their bulbs have a black coating, the greater or less obscuration of the sky *on-shed* (i. e., within 20° or 30° of the zenith). The strata of clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the clouds column, though their appearance and changes ought to be noted among the *Remarks*. The amount of cloud is entered from a scale of 0 to 10; thus, when the sky *overhead* is half covered by clouds, 5 is entered as the *observation*, and so on.

Observations of the clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—In the column "Velocity" and Direction, 2 W. (for example,) will indicate that the upper strata of clouds travel with *extreme* velocity from S.W., and those in the lower regions from W., with one-third the (*extreme*) speed of the former. Again, in the second "Cloud" column, an entry of 2, *cast*, (*eg.*) will indicate that the higher regions are covered to the "amount" of 4-tenths with *stratus* clouds; and that the sky is further obscured to the extent of 2-tenths by lower clouds of the *cumulo-stratus* kind.

Sunshine.—The number of hours in which objects in the sun's rays cast shadows, should be entered in the proper column. **Underground Thermometers.**—As the germination and health of crops and plants greatly depend on the temperature of the soil,—its amount and constancy,—the Council recommend that thermometers placed in the earth, their bulbs being sunk to 3, 12, and 22 inches, and the stems above ground protected from the sun's rays, and fitted with sloping tin collars, to prevent rain-water being conveyed to the bulbs by the stems or wooden frames. Mention must be made of the geological formation and agricultural condition of the soil in which these Thermometers are placed.

Temperature of the Sea.—A knowledge of the temperature of the sea is not only in itself, but in its relations to that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be carefully taken by a properly constructed apparatus, from the ends of piers and rocks round the coast, where it is not influenced by that of river water. At or near the time of high water, on the 5th, 15th, and 25th of each month, the thermometer ought to be sunk exactly six feet (one fathom), and after ten minutes have elapsed, drawn up and read. When convenient, extra sea observations might be taken for other and greater depths, nothing always the temperature of the air, and the hour of observation; and continuing to observe for particular depths.

Temperature of Wells.—The temperature of the water at the bottoms of wells ought, when practicable, to be taken, and the depth of the well and of the water noted. **Ozone.**—Mention whether Schönbain's or Meissner's papers are used. The paper is affixed by a pin to a board in the thermometer box, and the indication registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation in the following manner,—thus 3°, as an *ozone* entry in the schedule, will indicate that the ozone paper is tilted at 3° on the scale, that the wind is from the N.W., and that its force on the scale 0—10 is 4; i. e., that it is *blowing fresh*.

Electricity.—Too much importance cannot be attached to electric condition of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper Electrometer is necessary to every complete meteorological observatory. **Remarks.**—The "Remarks" column is too narrow, but unavoidable as some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are recognised and in use at Greenwich and Southampton, are given at the foot of the column. Besides special and extraordinary observations, great prominence ought to be given in this column to prevalent diseases, differences in character, colour, velocity, and direction between the lower and upper strata of clouds, the colour of the sky, etc. Remarks ought to be made on the occurrence of meteors, aurora borealis, remarkable depressions and elevations of the barometer, thunder storms, and remarkable falls of snow, hail, or rain, the hour of storms of wind attaining their maximum, as well as such notes on storms as have been limited at above. When lofty hills are in the vicinity of an Observatory, the height of clouds and of the snow-line in winter ought to be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. ought to be registered, either in two columns, otherwise unoccupied, or in two ruled off for the purpose, from that headed "Remarks." It is intended that observations by the Electrometer should be entered in this manner or on the side-margin. Additional remarks may be made on the margin. **Observations** in connection with the periodic return of the seasons, possess not only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena; that the published Summaries may fairly represent the whole of Scotland. Observation ought to be confined to individual trees and shrubs; to particular species of birds; and, in the case of crops, to specified sorts reared from year to year on the selected piece of ground or farm. The Council recommend that *term day* observations be taken;—viz., on the 21st days of March, June, September, and December. Full directions for the use of the instruments mentioned above have been printed, and may be had along with them from the makers.

The Council have agreed to recommend that observers, before purchasing new instruments, should communicate with the Meteorological Secretary; and they consider it desirable that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

(By Order) A. B.

EDINBURGH, 9th December 1865.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	CHIEF CROPS.	SWATHING OR MOWING VEGETABLES.	APPEARING ABOVE GROUND.	IN EAR OR FLOWER.	FIRST CUT
Alder,	Battle,	Barley,	Potatoes,	Wheat,	Barley,
Beech,	Chick,	Beans,	Peas,	Turnips,	Turnips,
Birch,	Grass,	Hay,	Hay,	Hay,	Hay,
Oak,	Plum,	Plum,	Plum,	Plum,	Plum,
Lime,	Apple,	Apple,	Apple,	Apple,	Apple,
Sycamore or Plane,	Black Currant,	Black Currant,	Black Currant,	Black Currant,	Black Currant,

SHRUBS, &c.	FRUITS.	FRUIT TREES.	FRUIT TREES.	FRUIT TREES.	FRUIT TREES.
Barberry,	Apple,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,
Broom,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Hawthorn,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Hazel,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Mountain Ash or Rowan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Rail or Corn Crake,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Starling,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swallow,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Robin,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Blackbird,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Magpie,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Jackdaw,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Parrot,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Peacock,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Guinea Fowl,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Hen,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Pheasant,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Partridge,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Quail,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Snipe,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Grouse,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Wild Duck,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Goose,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Swan,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Crane,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Stork,	Black Currant,	Cherry,	Gooseberry,	Gooseberry,	Gooseberry,
Albatross, . .					

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at March Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of March 1868.
The Hours of Observation are of Greenwich Time.

ELECTRICITY	Days of Month.	BAROMETER				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				WIND.				RAIN.		CLOUDS.				THERMOMETERS. under Ground.	SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
		Barometer. No.	Atmospheric Thermometer.	Barometer. No.	Atmospheric Thermometer.	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	Readings of the H Cup Anemometer No.	No. of hours in which it fell.	Amount in inches.	Velocity (0-10), and Direction.	Amount, (0-10), and Species.	Velocity (0-10), and Direction.						Amount, (0-10), and Species.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		inches.	inches.	inches.	inches.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.						No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction ++
for Temp. (Col. 2), = 29.511 - 0.53 = 29.458
"Corrected Mean" of Barometer at 9 P.M., minus the Correction ++
for Temp. (Col. 4), = 29.576 - 0.54 = 29.462
Mean at Station, corrected, and at 32°, = 29.460
Correction for height, feet, above Mean Sea-level, = 29.6
Mean, reduced to 32°, and Sea-level, = 29.756
Highest Reading, corrected for Index error, on the 28 th, = 30.230
Lowest Do., Do., on the 8 th, = 28.500
Difference, or Monthly Range, = 1.730

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 28 th, = 56.7
Lowest in Month, corrected for Index errors, on the th, = 28.0
Difference, or Monthly Range, = 28.7
"Corrected Mean" of all the Highest, (Col. 5), = 49.7
"Corrected Mean" of all the Lowest, (Col. 6), = 38.4
Difference, or Monthly Range, = 11.3
S.-R. THERMOMETER, Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =
"Corrected Mean" (Col. 8), of Black Bulb Min. on grass, =
Difference of above Means or Range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 43.0
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 39.8
Computed Temperature of Dew-Point, = 36.0
Do. Elastic Force of Vapour, = 2.11
Do. Weight of Vapour in a Cubic Foot of Air, = 2.46
Relative Humidity, (Saturation = 100), = 77
RAIN fell on 16 Days; Amount in Inches, = 2.20

WIND.												SUMMARY.		
Direction.	N	NE	E	SE	S	SW	W	NW	Calms or Variable.	Mean Force.	Mean Velocity in miles per day.	A		
A.M.	0	1	0	0	8	12	10	0	0	1.89				
P.M.	1	0	0	0	6	14	7	3	0	2.00				
Mean.	0	1	0	0	7	13	8	2	0	1.94	376.6			

N.B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gummed or Fastened, and Forwarded by Book Post, prepaid.

Observations made and
Returns verified by

(Signed) Donald Miller

Greatest daily Range = 20° on the 25th

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS.

ONE of the objects of immediate importance that the "Scottish Meteorological Society" has proposed to itself, is to secure a *perfect uniformity* in the system of observation pursued at all its Stations. A certain degree of uniformity is absolutely necessary to justify the publication of Monthly Results from different observations; and it is found that differences between the Returns from any two Stations so very considerable, as to render them quite incomparable, may arise from dissimilarity in the position or shelter of instruments, different hours of observation, or even from the use of differently constructed instruments. It is therefore hoped, that those persons who kindly furnish Reports to the Society will by a scrupulous attention to the following Directions, secure for their Monthly Returns an accuracy and value commensurate with the labour and pains involved in making them; and for the Tables published by the Society an edifying comparableness among the several Returns, without which, the Society's Reports must inevitably fail in achieving one of the main objects of Meteorological Observation.

Hour of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway Time only) twice a-day for some, and once (morning or evening) for other instruments, as specified, in the following remarks, or at the top of the schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading at what time it was taken, if not at 9 o'clock.

Barometer.—*Weather glasses* and *Aneroids*, though admirably adapted, as the latter certainly are, to indicate variations of atmospheric pressure, are not well fitted for scientific purposes. Nor can any Barometer be used for Meteorological Observations that is not supplied with such means of *adjustment* or *compensation* as will secure the height of the mercury in the tube being accurately measured from the fluctuating surface of the mercury in the cistern. It is also necessary that every Barometer shall have been compared with a *Standard*.

Two moderate-priced Barometers have been approved of by the Council; if properly tested and attended to, they are both well adapted to Meteorological purposes.

An excellent Barometer is constructed by Mr. Adie of London, the use of which is attended with the great convenience of requiring *no adjustment* of the cistern. Its *scale-tubes* are not true inches but so much shorter as to *compensate* the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This form of instrument has been adopted by the Board of Trade, and has received the approval of the Meteorological Committee of the British Association. In another form of the Barometer, the sides of the *cistern* are of leather, and thus by aid of a screw acting on the bottom, the surface of the contained mercury can be adjusted to the *zero-point* of the fixed scale; their consequences being indicated by a little ivory float, whose stem passes freely through the lid and case of the cistern. When the *index-line* on this little piston-rod is brought, by the adjusting screw, to *form one straight line* with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this *preliminary* setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the *cistern*; as a slight error removed from its fastenings, the ivory peg must be screwed so as to form a tight plug to the cistern. Then *raise up* the mercury to within a quarter of an inch of the top of the tube, and take down the instrument; it may then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case when, on inclining the instrument so that the mercury strikes the top of the tube, a *sharp tap* is produced. If this is prevented by air it may be removed to the cistern, and got rid of, by inverting the Barometer (care being taken to prevent the loss of mercury by tightening the ivory peg), and gently tapping it; and if this plan fails, the instrument should be repaired.

