

## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leppan, County of Mid Lothian, 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 1890.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS.  As to occurrences of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.  Mention the hour at which Storms, including Thunder and Lightning, 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.		Temperature of Well at depth of feet, No.						Temperature at 1 fathom, and Density.		9 A.M.		9 P.M.
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No. of hours in which it fell.	Amount in inches.	Direction.	Force.	Direction.	Force.	Readings of the H. Cup Anemometer.	Velocity (0-6) and Direction.	Amount (0-10) and Species.	Velocity (0-6) and Direction.	Amount (0-10) and Species.	SUNSHINE.	No. 3 inches.				No. 12 inches.	No. 22 inches.	Temperature of Well at depth of feet, No.	Temperature at 1 fathom, and Density.	9 A.M.
		* No.	inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	No.	9 h. A.M.	°	°	°	°	°	°	°	°	°	°	°	°	°
	1	30.260	56	30.270	62	45.038				42.040	40.038				SW	2			5	0			39.0	39.5			42.8							1	
	2	30.062	56	29.916	61	44.039				42.039	34.031				SW	2			9	5	3		39.5	39.5										2	
	3	29.672	56	29.570	60	43.290				34.033	037.035	0.20			SW	2			10	6			38.0	38.5										3	
	4	29.692	53	29.534	60	44.032				43.042	35.535	0.05			SW	3			8	0			37.0	38.0			42.0							4	
	5	29.208	52	29.452	60	50.035				49.045	46.043	0.05			SW	3			5	0	1		39.5	38.0			43.0							5	
	6	29.260	55	29.000	63	52.042				44.041	53.050	0.12			SW	3			8	8			41.0	40.0			42.8							6	
	7	29.308	60	30.080	65	53.540				53.050	48.044	0.05			SW	3			9	5			45.0	41.0			44.7							7	
	8	30.064	60	29.670	62	57.043				45.042	44.042	0.20			SW	3			2	10			42.0	42.0			43.8							8	
	9	29.882	58	29.906	62	49.044				43.040	43.042	0.25			SW	3			4	10			41.0	43.0			44.0							9	
	10	29.620	60	30.154	62	47.043				47.045	42.041	0.07			SW	3			10	10			43.0	43.0			44.0							10	
	11	30.020	58	29.906	61	52.539				43.042	53.050	0.08			SW	3			10	5			43.0	43.0										11	
	12	29.994	57	30.070	64	50.040				43.040	43.040	0.04			SW	3			2	0			43.0	42.0			44.0							12	
	13	29.752	56	29.976	63	46.041				45.042	42.038	0.04			SW	3			5	0			43.0	43.0			44.0							13	
	14	29.880	54	29.470	65	52.041				45.042	46.044	0.20			SW	3			9	10			39.5	40.0			43.8							14	
	15	29.450	56	29.370	60	57.041				41.038	52.048	0.04			SW	3			8	5			41.0	42.0										15	
	16	29.824	56	29.744	65	52.040				50.548	57.045	0.02			SW	3			4	8			43.0	42.0			44.2							16	
	17	29.874	60	29.710	65	57.049				49.045	52.040	0.02			SW	3			2	4			45.0	43.0			44.6							17	
	18	29.270	56	28.876	60	50.041				42.041	50.045	0.13			SW	3			8	2							44.6							18	
	19	28.780	55	29.010	60	43.540				43.548	037.036	0.53			SW	3			10	10			40.5	42.0			43.7							19	
	20	29.152	52	29.238	58	39.036				39.035	035.034	0.08			SW	3			4	10			39.0	40.5			42.5							20	
	21	29.276	52	29.080	60	42.034				35.032	40.038	0.36			SW	3			8	8			36.0	38.0			43.0							21	
	22	28.870	52	29.046	58	37.033				34.033	37.034	0.09			SW	3			10	0							41.2							22	
	23	28.670	50	29.230	26.0					29.0					SW	3			9				34.0	34.0			39.8							23	
	24	29.130		29.310																														24	
	25	28.930		28.930	53					28.0		0.20																						25	
	26	29.204	50	29.338	58	42.0				42.035	32.035				SW	3			5	2			34.0	38.5			41.8							26	
	27	29.570	50	29.952	60	43.034				40.037	038.036				SW	3			1	0			32.0	36.0			41.2							27	
	28	29.920	50	30.120	60	40.031				33.032	036.036				SW	3			9	0			35.5	38.0			40.2							28	
	29	30.284	50	30.250	60	47.032				36.534	42.040				SW	3			2	10			36.5	38.0										29	
	30	30.250	53	30.250	62	51.534				45.544	57.049	0.10			SW	3			10	8			46.0	38.0										30	
	31	30.250	55	30.310	65	52.545				50.047	47.045				SW	3			9	6			45.0	40.0										31	
	Sums.	660.82	151	661.33	157	54.3				290.23	330.26	2.82							195	172			55.0	62.5			5.0								
	Means.	21.64	55	21.64	61	54.3				46.8	40.2	0.09							6.3	5.7			46.2	40.2			43.3								
	+ Total Corrections for Instrumental Errors.	-30		678																															
	+ Corrections for Diurnal Range.																																		
	+ "Corrected Means."																																		
	No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora.