The Barometer should be suspended in a good *light*, which may be improved by putting a piece of white paper behind the tube. It must be perfectly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire.

In *taking an Observation*, the attached Thermometer is first noted; the tube must then be gently tapped and the cistern-adjustment carefully made. By raising and lowering the eye, it must be brought into the plane of the back and front of the index,—usually the lower edge of the vernier, which must be carefully adjusted to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly; so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will greatly facilitate an accurate adjustment and reading of the Barometer.

Protection of Thermometers.—The Council of the Society recommend that Self-registering Thermometers and Hygrometers be enclosed in a Box, painted white outside, and black within, and fixed 4 feet above grass in an exposed position, free from merely local influences. The laths forming the sides and doors of the Boxes are arranged so as at once to "protect" the Thermometers, and to allow a complete ventilation of the interior. The instruments are suspended on cross-laths, in the centre of the Box, and face the door opening to the north. To accommodate a duplicate set of instruments, which is most desirable, the doors are also made to open to the south. These Boxes may be had at the Society's Office.

Self-Registering Thermometers.—Professor Phillips's, and Negretti and Zamboni's Patent "*Maximum*" Thermometers are recommended; printed directions for their use may be obtained with each instrument. The "*Minimum*" Thermometer of Rutherford is recommended when graduated on the glass stem and affixed to frames separate from the "*Maximum*." This Thermometer is liable to two derangements, both of which must be guarded against, and may be easily remedied by an observer. When the *columns* of spirit breaks, it may be re-united by striking the instrument repeatedly against the palm of the hand; when part of the spirit distils by high temperature, it will be found in the upper lobe, and must be dislodged from thence by heating that part over a lamp; the alcohol will evaporate and again condense in contact with the body of the liquid. These instruments should be hung horizontally.

The above remarks apply equally to the Thermometers for

registering the greatest heat from the sun's rays, and the least amount of cloud in the atmosphere ought to be estimated from the greater or less observation of the sky *on a level* (i. e., within 30° or 30' of the zenith). The strata of clouds that appear near the horizon are viewed obliquely; and thus being unable to judge of their amount, we ought not to take them into account in the *clouds* column, though their appearance and changes ought to be noted among the "*Remarks*." The amount of cloud is entered on a scale of 0 to 10; thus, when the sky *on a level* is *half covered* by clouds, 5 is entered as the *description* and so on.

Observations of the clouds recorded at 9 A.M. and at sunset, as illustrating the conflict and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner;—In the column "*Velocity*" and "*Direction*," 2, W. (for example,) will indicate that the upper stratum of clouds travel with *extreme* velocity from S.W., and those in the lower regions from W., with one-third the (*extreme*) speed of the former. Again, in the second "*Cloud*" column, an entry of $\frac{2}{4}$, (e.g.) will indicate that the higher regions are covered to the "amount" of 4-tenths with *stratus* clouds; and that the sky is further obscured to the extent of 2-tenths by lower clouds of the *cumulo-stratus* kind.

Sunshine.—The number of hours in which objects in the sun's rays cast shadows, should be entered in the proper column. **Underground Thermometers.**—As the germination and health of crops and plants greatly depend on the temperature of the soil,—its amount and constancy,—the Council recommend that observations in this interesting department be made at 9 A.M., by thermometers placed in the earth, their bulbs being sunk to 3, 12, 15th, and 25th of each month, the thermometer ought to be sunk exactly six feet (one fathom), and after ten minutes have elapsed, drawn up and read. When convenient, extra sea observations might be taken for other and greater depths, noting always the temperature of the air, and the hour of observation; and continuing to observe for particular depths.

Temperature of the Sea.—A knowledge of the temperature of the sea is not only in itself, but in its relations to that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be carefully taken by a properly constructed apparatus, from the ends of piers and rocks round the coast, where it is not influenced by that of river water. At or near the time of high water, on the 5th, 15th, and 25th of each month, the thermometer ought to be sunk exactly six feet (one fathom), and after ten minutes have elapsed, drawn up and read. When convenient, extra sea observations might be taken for other and greater depths, noting always the temperature of the air, and the hour of observation; and continuing to observe for particular depths.

Benignity of Wills.—The temperature of the water at the bottoms of wells ought, when practicable, to be taken, and the depth of the well and of the water noted.

Ozone.—Mention whether Schönbien's or Moffat's papers are used. The paper is affixed by a pin to a board in the thermometer box, and the indication registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 3°, as an *ozone* entry in the schedule, will indicate that the ozone paper is turned as "3°" on the scale 0—6 is "4°"; i. e., that it is *blowing fresh*.

Electricity.—Too much importance cannot be attached to electric condition of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper Electrometer is necessary to every complete meteorological observatory.

Remarks.—The "*Remarks*" column is too narrow, but unavoidable so. Some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are recognised and in use at Greenwich and Southampton, are given at the foot of the column. Besides special and extraordinary observations, great prominence ought to be given in this column to prevalent diseases, differences in character, colour, velocity, and direction between the lower and upper strata of clouds, the colour of the sky, etc. Remarks ought to be made on the occurrence of meteors, aurora borealis, remarkable depressions and elevations of the barometer, thunder storms, and remarkable falls of snow, hail, or rain, the hour of storms of wind attaining their maximum, as well as such notes on storms as have been hinted at above. When lofty hills are in the vicinity of an Observatory, the height of clouds and of the snow-line in winter ought to be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. ought to be registered, either in two columns, either wise unoccupied, or in two ruled off for the purpose, from that headed "*Remarks*." It is intended that observations by the Electrometer should be entered in this manner or on the side-margin. Additional remarks may be made on the margin.

Observations in connection with the periodic return of the seasons. possesses not only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena; that the published Summaries may fairly represent the whole of Scotland. Observation ought to be confined to individual trees and shrubs; to particular species of birds; and in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm.

The Council recommend that *term day* observations be taken;—viz., on the 21st days of March, June, September, and December.

Full directions for the use of the instruments mentioned above have been printed, and may be had along with them from the makers.

The Council have agreed to recommend that observers, before purchasing new instruments, should communicate with the Meteorological Secretary; and they consider it desirable that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

(By Order) A. B.

Edinburgh, 24th December 1867.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	ALDER.	BEECH.	BIRCH.	ELM.	LARCH.	LIME.	OAK.	Sycamore or Plane.
In flower.								
First in bloom.								
In leaf.								
Devised of leaves.								
CROPS.								
Sowing or planting.								
Harvesting or above ground.								
In flower or leaf.								
First Cut or blanch.								

SHRUBS, ETC.	BARBERRY.	BOUTREE or Elder.	BROOM.	Hazel.	Hawthorn.	Holly.	Laburnum.	Lime.	Mazeton.	Mountain Ash or Rowan.	Red Flowering Currant.	Rhododendron Ponticum.	Whin.
First in bloom.													
In flower.													
First in leaf.													
Devised of leaves.													
CROPS.													
Sowing or planting.													
Harvesting or above ground.													
In flower or leaf.													
First Cut or blanch.													

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

BOOK-POST.

Mr ALEXANDER BUCHAN,

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

Edinburgh
March 1868.

WITH REMARKS ON THE USE OF INSTRUMENTS.

The above remarks apply equally to the Thermometers for

Snow-falls may, for convenience, be registered in the rain column, under the following conditions:—when a Snow shower occurs it must be noted in the "Remarks," and the letter S affixed to the depth of water received in gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the rain-gauge. For wind, rain, and snow, as indicated in every column, the observer cannot be too careful to make *observations only*; and nothing that pertains of the nature of deduction inference.

Clouds.—Convenient abbreviations for T. L. Howard's

WITH REMARKS ON THE USE OF INSTRUMENTS.

(Br. Oulev)

FOREST TREES.	In flower.	Leaf first appear.	In leaf.	Diseased or Leaves.	CROPS mentioning variety.
Alder,					Barley,
Ash,					Bare or Bigg,
Beech,					(Oats,
Birch,					Wheat,
Elm,					Beans,
Larch,					Potatoes,
Linæ,					Turnips,
Oak,					Rye Grass,
Sycamore or Plane,					

SHRUBS, ETC.		FRUITS.		NIGRATORY WINDS.	
Barberry,	Apple,	Cuckoo,	First in Blossom.	First in Blossom.	First in Blossom.
Broom,	Black Currant,	Curlew,	First in Blossom.	First in Blossom.	First in Blossom.
Boulevard or Elder,	Cherry,	House-Sparrow,	First in Blossom.	First in Blossom.	First in Blossom.
Hazel,	Gean,	Lapwing,	First in Blossom.	First in Blossom.	First in Blossom.
Hawthorn,	Gooseberry,	Plover,	First in Blossom.	First in Blossom.	First in Blossom.
Holly,	Peach,	Starling,	First in Blossom.	First in Blossom.	First in Blossom.
Laburnum,	Pear,	Swamp,	First in Blossom.	First in Blossom.	First in Blossom.
Linac,	Plum,	Swamp,	First in Blossom.	First in Blossom.	First in Blossom.
Myrtle,	Strawberry,	Swamp,	First in Blossom.	First in Blossom.	First in Blossom.
Mountain Ash or Rowan,		Swamp,	First in Blossom.	First in Blossom.	First in Blossom.
Red Flowering Currant,		Swamp,	First in Blossom.	First in Blossom.	First in Blossom.
Rhododendron Ponticum,		Swamp,	First in Blossom.	First in Blossom.	First in Blossom.
Whin,		Swamp,	First in Blossom.	First in Blossom.	First in Blossom.

turnips, fruits, etc., whether plentiful, or in perfection; whether any have suffered from blight, diseases, etc. Whether, Epizootics, Epidemics, etc., and the Agricultural condition of the district generally.

To

Mr ALEXANDER BUCHAN.

Secretary of the Meteorological Society of Scotland.

EDINBURGH.

BOOK-POST.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at March Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.

Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet.

During the MONTH of May 1868

The Hours of Observation are of Greenwich Time.

BAROMETER,	“Corrected Mean” at 9 A.M., <i>minus</i> the Correction $\frac{+1}{1}$	
	for Temp. (Col. 2), = $29.657 \dots - 0.77 \dots$	= 29.572
	“Corrected Mean” of Barometer at 9 P.M., <i>minus</i> the Correction $\frac{+1}{1}$	
	for Temp. (Col. 4), = $29.650 \dots - 0.77 \dots$	= 29.573
Mean at Station, corrected, and at 32°,		= 29.572
Correction for height, feet, above Mean Sea-level,		= 296
Mean, reduced to 32°, and Sea-level,		= 29.868
Highest Reading, corrected for Index error, on the 5 th ,		= 30.030
Lowest Do., Do., on the 23 th ,		= 29.070
Difference, or Monthly Range ,		= 0.960

S.-R. THERMOMETER, (in shade, etc.), **Highest in Month,** (corrected for Index Errors), on the 29 th, = 72.7

Lowest in Month, corrected for Index errors, on the 6 th, = 32.0

Difference, or **Monthly Range,** = 40.7

“ **Corrected Mean** ” of all the **Highest,** (Col. 5), = 60.4

“ **Corrected Mean** ” of all the **Lowest,** (Col. 6), = 45.9

Difference, or **Mean Daily Range,** = 14.5

** Calculated **Mean Temperature** of Month, = 53.2

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected, for	
Index errors), on the	th,
" Corrected Mean, " (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the	th, ... =
" Corrected Mean " (Col. 8), of Black Bulb Min. on grass,	
Difference of above Means or Range ("exposed"),	

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb , (Cols. 9 and 11),	=	52.0
Mean (corrected) A.M. and P.M. Reading of Wet Bulb , (Cols. 10 and 12),	=	47.8
## Computed Temperature of Dew-Point ,	=	43.5
## Do. Elastic Force of Vapour ,	=	28.3
## Do. Weight of Vapour in a Cubic Foot of Air ,	=	3.24
## Relative Humidity , (Saturation = 100),	=	73.
RAIN fell on 16 Days ; Amount in Inches,	=	1.60

WIND.		SUMMARY.									
Direction	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	1	0	4	1	9	12	3	1		1.68	
P.M.	2	4	1	2	14	3	5	0		1.81	
Mean.	2	2	2	2	12	7	4	0		1.74	= 3.03 ll.

Observations made and
Return verified by

(Signed) Donald Miller

Greatest daily range = $26^{\circ}0'$ on the 29th

WITH REMARKS ON THE USE OF INSTRUMENTS.

How of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway Time only) twice a-day for some, and once (morning or evening) for other instruments, as specified, in the following remarks, or at the top of the schedule. It is hoped that the remarks, promulgated in the time of reading the instruments will be unobscured. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading at what time it was taken, if not at 9 o'clock.

Barometer.—Whether *glass* and *anthers*, though admirably adapted, as the latter commonly are, to indicate variations in atmospheric pressure, are not well fitted for scientific purposes. Nor can any Barometer be used for Meteorological Observations, which is not supplied with such means of *adjustment or compensation* as will secure the height of the mercury in the tube being accurately measured from the fluctuating surface of the mercury in the cistern. It is also necessary that every Barometer shall have been compared with a *Standard*.

When a Barometer having adjoined surfaces has to be removed from its fastenings the ivory peg must be screwed so as to form a tight plug to the cistern. Then *screw* up the mercury to a quarter of an inch of the top of the tube, and take down the instrument; it may then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case when, on inclining the instrument so that the mercury strikes the top of the tube, a *sharp tap* is produced. If this is prevented by air it may be removed to the cistern, and got rid of, by inverting the Barometer (care being taken to prevent the loss of mercury by whitening the ivory peg), and gently tapping it; and if this plan fails, the instrument must be repaired.

The Barometer should be suspended in a good *light*, which may be improved by putting a piece of white paper behind the tube. It must be perfectly perpendicular, and exposed to neither the sun's direct rays nor the least of a fire.

Protection of Self-registering Thermometers. The Council of the Society recommend that Self-registering Thermometers and Hygrometers be enclosed in a Box, painted white outside, and black within, and fixed 4 feet above grass in an exposed position, free from any shelter, and so placed as to be free from any direct solar radiation, and free from any local influences. The laths forming the sides and doors of the Boxes are arranged so as at once to "protect" the thermometers, and to allow a complete ventilation of the interior; the instruments are suspended on cross-laths, in the centre of the Box; and face the door opening to the north. To accommodate a duplicate set of instruments, which is most desirable, the boxes are also made to open to the south. These Boxes may be ordered from the Society's Office.

Self Registering Thermometers.—Professor Phillips's, and Zambra's Patent "*Maximum*" Thermometers, are recommended; printed directions for their use may be obtained with each instrument. The "*Minimum*" Thermometer of the same make is recommended when graduated on the glass scale, and affixed to a frame separate from the "*Maximum*." This thermometer is liable to two arrangements, both of which must be guarded against, and may be easily remedied by an observer. When the column of spirit breaks, it may be re-unioned by striking the instrument repeatedly against the palm of the hand; when the column of spirit distils by high temperature, it will be found in the upper globe, and must be dislodged from thence by heating it at part over a lamp; the alcohol will evaporate and again condense in contact with the body of the liquid. These instruments should be hung horizontally.

The above remarks apply equally to the Thermometers for

as illustrating the condition and contents of the upper and lower regions of the atmosphere. The gurgles in the schedule are to be made in the following manner:—In the column "Velocity" (i. S. W.) and Direction" (2. W.) (for example) will indicate that the "upper" strata of clouds travel with *extreme* velocity from S. W., and these in the lower regions from W., with one-third the (*extreme*) speed of the former. Again, in the second "Cloud" 4. st.

Temperature of the Sea.—Knowledge of the temperature of the sea is not only in itself, but in its relations to that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be carefully taken by a properly constructed apparatus, from the ends of piers and rocks round the coast, where it is not influenced by the wind or near the shore. The thermometers used should be of the kind used by the Admiralty, and the observations taken at least twice daily, namely, six feet (one fathom) and after ten minutes have elapsed, drawn up and read. When convenient, extra sea observations should be taken for other and greater depths, nine always

Electricity.—Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper Electrometer is necessary to every complete meteorological observatory.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. ought to be registered, either in two columns, otherwise unoccupied, or in two ruled off for the purpose, so that the observer need not be troubled with "Remarks." It is intended that observations by the Electrometer should be entered in this manner or by the side of the "Remarks" column, so that the observer may be enabled to make additional remarks may be made on the margin.

Observations in connection with the periodic return of the "Observations," possess not only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena; that the published Summaries may fairly represent the whole of Scotland. Observations ought to be confined to individual trees and shrubs; to particular species of birds; and, in the case of crops, to specified sorts reared from year to year in a selected piece of ground or farm.

The Council recommend that *term day* observations be taken;—*viz.*, on the 21st days of March, June, September, and December.

Full directions for the use of the instruments mentioned above have been printed, and may be had along with them from the makers.

The Council have agreed to recommend that observers, before purchasing new instruments, should communicate with the Meteorological Secretary; and they consider it desirable that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

By Order) A. B.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.		In Flower.		In Leaf buds first appear.		In Leaf.		Diseased or Leaves.		CROPS mounting variety.		Planting.		Appearing or above ground.		In Leaf First Col.	
Alder.										Barley.							
Ash.										Bee or Bigger.							
Beech.										Oats.							
Birch.										Wheat.							
Elm.										Beans.							
Larch.										Potatoes.							
Yew.										Turnips.							
Sycamore or Plane.										Rye Grass.							

[illegible]

BOOK-POST.

Secretary of the Meteorological Society of Scotland.

EDINBURGH.

Mr ALEXANDER BUCHAN.

To

Erindorff
May 1868.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at March Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of June 1868.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No.				WIND.				RAIN.		CLOUDS.				THERMOMETERS. under Ground.	SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms began and ended.</i>	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of Anemometer No.	No. of hours in which it fell.	Amount in inches. No.	9 A.M.		P.M.						SUNSHINE. Hours.	9 h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		Barometre * No.	Attach- ed Ther- mometer	Barometre. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direc- tion.	Force.	Direc- tion.	Force.				Velocity, (0-10), and Direc- tion.	Amount, (0-10), and Species.	Velocity, (0-10), and Direc- tion.							Amount, (0-10), and Species.	No. 3 inches.	No. 12 inches.	No. 22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
																																		0-10.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
																																		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°

NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	cirrus.	ms.	mesos.
ci. cu.	cirro-cumulus.	n.	nimbus.
cl. s.	cirro-stratus.	r.	rain.
cu.	cumulus.	h. r.	heavy rain.
cu. s.	cumulo-stratus.	c. h. r.	continued heavy rain.
d.	dew.	s.	stratus.
f.	fog.	sc.	scud.
fr.	frost.	sl.	sleet.
h. fr.	hoar-frost.	sn.	snow.
h.	haze.	so. h.	solar halo.
h. d.	heavy dew.	sq.	squall.
h.	hail.	sg.	squalls.
l.	lightning.	t.	thunder.
li. cl.	light clouds.	ts.	thunder storm.
li. sh.	light showers.	w.	wind.
li. co.	lunar corona.	g.	gale of wind.
li. h.	lunar halo.		

TABLE FOR ESTIMATING FORCE OF WIND.

Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.
0	Calm	1-5	Light breeze	4	Blowing hard
0.5	Very light air	2	Fresh breeze	5	Blowing a gale
1	Light air	3	Very fresh	6	Violent gale

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction \pm = 29.703
for Temp. (Col. 2), 29.790..... - 0.87.....

"Corrected Mean" of Barometer at 9 P.M., minus the Correction \pm = 29.714
for Temp. (Col. 4), 29.862..... - 0.88.....

Mean at Station, corrected, and at 32°, = 29.708

Correction for height, feet, above Mean Sea-level, = 296

Mean, reduced to 32°, and Sea-level, = 30.004

Highest Reading, corrected for Index error, on the 30th, = 30.140

Lowest Do., Do., on the 22th, = 29.360

Difference, or Monthly Range, = 0.780

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 20th, = 78.7

Lowest in Month, corrected for Index errors, on the 18th, = 42.0

Difference, or Monthly Range, = 36.7

"Corrected Mean" of all the Highest, (Col. 5), = 65.1

"Corrected Mean" of all the Lowest, (Col. 6), = 49.6

Difference, or Mean Daily Range, = 15.5

* Calculated Mean Temperature of Month, = 57.4

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected, for Index errors), on the th, =

"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =

Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =

"Corrected Mean" (Col. 8), of Black Bulb Min. on grass, =

Difference of above Means or Range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry

Bulb, (Cols. 9 and 11), = 55.1

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols.