ci. cirrus.

ci-cu. cirro-cumulus.

ci-s. cirro-stratus.

cu. cumulus.

cu-s. cumulo-stratus.

d. dew.

f. fog.

fr. frost.

h-fr. hoar-frost.

h. haze.

h.d. heavy dew.

hl. hail.

li. lightning.

li-cl. light clouds.

li-sh. light showers.

lu-co. lunar coronae.

lu-ha. lunar halo.

m. denotes meteor.

ms. meteors.

n. nimbus.

r. rain.

h-r. heavy rain.

c.h-r. continued heavy rain.

s. stratus.

sc. scud.

sle. sleet.

snow. snow.

so-ha. solar halo.

sq. squall.

sq.s. squalls.

t. thunder.

t-s. thunder-storm.

w. wind.

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

## NOTATION USED IN GENERAL REMARKS.

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.	stratus.
f.	fog.	sc.	scud.
fr.	frost.	s.	sleet.
h. fr.	hoar-frost.	s.	snow.
h.	haze.	so. h.	solar halo.
h. d.	heavy dew.	sq.	squall.
hl.	hail.	sq.	squalls.
l.	lightning.	t.	thunder.
li. cl.	light clouds.	t. s.	thunder-storm.
li. sh.	light showers.	w.	wind.
lu. co.	lunar corona.	g.	gale of wind.
lu. ha.	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  $\frac{1}{10}$  for Temp. (Col. 2), = 29.580  
"Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\frac{1}{10}$  for Temp. (Col. 4), = 29.592  
Mean at Station, corrected, and at 32°, = 29.586  
Correction for height, feet above Mean Sea-level, = 2.2  
Mean, reduced to 32°, and Sea-level, = 29.608  
Highest Reading, corrected for Index error, on the 31 th., = 30.310  
Lowest Do Do, on the 19 th., = 28.780  
Difference, or Monthly Range, = 1.530

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 6 th., = 54.0  
Lowest in Month, corrected for Index errors, on the 23 th., = 26.0  
Difference, or Monthly Range, = 28.0  
"Corrected Mean" of all the Highest, (Col. 5), = 47.5  
"Corrected Mean" of all the Lowest, (Col. 6), = 36.9  
Difference, or Mean Daily Range, = 10.6  
\*\* Calculated Mean Temperature of Month, = 42.2

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), = 42.5

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 40.4

Computed Temperature of Dew-Point, = 37.8

Do. Elastic Force of Vapour, = .228

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

Relative Humidity (Saturation = 100), = 84

RAIN fell on 19 Days; Amount in Inches, = 2.82

WIND.		SUMMARY.			
Direction.		N	NE	E	SE
A.M.		2		9	8
P.M.		1	1	8	2
Mean.		1	1	0	4

Observations made and  
Return verified by

(Signed)

Robert Muirhead







## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glasgow, 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 188 90  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				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, including Thunder and Lightning, began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs. Sun-rays, Grass.		9 h. A.M.		9 h. P.M.			No. of hours in which it fell.		Amount in inches.		9 h. A.M.		9 h. P.M.		Readings of the H. Cop. Anemometer.		9 A.M.					P.M.		SUNSHINE.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Barometer. * No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.	Max. in Shade.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No.	Amount in inches.	Direction.	Force.	Direction.	Force.	No.	Amount (0-10), and Direction.	Velocity (0-10), and Direction.	Amount (0-10), and Direction.	Amount (0-10), and Direction.					No.	Amount (0-10), and Direction.	Velocity (0-10), and Direction.	Amount (0-10), and Direction.	Amount (0-10), and Direction.	Hours.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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## NOTATION USED IN GENERAL REMARKS.