10 and 12), = 50.6

† Computed Temperature of Dew-Point, = 46.3

† Do. Elastic Force of Vapour, = 3.15

† Do. Weight of Vapour in a Cubic Foot of Air, = 3.57

† Relative Humidity, (Saturation = 100), = 72

RAIN fell on 9 Days; Amount in Inches, = 0.30

WIND.		SUMMARY.									
Direction		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		2	3	0	3	7	5	16	0	0	1.83
P.M.		2	1	2	0	4	6	14	1	0	1.67
Mean.		2	2	1	2	2	8	15	0	0	1.76 = 3.106

N.B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gunned or Fastened, and Forwarded by Book Post, prepaid.

Observations made and
Return verified by

(Signed)

Donald Miller

Greatest daily range = 32.0 on the 20th

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at March Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level 270 feet, above Ground _____ feet. During the MONTH of July 1868.
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				WIND.				RAIN.		CLOUDS.				SUNSHINE. Hours.	THERMOMETERS. under Ground.			SEA. Temperature at Surface and Depth.	OZONE. 0-10.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the F. Cup Anemometer No.		No. of hours in which it fell.	Amount in inches. No.	9 A.M.			P.M.		No. 3 inches.					No. 12 inches.	No. 22 inches.	Temperature of WELL at Depth of feet. No.	9 A.M.	9 P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		Baromet. * No.	Atmos- phere No.	Baromet. No.	Atmos- phere No.	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direc- tion.	Force.	Direc- tion.	Force.	0 h. A.M.	Velocity, (0-9), and Direc- tion.			Amount, (0-10), and Species.	Velocity, (0-10), and Direc- tion.		Amount, (0-10), and Species.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
																										9 h. A.M.											9 h. P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
																										inches.											inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\dagger\dagger$ for Temp. (Col. 2), = 29.725
"Corrected Mean" of Barometer at 9 P.M., minus the Correction $\dagger\dagger$ for Temp. (Col. 4), = 29.730
Mean at Station, corrected, and at 32", = 29.728
Correction for height, feet, above Mean Sea-level, = 29.6
Mean, reduced to 32", and Sea-level, = 30.024
Highest Reading, corrected for Index error, on the 24th, = 30.190
Lowest Do., Do., on the 28th, = 29.230
Difference, or Monthly Range, = 0.960

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 15th, = 85.7
Lowest in Month, corrected for Index errors, on the 24th, = 47.0
Difference, or Monthly Range, = 38.7
"Corrected Mean" of all the Highest, (Col. 5), = 70.6
"Corrected Mean" of all the Lowest, (Col. 6), = 53.7
Difference, or Mean Daily Range, = 16.9
** Calculated Mean Temperature of Month, = 62.2

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected, for Index errors), on the _____th, = _____
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = _____
Lowest at Night, Black Bulb, (corrected for Index errors), on the _____th, = _____
"Corrected Mean" (Col. 8), of Black Bulb Min. on grass, = _____
Difference of above Means or Range ("exposure"), = _____

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 60.4
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 56.4
† Computed Temperature of Dew-Point, = 52.9
† Do. Elastic Force of Vapour, = 4.07
† Do. Weight of Vapour in a Cubic Foot of Air, = 4.48
† Relative Humidity, (Saturation = 100), = 76
RAIN fell on 7 Days; Amount in Inches, = 0.20

WIND.	SUMMARY.									
	Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.
A.M.		2	5	4	1	0	7	2	0	
P.M.		5	7	1	1	5	6	5	1	
Mean.		4	6	2	1	2	6	9	1	0

N.B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gunned or Fastened, and Forwarded by Book Post, prepaid.

Observations made and
Return verified by

(Signed)

Donald Miller

Greatest daily range = 32.7 on the 15th.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Church Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of August

The Hours of Observation are of Greenwich Time.

BAROMETER, "corrected Mean" at 9 A.M., <i>minus</i> the Correction ++		
for Temp. (Col. 2), = 29.577	-	0.061
		= 29.483
Corrected Mean " of Barometer at 9 P.M., <i>minus</i> the Correction ++		
for Temp. (Col. 4), = 29.583	-	0.061
		= 29.488
Mean at Station, corrected, and at 32',		29.486
Correction for height, feet, above Mean Sea-level,	=	0.296
		29.782
Mean, reduced to 32', and Sea-level,	=	
Highest Reading, corrected for Index error, on the 1 th,	=	29.920
lowest Do., Do., on the 22 th,	=	28.980
Difference, or Monthly Range,	=	0.940

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the <u>5</u> th,	= <u>87.7</u>
Lowest in Month, corrected for Index errors, on the <u>26</u> th,	= <u>48.0</u>
Difference, or Monthly Range,	= <u>39.7</u>
" Corrected Mean " of all the Highest, (Col. 5),	= <u>66.8</u>
" Corrected Mean " of all the Lowest, (Col. 6),	= <u>52.9</u>
Difference, or Mean Daily Range,	= <u>13.9</u>
** Calculated Mean Temperature of Month,	= <u>59.8</u>

S.-R. THERMOMETER, Black Bulb in Sun, Highest,	(corrected, for	
Index errors), on the	th, =
" Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun,	 =
Lowest at Night, Black Bulb, (corrected for Index errors), on the	th, =
" Corrected Mean " (Col. 8), of Black Bulb Min. on grass,	 =
Difference of above Means or Range (" exposed "),	 =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11),..... = 58.6

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols.
10 and 12), = 54.5

Computed **Temperature of Dew-Point**,..... = 50.8
Do. **Elastic Force of Vapour**..... = 1.2452

Do. Weight of Vapour in a Cubic Foot of Air, = 4.19

Relative Humidity, (Saturation = 100), = 76

IN fell on 16 Days: Amount in Inches. = 1.55

RAIN fell on 16 Days; Amount in Inches, = ~~4.40~~ 5.40

WIND.	SUMMARY.											
Direction	N	NE	E	SE	S	SW	W	NW	Caliber or Variable.	Mean Force.	Mean Velocity in miles per day.	
A.M.	3	3	5	0	7	3	10	0	0	1.77		
P.M.	0	6	5	0	4	10	6	0	0	1.87		
Mean.	2	4	5	0	6	6	8	0	0	1.82	= 3.50	

Observations made and
Return verified by

(Signed).

Donald Miller

Greatest daily range = 26.7 on 2-2

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Murch Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of September 1868.
The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS. under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms began and ended.	Days of Month.
	9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.		9 h. A.M.								
	Baromete No.	Atmosph. Thermometer	Baromete No.	Atmosph. Thermometer	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	Velocity, (0—10), and Direction.	Amount, (0—10), and Species.	Velocity, (0—10), and Direction.	Amount, (0—10), and Species.	No. 8 inches.	No. 12 inches.	No. 22 inches.						
	Inches.	Inches.	Inches.	Inches.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.				
1	29.67	61	29.81	63	61	53			57	54	56	53	h	3	h	1.5			10							1			
2	29.95	64	29.90	64	70	51			60	56	59	59	h	1	h	0.5			5							2			
3	29.74	63	29.80	65	70	51			59	57	57	55	h	2	h	1			10							3			
4	29.76	60	29.74	66	68	45			55	53	61	58	h	1	h	3			10							4			
5	29.82	69	29.88	68	74	58			67	61	64	59	h	2	h	0.5	0.1		3							5			
6	29.89	78	29.77	71	82	58			66	63	65	62	h	1.5	h	0.5			5							6			
7	29.76	72	29.81	65	77	51			68	64	54	50	h	1.5	h	1.5			10							7			
8	30.00	62	30.13	60	61	45			52	48	47	44	h	1.5	h	0.5			0							8			
9	30.19	60	30.10	61	64	41			51	47	48	46	h	0.5	h	0.5			3							9			
10	29.80	60	29.83	64	66	46			58	54	58	55	h	0.5	h	1			7							10			
11	29.83	61	29.88	61	58	49			57	53	51	49	h	2	h	2	0.1		10							11			
12	29.90	58	29.94	67	54	42			49	43	46	48	h	1.5	h	1			5							12			
13	29.93	66	29.84	56	55	43			50	46	46	43	h	2	h	0.5			3							13			
14	29.80	53	29.84	55	51	42			48	44	50	46	h	2	h	1.5			10							14			
15	29.82	55	29.80	56	55	45			50	46	50	45	h	2	h	2			10							15			
16	29.75	54	29.68	54	53	46			50	47	49	47	h	0.5	h	1.5			10							16			
17	29.61	54	29.56	54	53	46			50	46	50	47	h	2	h	1			10							17			
18	29.84	55	29.84	57	56	47			53	47	58	53	h	1.5	h	2.8			10							18			
19	29.47	57	29.46	57	55	51			54	53	54	52	h	4	h	4	0.8		10							19			
20	29.33	59	29.52	60	63	51			56	54	58	56	h	6	h	2			10							20			
21	29.57	62	29.63	60	62	53			59	56	55	53	h	1.5	h	1.5			10							21			
22	29.63	59	29.59	59	57	51			54	53	52	51	h	2	h	1.5			10							22			
23	29.43	59	29.32	58	56	49			54	50	53	51	h	2	h	1.5			10							23			
24	29.33	56	29.35	55	58	49			53	50	50	48	h	1.5	h	1.5			10							24			
25	29.40	56	29.27	53	55	45			51	48	52	48	h	2	h	1.5			5							25			
26	29.36	52	29.35	53	54	45			49	47	48	46	h	1	h	1.5	2.7		10							26			
27	29.14	54	28.97	55	60	46			56	54	50	48	h	1.5	h	1.5			10							27			
28	28.94	56	28.00	55	60	48			54	51	52	50	h	1.5	h	1.5			10							28			
29	28.77	57	28.77	55	60	47			55	53	49	48	h	1	h	1			10							29			
30	28.95	54	29.37	52	53	43			50	49	46	41	h	2	h	4	1.0		10							30			
31																										31			

NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	" cirrus.	ms.	" meteors.
ci-en.	" cirro-cumulus.	h.	" hail.
ci-s.	" cirro-stratus.	r.	" rain.
cu.	" cumulus.	h. r.	" heavy rain.
cu-s.	" cumulo-stratus.	c. h. r.	" continued heavy rain.
d.	" dew.	s.	" sleet.
f.	" fog.	sc.	" snow.
fr.	" frost.	sq.	" squall.
h. fr.	" hoar-frost.	sq. s.	" squally.
h.	" haze.	so. h.	" solar halo.
h. d.	" heavy dew.	sq. s.	" squally.
h. l.	" hail.	sq. s.	" squally.
l.	" lightning.	t.	" thunder.
li. cl.	" light clouds.	t. s.	" thunder storm.
li. sh.	" light showers.	w.	" wind.
li. co.	" lunar corona.	w. s.	" wind squall.
li. ha.	" lunar halo.	g.	" gale of wind.

TABLE FOR ESTIMATING FORCE OF WIND.

Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.
0	Calm	1.5	Light breeze	4	Blowing hard
0.5	Very light air	2	Fresh breeze	5	Blowing a gale
1	Light air	3	Very fresh	6	Violent gale

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction \pm = 29.568
for Temp. (Col. 2), = 29.568 - 0.01 = 29.558
Corrected Mean" of Barometer at 9 P.M., minus the Correction \pm = 29.576
for Temp. (Col. 4), = 29.576 - 0.01 = 29.566
Mean at Station, corrected, and at 32°, = 29.572
Correction for height, feet, above Mean Sea-level, = 0.296
Mean, reduced to 32°, and Sea-level, = 29.868
Highest Reading, corrected for Index error, on the 9 th, = 30.190
Lowest Do., Do., on the 29 th, = 28.770
Difference, or Monthly Range, = 1.420

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 6 th, = 81.7
Lowest in Month, corrected for Index errors, on the 9 th, = 42.0
Difference, or Monthly Range, = 39.7
Corrected Mean" of all the Highest, (Col. 5), = 60.5
Corrected Mean" of all the Lowest, (Col. 6), = 48.9
Difference, or Mean Daily Range, = 11.6
** Calculated Mean Temperature of Month, = 54.7

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected, for Index errors), on the th, =
Corrected Mean, (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =
Corrected Mean" (Col. 8), of Black Bulb Min. on grass, =
Difference of above Means or Range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 53.3
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 50.6
Computed Temperature of Dew-Point, = 47.9
Do. Elastic Force of Vapour, = 33.53
Do. Weight of Vapour in a Cubic Foot of Air, = 3.75
Relative Humidity, (Saturation = 100), = 82
RAIN fell on 18 Days; Amount in Inches, = 4.70

WIND.		SUMMARY.									
Direction		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		4	9	2	4	3	2	4	2	0	1.78
P.M.		3	6	6	1	3	4	3	0	0	1.53
Mean.		4	8	4	2	3	3	4	2	0	1.66 = 2.76

B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gummed or Fastened, and Forwarded by Book Post, prepaid.

Observations made and
Return verified by

(Signed) Donald Miller

Greatest daily range = 24.7 on 7th

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS.

ONE of the objects of immediate importance that the "Scottish Meteorological Society" has proposed to itself, is to secure a *uniformity* in the system of observation pursued at all its Stations. A certain degree of uniformity is absolutely necessary to justify the publication of Monthly Results from different observations; and it is found that differences between the Returns from any two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position or shelter of instrument, from different hours of observation, or even from the use of differently constructed instruments, or from the use of different observers. It is therefore hoped, that those persons who kindly furnish Reports to the Society will by a scrupulous attention to the following Directions, secure for their Monthly Returns an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, an entire comparableness among the several Returns, without which the Society's Reports must inevitably fall in relieving one of the main objects of Meteorological Observation.

Hour of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway Time) only twice a-day for some, and once (morning or evening) for other instruments, as specified, in the following remarks, or at the top of the schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading at what time it was taken, if not at 9 o'clock.

Barometer.—*Weather glasses* and *Aneroids*, though admirably adapted, as the latter certainly are, to indicate variations of atmospheric pressure, are not well fitted for scientific purposes. Nor can any Barometer be used for Meteorological Observations that is not supplied with such means of *adjustment* or *compensation*, as will secure the height of the mercury in the tube being accurately measured from the fluctuating surface of the mercury in the cistern. It is also necessary that every Barometer shall have been compared with a *Standard*.

Two moderate-temperature Barometers have been approved of by the Council; if properly tested and attended to, they are well adapted to Meteorological purposes.

An excellent Barometer is constructed by Mr. Adie of London, the use of which is attended with the great convenience of requiring no *adjustment* of the cistern. Its *scale-inches* are not true inches but so much shorter as to *compensate* the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This form of instrument has been adopted by the Board of Trade, and has received the approval of the Meteorological Committee of the British Association. In another form of the Barometer, the sides of the *cistern* are of leather, and thus, by aid of a screw acting on the bottom, the surface of the contained mercury can be adjusted to the *zero-point* of the fixed scale; its coincidence being indicated by a little ivory float, whose stem passes freely through the lid and rises of the cistern. When the *index-line* on this little piston is brought, by the adjusting screw, to form one *straight line* with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation; as a slight error here will vitiate the readings from the *vernier*.

When a Barometer having adjustable surfaces has to be removed from its facings, the ivory peg must be screwed so as to form a *tight plug* to the cistern. Then *sew up* the mercury to within a quarter of an inch of the top of the tube, and take down the instrument if it may then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case when, on inclining the instrument so that the mercury strikes the top of the tube, a *sharp tap* is produced. If this is prevented by air it may be removed to the cistern, and got rid of, by inverting the Barometer (care being taken to prevent the loss of mercury by tightening the ivory peg), and gently tapping it; and if this plan fails, the instrument must be repaired.

The Barometer should be suspended in a good *light*, which may be improved by putting a piece of white paper behind the tube. It must be perfectly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire.

In *taking an Observation*, the attached Thermometer is first noted: the tube must then be gently tapped and the cistern-adjustment carefully made. By raising and lowering the eye-index, it must be brought into the plane of the back and front of the index,—usually the lower edge of the vernier, which must be carefully adjusted to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly; so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will greatly facilitate an accurate adjustment and reading of the Barometer.

Protection of Thermometers.—The Council of the Society recommend that Self-registering Thermometers and Hygrometers be enclosed in a Box painted white outside and black within, and fixed 4 feet above grass in an exposed position, free from merely local influences. The lids forming the sides and doors of the Boxes are arranged so as to open to "protect" the Thermometers, and to allow a complete ventilation of the interior. The instruments are suspended on cross-laths, in the centre of the Box and face the door, opening to the north. To accommodate a duplicate set of instruments, which is most desirable, doors are also made open to the south. These Boxes may be had at the Society's Office.

Self-Registering Thermometers.—Professor Phillips's, and Negretti and Zambra's Patent "*Maximum*" Thermometers are recommended; printed directions for their use may be obtained with each instrument. The "*Minimum*" Thermometer of Rutherford is recommended when graduated on the glass stem and affixed to a frame separate from the "*Maximum*." This Thermometer is liable to two demerits, both of which must be guarded against, and may be easily remedied by an observer. When the *column* of spirit breaks it may be re-united by striking the instrument repeatedly against the palm of the hand; when the part of the spirit discolours by high temperatures, it will be found in the upper globe, and must be discoloured from thence by heating that part over a lamp; the alcohol will evaporate and again condense in contact with the body of the liquid. These instruments should be hanging horizontally.

The above remarks apply equally to the Thermometers for

the sun's rays, and the least amount of cloud in the atmosphere ought to be estimated from the greater or less observation of the sky *over-head* (i. e., within 20° or 30° of the zenith). The strata of clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the *clouds* column, though their appearance and changes ought to be noted among the "*Remarks*." The amount of cloud is entered *from a scale of 0 to 10*; thus, when the sky *over-head* is *half covered* by clouds, 5 is entered as the *observation*, and so on.

Observations of the clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner;—In the column "Velocity and Direction," (for example,) will indicate that the upper strata of clouds travel with *extreme* velocity from S.W., and those in the lower regions from W., with one-third the (*extreme*) speed of the former. Again, in the second "Cloud" column, an entry of —, (*ext*) will indicate that the higher regions are covered to the "amount" of 4-tenths with *stratus* clouds; and that the sky is further observed to the extent of 2-tenths by lower clouds of the *stratus-stratus* kind.

Sunshine.—The number of hours in which objects in the sun's rays cast shadows, should be entered in the proper column.

Thermometers.—As the thermometer is used for the purpose of crops and plants greatly depend on the temperature and health of the soil,—its amount and constancy—the Council recommend that observations in this interesting department be made at 9 A.M. by thermometers placed in the earth, their bulbs being sunk to 3, 12, and 22 inches, and the stems above ground protected from the sun's rays, and fitted with sloping tin collars, to prevent rain-water being conveyed to the bulbs by the stems; wooden frames, mounted on posts, may be made of the geological formation and agricultural condition of the soil in which these Thermometers are placed.

Temperature of the Sea.—A knowledge of the temperature of the sea is not only in itself, but in its relations to that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be carefully taken by a properly constructed apparatus, from the ends of piers and rocks round the coast, where it is not influenced by that of river water. At or near the time of high water, on the 5th, 15th, and 25th of each month, the thermometer ought to be sunk exactly six feet (one fathom), and after ten minutes have elapsed, drawn up, and read. When convenient, extra sea observations might be taken for other and greater depths, noting always the temperature of the air and the hour of observation; and continuing to observe for particular depths.

Temperature of Wells.—The temperature of the water at the bottoms of wells ought, when practicable, to be taken, and the depth of the well and of the water noted.

Ozone.—Mention whether Schönbein's or Moffat's papers are used. The paper is affixed by a pin to a board in the thermometer box, and the indication registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 2.5.5. as an *ozone* entry in the schedule, will indicate that the ozone paper is entered as "2.3" on the scale, that the wind is from the N.W., and that its force on the scale 0—6 is "4"; i. e., that it is *blowing fresh*.

Electricity.—Too much importance cannot be attached to electric condition of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper Electrometer is necessary to every complete meteorological observatory.

Remarks.—The "*Remarks*" column is too narrow, but unavoidable so. Some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such are recognised and in use at Greenwich and Southampton, are given at the foot of the column.

Besides special and extraordinary observations, great prominence ought to be given in this column to prevalent differences in direction, colour, velocity, and direction between the lower and upper strata of clouds, the colour of the sky, etc. Remarks ought to be made on the occurrence of meteors, aurora borealis, remarkable depressions and elevations of the barometer, thunder storms, and remarkable falls of snow, hail, or rain, the hour of storms, and attaining their maximum, as well as such notes on suns as have been limited at above. When lofty hills are in the vicinity of an Observatory, the height of clouds and of the snow-line in winter ought to be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. ought to be registered, either in two columns, otherwise unoccupied, or in two ruled off for the purpose, from that headed "*Remarks*." It is intended that observations by the Electrometer should be entered in this manner on the side-margin. Additional remarks may be made on the margin.

Observations in connection with the periodic return of the seasons, possess not only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena, that the published Summaries may fairly represent the whole of Scotland. Observation ought to be confined to individual trees and shrubs; to particular species of birds; and, in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm.

The Council recommend that *term day observations* be taken;—viz., on the 21st days of March, June, September, and December.

Full directions for the use of the instruments mentioned above have been printed, and may be had along with them from the makers.

The Council have agreed to recommend that observers, before purchasing new instruments, should communicate with the Meteorological Secretary; and they consider it desirable that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

(By Order) A. B.

Secretary, 21, Leith Walk, 1868.

FOREST TREES.	IN	LEAF	LEAF BUDS	LEAF FIRST APPEAR.	IN BUD	LEAF FIRST CH.
Alder.						
Asch.						
Beech.						
Birch.						
Blm.						
Larch.						
Lim.						
Oak.						
Sycamore or Plane.						

CROPS.	MENTIONING VARIETY.	THILLING.	APPEARING ABOVE GROUND.	IN BUD.	LEAF FIRST CH.
Barley.					
Bere or Bigg.					
Oats.					
Wheat.					
Beans.					
Pease.					
Potatoes.					
Turnips.					
Rye Grass.					

FRUITS.	FIRST IN BLOSSOM.	FIRST IN BLOSSOM.	FRUIT FIRST APPEAR.	FRUIT FIRST CH.	FRUIT FIRST CH.
Apple.					
Black Currant.					
Cherry.					
Grap.					
Gooseberry.					
Peach.					
Sand-Martin.					
Starling.					
Swan.					
Rail or Corn Crake.					

MIGRATORY BIRDS.	FIRST ARRIVAL.	DEPARTURE.
Cuckoo.		
Home-Swallow.		
Lapwing.		
Plover.		
Sand-Martin.		
Starling.		
Swan.		
Rail or Corn Crake.		

SHRUBS, ETC.	FIRST IN BLOSSOM.	FIRST IN BLOSSOM.	FRUIT FIRST APPEAR.	FRUIT FIRST CH.	FRUIT FIRST CH.
Raspberry.					
Bourne or Elder.					
Broom.					
Lazul.					
Hawthorn.					
Holly.					
Laburnum.					
Lilac.					
Mezereum.					
Mountain Ash or Rowan.					
Red Flowering Currant.					
Rhododendron Confertum.					
Whin.					

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

BOOK-POST.

Mr ALEXANDER BUCHAN,

Secretary of the Meteorological Society of Scotland,

EDINBURGH.



Edinburgh, Leith Hall
Sept 1868

To

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at March Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of October 1868.

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 0 P.M.				HYGROMETER. No. _____				WIND.				RAIN.		CLOUDS.				SUNSHINE. Hours.	THERMOMETERS. under Ground.			Temperature of Water, at Depth of feet. 200.	SEA. Temperature of Surface, 10 fathoms, and Drift.	OZONE. 0-10.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms began and ended.	Days of Month.	
	0 h. A.M.		0 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		0 h. A.M.		0 h. P.M.		0 h. A.M.		0 h. P.M.		9 A.M.		P.M.		0 h. A.M.											
	Baromet. No.	Attach- ed Ther- mometer	Baromet. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	Readings of the H. Cup Anemometer No.	No. of hours in which it fell.	Amount in inches.	Velocity (0-6), and Direction.	Amount (0-10), and Species.	Velocity (0-6), and Direction.		Amount (0-10), and Species.	No. 3 inches.	No. 12 inches.						No. 22 inches.
	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.	0 h. A.M.		0 h. A.M.	0 h. A.M.	0 h. A.M.						0 h. A.M.
1	29.65	50	29.76	50	52	41			45	42	44	41	h	2	h	1															1	
2	29.81	43	29.78	50	54	37			45	42	48	45	h	1	h	05															2	
3	29.72	55	29.47	50	53	42			48	45	48	45	h	05	h	05			R	1.0											3	
4	29.34	49	29.53	50	52	42			48	42	45	43	h	05	h	05															4	
5	29.64	50	29.62	50	57	39			46	43	49	46	h	05	h	05			R												5	
6	29.37	53	29.47	54	57	47			53	50	50	46	s	2	s	15			R												6	
7	29.50	51	29.55	51	53	42			47	44	47	45	h	3	h	3			R												7	
8	29.63	51	29.55	53	53	44			49	45	53	50	h	2	h	15			R												8	
9	29.42	53	29.55	54	58	46			55	53	47	45	s	15	s	05			R												9	
10	29.74	50	29.82	52	54	50			41	40	45	44	e	05	s	05				0.3											10	
11	29.80	51	29.80	54	59	42			53	51	49	48	h	05	s	1															11	
12	29.68	53	29.65	54	56	45			52	49	54	50	s	2	s	2															12	
13	29.70	55	29.85	53	55	42			51	49	44	41	h	2	h	15			R												13	
14	29.86	48	29.66	52	51	34			37	36	47	45	h	15	s	2			R												14	
15	29.18	55	29.15	52	57	44			56	53	46	42	h	5	h	05			R												15	
16	29.10	49	28.98	46	46	39			44	41	40	38	h	4	h	2			R												16	
17	29.05	47	29.20	46	46	36			41	39	41	38	h	3	h	3			R	0.2											17	
18	29.39	46	29.28	42	43	33			40	38	35	33	h	3	h	15			R												18	
19	29.32	43	29.62	44	45	33			37	36	41	38	h	15	h	5			R												19	
20	29.63	40	29.40	44	45	29			34	32	40	37	e	1	s	2															20	
21	29.28	47	29.45	48	48	37			40	39	41	38	h	2	h	2			R												21	
22	29.61	47	29.47	48	48	38			44	41	40	38	h	2	h	1															22	
23	29.28	52	29.25	50	50	35			45	41	38	36	h	2	s	05			R												23	
24	29.14	45	28.95	47	48	35			40	38	42	39	e	15	h	4			R	0.6											24	
25	29.27	48	29.28	48	48	38			43	40	41	39	h	2	h	05															25	
26	29.31	48	29.36	49	48	38			42	39	41	38	h	2	h	4			R												26	
27	29.62	45	29.81	47	45	35			40	38	41	38	h	2	h	15															27	
28	29.87	47	29.24	49	48	37			43	41	47	45	s	5	s	5			R												28	
29	29.15	46	29.47	48	50	37			40	38	40	38	h	4	h	2			R												29	
30	29.60	49	29.62	50	51	38			45	42	57	47	h	15	h	3			R												30	
31	29.62	53	29.50	56	58	48			52	50	58	55	h	3	h	4				0.5											31	
Sum.	15.11	13	17.13	12	5	17			11	12	12	11							1													
Means.	15.28	27.9	15.04	30.0	3.8	12.1			15.3	7.7	15.3	7.2							2.49													
Total corrections by Instru- mental Errors.	49.7		49.7						9																							
Corrected Means.	29.493	49.0	29.485	49.7	51.2	39.1			44.8	42.5	44.9	42.3							8.0													
Notations for Diurnal Range.	+0.42		+0.42		-3	+1.0			-7	-4	-7	-4																				
Corrected Means.	29.535		29.527		50.9	40.1			42.9	42.1	44.2	41.9																				
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	28	29	30		

a.	denotes aurora.	m.	denotes meteor.		
ci.	" cirrus.	ms.	" meteors.		
ci-cu.	" cirro cumulus.	n.	" nimbus.		
ci-s.	" cirro stratus.	r.	" rain.		
cu.	" cumulus.	h. r.	" heavy rain.		
cu-s.	" cumulo-stratus.	c. h. r.	" continued heavy rain.		
d.	" dew.	s.	" sleet.		
f.	" fog.	se.	" snow.		
h. fr.	" hoar-frost.	sl.	" squall.		
h.	" haze.	su.	" solar halo.		
h. d.	" heavy dew.	sq.	" squall.		
h.	" hail.	squ.	" squalls.		
l.	" lightning.	t.	" thunder.		
l. cl.	" light clouds.	t-s.	" thunder storm.		
l. sh.	" light showers.	w.	" wind.		
lu. co.	" lunar corona.	s.	" gale of wind.		
lu. ha.	" lunar halo.				

Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.
0	Calm	1-5	Light breeze	4	Blowing hard
0.5	Very light air	2	Fresh breeze	5	Blowing hard
1	Light air	3	Very fresh	6	Violent gale

Barometer, "corrected Mean" at 9 A.M., minus the Correction \pm = 29.481
for Temp. (Col. 2), = 29.235 - 0.246
Corrected Mean of Barometer at 9 P.M., minus the Correction \pm = 29.472
for Temp. (Col. 4), = 29.527 - 0.055
Mean at Station, corrected, and at 32', = 29.476
Correction for height, feet, above Mean Sea-level, = 296
Mean, reduced to 32', and Sea-level, = 29.772
Highest Reading, corrected for Index error, on the 28th, = 29.880
Lowest Do., Do., on the 24th, = 28.950
Difference, or Monthly Range, = 0.930

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index errors), on the 11th, = 58.7
Lowest in Month, corrected for Index errors, on the 20th, = 30.0
Difference, or Monthly Range, = 28.7
"Corrected Mean" of all the Highest, (Col. 5), = 50.9
"Corrected Mean" of all the Lowest, (Col. 6), = 40.1
Difference, or Mean Daily Range, = 10.8
** Calculated Mean Temperature of Month, = 45.5
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected, for Index errors), on the 11th, = 58.7
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 50.9
Lowest at Night, Black Bulb, (corrected for Index errors), on the 11th, = 30.0
"Corrected Mean" (Col. 8), of Black Bulb Min. on grass, = 40.1
Difference of above Means or Range ("exposed"), = 10.8

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 44.02
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 42.0
Computed Temperature of Dew-Point, = 39.61
Do. Elastic Force of Vapour, = 2.482
Do. Weight of Vapour in a Cubic Foot of Air, = 2.878
Relative Humidity, (Saturation = 100), = 83
RAIN fell on 19 Days; Amount in Inches, = 2.60
WIND. SUMMARY.
Direction N NE E SE S SW W NW
A.M. 0 0 3 0 4 8 14 2
P.M. 0 0 0 2 7 4 15 3
Mean 0 0 2 1 6 6 14 2

Each instrument tested at the Office in Edinburgh bears the stamp "S.M.S." and a number to be entered in the Heading; or the Number and initials of the observer may be here given.
* For Durometer (see page 10) is not yet known.
* When "Hygrometric Deductions" are calculated from Glaisher's Hygrometric Tables, Second Edition only.
* If the Journal Range is unknown, the Artificial Mean of Cols. 5 and 6 will be entered as the "Calculated Mean Temperature."
* Observations not taken under the conditions specified in the Directions on the other side, or noted at the top of each column, must be marked as such by the observer, in each Schedule. See over.

B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gunned or Fastened, and Forwarded by Book Post, prepaid.

Observations made and Return verified by {
(Signed) Donald Miller
Greatest daily range = 16.7° on 5th

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Masack hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of November 1888.
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.								SELF-REGISTERING THERMOMETERS. Read Daily, at 8 P.M.								HYGROMETER. No. _____								WIND.				RAIN.		CLOUDS.				THERMOMETERS. under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms began and ended.	Days of Month.
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.		9 h. A.M.																
		Baromete No.	Attach- ed Ther- mometer	Baromete. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Dirrec- tion.	Force	Dirrec- tion.	Force	Readings of the H. Cup Anemometer No.	No. of hours in which it fell.	Amount in inches.	Velocity, (0-10), and Direc- tion.	Amount, (0-10), and Direc- tion.	Velocity, (0-10), and Direc- tion.	Amount, (0-10), and Species.	No. 3 inches.	No. 12 inches.	No. 22 inches.															
		inches.	°	inches.	°	°	°	°	°	°	°	°	°					9 h. A.M.																								
		°	°	°	°	°	°	°	°	°	°	°	°																													
	1	29.40	59	29.44	53	60	44			60	57	47	45	W	4	SW	6													1												
	2	29.54	50	29.40	51	49	41			45	43	46	44	SW	3	S	6													2												
	3	29.04	52	29.00	52	49	44			49	47	47	46	W	5	W	6													3												
	4	29.13	48	28.99	47	47	34			41	39	36	35	W	1	W	6													4												
	5	29.22	43	29.42	44	40	32			38	33	34	32	W	2	W	1													5												
	6	29.57	42	29.63	40	36	25			34	32	33	31	W	1	W	1.5													6												
	7	29.71	37	29.61	43	38	22			28	26	38	36	W	1.5	W	1													7												
	8	29.59	41	29.80	43	39	29			34	32	35	33	W	1	W	0.5		1.2											8												
	9	29.98	43	30.01	45	42	32			39	36	40	37	W	1	W	1													9												
	10	29.96	45	29.92	45	44	32			41	39	34	32	W	1	E	0.5													10												
	11	29.90	45	30.06	45	44	32			39	36	40	39	E	1	E	0.5													11												
	12	30.71	44	30.28	41	43	32			41	39	33	32	E	0.5	SE	1													12												
	13	30.31	40	30.24	43	44	30			37	35	43	41	W	1	S	0.5													13												
	14	30.13	44	30.14	43	45	38			42	39	42	40	W	0.5	W	0.5													14												
	15	30.16	44	30.13	44	44	37			42	39	40	36	W	1	W	0.5													15												
	16	30.03	40	30.00	45	42	32			35	32	43	39	W	1	W	0.5													16												
	17	30.04	46	30.13	46	44	38			41	39	42	40	W	0.5	W	0.5													17												
	18	30.12	47	30.15	47	42	37			40	39	39	36	W	0.5	W	0.5													18												
	19	30.17	44	30.11	47	40	35			37	36	38	35	W	0.5	W	0.5													19												
	20	29.93	42	29.72	43	38	32			36	33	34	32	SE	0.5	E	1													20												
	21	29.87	43	28.87	46	45	30			35	32	45	42	SE	0.5	E	3													21												
	22	28.63	50	28.61	51	51	42			50	46	46	43	SW	6	W	0.5													22												
	23	28.90	50	29.36	49	48	37			43	40	58	37	W	1.5	W	1.5													23												
	24	29.52	45	29.47	45	40	35			37	35	39	37	W	0.5	SE	0.5													24												
	25	29.35	44	29.30	46	47	34			38	36	42	39	E	1.5	SE	0.5													25												
	26	29.53	47	29.65	40	45	35			41	38	44	43	E	0.5	E	0.5													26												
	27	29.73	45	29.74	45	43	36			45	43	39	38	E	0.5	SE	0.5													27												
	28	29.69	46	29.61	43	41	37			40	39	39	37	SE	0.5	SE	0.5		0.3											28												
	29	29.58	40	29.49	40	39	31			36	35	38	36	E	0.5	E	2													29												
	30	29.39	40	29.34	42	41	36			40	37	41	39	SE	3	S	2													30												
	31																													31												
Sums.		1312	10	1210	11	13	12			12	17	14	14		7		8			254																						
Means.		19.75	1346	19.62	1349	1310	1031			1201	1132	1215	1132		425		496		17	170																						
† Total Corrections for Instrumental Errors.		+0.42		+0.42		+0.3	+1.0			-7	-4	-7	-4		16		86																									
† Corrections for Diurnal Range.																																										
† "Corrected Means."		29.700		29.696		43.4	35.4			40.3	37.7	40.5	37.7		1.42		1.63																									
No. of Columns.		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	28	29	30											

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{1}{10}$ for Temp. (Col. 2), = 29.655
Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{1}{10}$ for Temp. (Col. 4), = 29.651
Mean at Station, corrected, and at 32°, = 29.653
Correction for height, feet, above Mean Sea-level, = 296
Mean, reduced to 32°, and Sea-level, = 29.949
Highest Reading, corrected for Index error, on the 14th, = 30.310
Lowest "Do., "Do., on the 23rd, = 28.610
Difference, or Monthly Range, = 1.700

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 1th, = 59.7
Lowest in Month, corrected for Index errors, on the 8th, = 23.0
Difference, or Monthly Range, = 36.7
"Corrected Mean" of all the Highest, (Col. 5), = 43.4
"Corrected Mean" of all the Lowest, (Col. 6), = 35.4
Difference, or Mean Daily Range, = 8.0
** Calculated Mean Temperature of Month, = 39.4

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected, for Index errors), on the 1th, = 59.7
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 59.7
Lowest at Night, Black Bulb, (corrected for Index errors), on the 1th, = 23.0
"Corrected Mean" (Col. 8), of Black Bulb Min. on grass, = 23.0
Difference of above Means or Range ("exposed"), = 36.7

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 44.2 39.6
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 38.1 37.3
† Computed Temperature of Dew-Point, = 34.4 34.3
† Do. Elastic Force of Vapour, = 1.777 1.99
† Do. Weight of Vapour in a Cubic Foot of Air, = 2.32 2.30
† Relative Humidity, (Saturation = 100), = 82.2 82.8
RAIN fell on 17 Days; Amount in Inches, = 1.70

WIND.		SUMMARY.					
Direction		N	NE	E	SE	S	SW
A.M.	6	0	6	4	0	2	7
P.M.	3	2	5	5	3	1	7
Mean.	4	1	6	4	2	2	7

* Each instrument tested at the Office in Edinburgh bears the stamp "S.M.S." and a number to be entered in the Heading; or the Number and Trial of the Maker may be here given.
† The Diurnal Range for Scotland is as yet unknown.
‡ Practically, though not absolutely a mean correction.
§ These "Hygrometric Deductions" are calculated from Glaisher's Hygrometric Tables, Second Edition only.
|| While the Diurnal Range is unknown, the Arithmetic Mean of Cols. 5 and 6 will be entered as the "Calculated Mean Temperature."
Any Observations not taken under the conditions specified in the Directions on the other side, or noted at the Top of each column, must be marked as such by the observer, in each Schedule. See over.

N.B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gummed or Fastened, and Forwarded by Book Post, prepaid.

Observations made and
Return verified by

(Signed) Donald Miller

Greatest daily range = 16.0 on the 1st of the month

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS.

ONE of the objects of immediate importance that the "Scottish Meteorological Society" has proposed to itself, is to secure a *perfect uniformity* in the system of observation pursued at all its Stations. A certain degree of uniformity is absolutely necessary to justify the publication of Monthly Results from different observations; and it is found that differences between the Returns from any two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position or shelter of instruments, different hours of observation, or even from the use of differently constructed instruments. It is therefore hoped, that those persons who kindly furnish Reports to the Society will try a scrupulous attention to the following Directions, secure for their Monthly Returns, an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, an entire comparableness among the several Returns, without which the Society's Reports must inevitably fail in achieving one of the main objects of Meteorological Observation.

Hour of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway Time only) twice a-day for some, and once (morning or evening) for other instruments, as specified, in the following remarks, or at the top of the schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading at what time it was taken, if not at 9 o'clock.

Barometer.—If *Wooler glasses* and *Aneroids*, though admirably adapted, as the latter certainly are, to indicate variations of atmospheric pressure, are not well fitted for scientific purposes. Nor can any Barometer be used for Meteorological Observations that is not supplied with such means of *adjustment* as will enable it to accurately measure from the fluctuating surface of the mercury in the cistern. It is also necessary that every Barometer shall have been compared with a *Standard*.

Two moderate-priced Barometers have been approved of by the Council; if properly tested and attended to, they are both well adapted to Meteorological purposes.

An excellent Barometer is constructed by Mr. Adie of London, the use of which is attended with the great convenience of requiring no *adjustment* of the cistern. Its *scale-values* are not true inches, but so much shorter as to *compensate* the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This form of instrument has been adopted by the Board of Trade, and has received the approval of the Meteorological Committee of the British Association. In another form of the Barometer, the sides of the *cistern* are of leather, and thus, by aid of a screw acting on the bottom, the surface of the contained mercury can be adjusted to the *zero-point* of the fixed scale; when it passes freely through the lid and case of the cistern. When the *index-line* on this little piston-rod is brought, by the adjusting screw, to *form one straight line* with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this *preliminary* setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the *zenith*.

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must be screwed so as to form a tight plug to the cistern. Then *sozen* up the mercury to within a quarter of an inch of the top of the tube, and take down the instrument; it may then be carried with the cistern upmost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case when, on inclining the instrument so that the mercury strikes the top of the tube, a *sharp tap* is produced. If this is prevented by air it may be removed to the cistern, and got rid of, by inverting the Barometer (care being taken to prevent the loss of mercury by tightening the ivory peg), and gently tapping it; and if this plan fails, the instrument must be repaired.

The Barometer should be suspended in a good *light*, which may be improved by putting a piece of white paper behind the tubes. It must be perfectly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire.

In *taking an Observation*, the attached Thermometer is first noted; the tube must then be gently tapped and the cistern-adjustment carefully made. By raising and lowering the eye, it must be brought into the plane of the back and front of the index;—usually the lower edge of the vernier, which must be carefully adjusted to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly; so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will greatly facilitate an accurate adjustment and reading of the Barometer.

Protection of Thermometers.—The Council of the Society recommend that Self-registering Thermometers and Hygrometers be enclosed in a Box, painted white outside, and black within, and fixed 4 feet above grass in an exposed position, free from any local influences. The laths forming the sides and doors of the Boxes are arranged so as at once to "protect" the Thermometers, and to allow a complete ventilation of the interior. These instruments are suspended on cross-laths, in the centre of the Box, and face the door opening to the north. To accommodate a duplicate set of instruments, which is most desirable, doors are also made to open to the south. These Boxes may be had at the Society's Office.

Self Registering Thermometers.—Professor Phillips's, and Negretti and Zambra's Patent "*Maximum*" Thermometers are recommended; printed directions for their use may be obtained with each instrument. The "*Minimum*" Thermometer of Rutherford is recommended when graduated on the glass stem and affixed to a frame separate from the "*Maximum*." This Thermometer is liable to two derangements, both of which must be guarded against, and may be easily remedied by an observer. When the *columns* of spirit breaks, it may be re-quit by striking the instrument repeatedly against the palm of the hand; when part of the spirit distils by high temperature, it will be found in the upper lobe, and must be dislodged from thence by heating that part over a lamp; the alcohol will evaporate, and again condense in contact with the body of the liquid. These instruments should be hung horizontally.

The above remarks apply equally to the Thermometers for

registering the greatest heat from the sun's rays, and the least amount of cloud in the atmosphere ought to be estimated from the greater or less obscuration of the sky or *cloud* (*h. c.* within 20° or 30° of the zenith). The stain of clouds that appear near the horizon is viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the *clouds* column, though their appearances and changes ought to be noted among the "*Remarks*." The amount of cloud is entered from a scale of 0 to 10; thus, when the sky *cometh* is *half* covered by clouds, 5 is entered as the *observation*, and so on.

Observations of the clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—In the column "*Velocity* and Direction," 6 S.W. (for example,) will indicate that the upper strata of clouds travel with *calent* velocity from S.W., and those in the lower regions from W., with one-third the (*extreme*) speed of the former. Again, in the second "*Cloud*" column, an entry of 2, east, will indicate that the higher regions are covered to the "amount" of 4-tenths with *stratus* clouds; and that the sky is further obscured to the extent of 2-tenths by *low* clouds of the *cumulo-stratus* kind.

Schedule.—The number of hours in which objects in the sun's rays cast shadows, should be entered in the proper column.

Underground Thermometers.—As the germination and health of crops and plants greatly depend on the temperature of the soil,—its amount and constancy,—the Council recommend that observations in this interesting department be made at 9 A.M., by thermometers placed in the earth, their bulbs being sunk to 3, 12, and 22 inches, and the stems above ground, protected from the sun's rays, and fitted with sloping tin collars, to prevent rain-water being conveyed to the bulbs by the stems or wooden frames. Mention must be made of the geological formation and agricultural condition of the soil in which these Thermometers are placed.

Temperature of the Sea.—A knowledge of the temperature of the sea is not only in itself, but in its relations to that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be carefully taken by a properly constructed apparatus, from the ends of piers and rocks round the coast, where it is not influenced by that of river water. At or near the time of high water, on the 5th, 15th, and 25th of each month, the thermometer ought to be sunk exactly six feet (one fathom), and after ten minutes have elapsed, drawn up and read. When convenient, extra sea observations might be taken for other and greater depths, noting always the temperature of the air, and the hour of observation; and continuing to observe for particular depths.

Temperature of Wells.—The temperature of the water at the bottoms of wells ought, when practicable, to be taken, and the depth of the well and of the water noted.

Ozone.—Mention whether Schönbach's or Moffat's papers are used. The paper is affixed by a pin to a bari in the thermometer box, and the indication registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 3°, as an ozone entry in the schedule, will indicate that the ozone paper is tinted as 3° on the scale, that the wind is from the N.W.; and that its force on the scale 0-6 is 4; i.e., that it is *blowing fresh*.

Electricity.—Too much importance cannot be attached to electric condition of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper Electrometer is necessary to every complete meteorological observatory.

Remarks.—The "*Remarks*" column is too narrow, but unavoidably so. Some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are recognised and in use at Greenwich and Southampton, are given at the foot of the column. Besides special and extraordinary observations, great prominence ought to be given in this column to prevalent diseases, differences in character, colour, velocity, and direction between the lower and upper strata of clouds, the colour of the sky, etc. Remarks ought to be made on the occurrence of meteors, aurora borealis, remarkable depressions and elevations of the barometer, thunder storms, and remarkable falls of snow, hail, or rain, the hour of storms of wind attaining their maximum, as well as such notes on storms as have been limited at above. When lofty hills are in the vicinity of an Observatory, the height of clouds and of the snow-line in winter ought to be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. ought to be registered, either in two columns, otherwise unoccupied, or in two ruled off for the purpose, from that headed "*Remarks*." It is intended that observations by the Electrometer should be entered in this manner or on the side-margin. Additional remarks may be made on the margin.

Observations in connection with the periodic return of the seasons, possess not only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena, that the published Summaries may fully represent the whole of Scotland. Observation ought to be confined to individual trees and shrubs; to particular species of birds; and, in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm.

The Council recommend that *tem* day observations be taken;—viz., on the 21st days of March, June, September, and December.

Full directions for the use of the instruments mentioned above have been printed, and may be had along with them from the makers.

The Council have agreed to recommend that observers, before purchasing new instruments, should communicate with the Meteorological Secretary; and they consider it desirable that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

(By Order) A. B.

LONDON, 30th December 1855.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	FRUITS.	MIGRATORY BIRDS.
Alder,	Apple,	Cuckoo,
Ash,	Black Currant,	House-Sparrow,
Beech,	Cherry,	Lapwing,
Birch,	Hazelnut,	Plover,
Elm,	Hawthorn,	Sand-Martin,
Larch,	Holly,	Scallop,
Lincoln,	Laburnum,	Swan,
Oak,	Mountain Ash or Rowan,	Thrush,
Yew,	Rhododendron Ponticum,	Whit,

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

BOOK-POST.

Mr ALEXANDER BUCHAN,

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

Edinburgh
Nov. 1856.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Marble Hall, County of Edinburgh, in Lat. _____, Long. _____, Distance from Sea _____ miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of December 1868.
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Road Daily, at 9 P.M.				HYGROMETER. No. _____				WIND.				RAIN.		CLOUDS.				SUNSHINE. Hours.	THERMOMETERS. under Ground.			SEA.	OZONE. 0-10.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms began and ended.</i>	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs. Ground.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer No. _____	No. of hours in which it fell.	Amount in inches.	9 A.M.		P.M.		9 h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		Barometer No. _____	Attached Thermometer No. _____	Barometer. No. _____	Attached Thermometer No. _____	Max. No. _____	Min. No. _____	Max. in Sun's rays No. _____	Min. on Grass. No. _____	Dry bulb. No. _____	Wet bulb. No. _____	Dry bulb. No. _____	Wet bulb. No. _____	Direction. No. _____	Force No. _____	Direction. No. _____	Force No. _____				Velocity, (0-10), and Direction. No. _____	Amount, (0-10), and Species. No. _____	Velocity, (0-10), and Direction. No. _____		Amount, (0-10), and Species. No. _____	No. _____	No. _____					No. _____																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
																																	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction \pm for Temp. (Col. 2), = 29.066 - 0.046 = 29.020
"Corrected Mean" of Barometer at 9 P.M., minus the Correction \pm for Temp. (Col. 4), = 29.070 - 0.047 = 29.023
Mean at Station, corrected, and at 32°, = 29.022
Correction for height, feet, above Mean Sea-level, = 296
Mean, reduced to 32°, and Sea-level, = 29.318
Highest Reading, corrected for Index error, on the 9 th, = 29.840
Lowest Do., Do., on the 27 th, = 28.150
Difference, or Monthly Range, = 1.690

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 4 th, = 54.7
Lowest in Month, corrected for Index errors, on the 30 th, = 26.0
Difference, or Monthly Range, = 28.7
"Corrected Mean" of all the Highest, (Col. 5), = 45.4
"Corrected Mean" of all the Lowest, (Col. 6), = 37.5
Difference, or Mean Daily Range, = 7.9
** Calculated Mean Temperature of Month, = 41.4

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected, for Index errors), on the th, =
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =
"Corrected Mean" (Col. 8), of Black Bulb Min. on grass, =
Difference of above Means or Range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 41.4
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 38.3
Computed Temperature of Dew-Point, = 36.7
Do. Elastic Force of Vapour, = 218
Do. Weight of Vapour in a Cubic Foot of Air, = 2.52
Relative Humidity, (Saturation = 100), = 84
RAIN fell on 20 Days; Amount in Inches, = 3.80

WIND.		SUMMARY.									
Direction		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		1	2	6	6	3	5	6	2	0	1.73
P.M.		1	2	3	2	9	5	8	1	0	2.07
Mean.		1	2	4.4	4	6	5	7	2	0	1.90 = 3.616

N.B.—The Sums to be correctly added, and the Means deduced. Returns from the "Principal Towns" should be in Edinburgh not later than the 3rd; those from Other Places, not later if possible than the 6th. This Schedule not to be Gummed or Fastened, and Forwarded by Book Post, prepaid.

Observations made and Return verified by

(Signed) Donald Miller

Greatest daily range = 18.7 on the 11th

P