a.	aurora.	m.	meteor.
ci.	cirrus.	ms.	meteor.
ci-cu.	cirrus-cumulus.	n.	nimbus.
ci-s.	cirrus-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.	s.	sled.
h-fr.	hoar-frost.	s.	snow.
h.	haze.	so. h.	solar halo.
h. d.	heavy dew.	sq.	squall.
hl.	hail.	sqs.	squalls.
l.	lightning.	t.	thunder.
li. cl.	light clouds.	t. s.	thunder-storm.
li. sh.	light showers.	w.	wind.
lu. co.	lunar corona.	g.	gale of wind.
lu. 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.
0-5	Calm	1-5	Light breeze	5	Blowing hard
5-6	Very light air	5-6	Fresh breeze	6	Blowing a gale
6	Light air	6	Very fresh	6	Violent gale

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction  $\frac{1}{100}$  for Temp. (Col. 2), = 30.229  
"Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\frac{1}{100}$  for Temp. (Col. 4), = 30.222  
Mean at Station, corrected, and at 32°, = 30.226  
Correction for height, feet above Mean Sea-level, = 22  
Mean, reduced to 32°, and Sea-level, = 30.248  
Highest Reading, corrected for Index error, on the 23 th, = 30.800  
Lowest Do. Do., on the 13 th, = 29.544  
Difference, or Monthly Range, = 1.256

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 1 th, = 51.0  
Lowest in Month, corrected for Index errors, on the 1 th, = 25.0  
Difference, or Monthly Range, = 26.0  
"Corrected Mean" of all the Highest, (Col. 5), = 43.0  
"Corrected Mean" of all the Lowest, (Col. 6), = 33.5  
Difference, or Mean Daily Range, = 9.5  
\*\* Calculated Mean Temperature of Month, = 38.2  
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 1 th, = 51.0  
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 51.0  
Lowest at Night, Black Bulb (corrected for Index errors), on the 1 th, = 25.0  
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 33.5  
Difference of above means or range ("exposed"), = 26.0

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 37.4  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 35.9  
Computed Temperature of Dew-Point, = 33.9  
Do. Elastic Force of Vapour, = 1.94  
Do. Weight of Vapour in a Cubic Foot of Air, = 87  
Relative Humidity (Saturation = 100), = 87  
RAIN fell on 2 Days; Amount in Inches, = 0.67

WIND.		SUMMARY.										
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.	
A.M.			3	6		5	2	2	10			
P.M.		2	5	6	1	2	3	3	6			
Mean.	0	1	4	6	1	3	2	3	8			

Observations made and  
Return verified by

(Signed)

Robert Muirhead



# FOR TAKING METEOROLOGICAL

## WITH REMARKS ON THE USE OF INSTRUMENTS.

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Louvre-boarded Box, for Thermometers, painted white inside and outside, and reserved to four stout posts, also painted white, firmly secured in the ground. The posts must be of such a length that when the Thermometers are hung in position the Balls of the Minimum Thermometers, and of the Dry and Wet Bulb Thermometers, will be exactly at the same height of four FEET above the ground, the Maximum Thermometer being hung immediately above the Minimum Thermometer. The Thermometer Box, is to be placed over a plot of grass, and in a free open space to which the sun's rays have free access, during as much of the day as surrounding conditions enable the Observer to secure. The Thermometers are suspended on cross-balls in the centre of the Box, and face the door, which should open to the north.

The Council regard the question of UNIFORMITY OF HEIGHT above the GROUND, and METHOD IN PROTECTING THE THERMOMETERS, vital in every system of Meteorological Observation, with

that it is impossible to compare the climates of places with each other as regards their most important features.

Professor Phillips, and Negretti and Zambra's Maximum Thermometers, and Rothgerfs's Minimum Thermometer, are recommended. It is recommended that these Thermometers be graduated on the glass stem. The Minimum Thermometer is liable to two derangements—viz, the rupture of spirit breaking, and part of the spirit distilling by high temperature and lodging at the top of the tube. This derangement of occasional occurrence with procured Thermometers, but of frequent occurrence with exposed Thermometers. Hence a systematic examination of Minimum Thermometers ought to be a regular part of this work carried on by each Observer.

Fortunately, Spirit Thermometers may be easily set right by any one, when the column of spirit chances to separate from the bulb. The thermometer is to be held then, the bulb being turned downwards, so that the object being on the principle of centrifugal force to be thrown outwards, the detached portion of spirit will be thrown down the detached portion of spirit will mix with the remaining portion. A few blows, or sucking strokes, will usually

[illegible]

It must, however, be added, that the whole subject of the observation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

The Hygrometer in use at the Society's Stations consists of two Thermometers usually, but not necessarily, mounted together, one for the air and one for the wet bulb, on the same frame. As apparently slight deviations from the approved form of this apparatus seriously vitiate the observations, the Observers are required to acquire the Hygrometer before using it. The bulb of the thermometer is at least an inch from the scales and frame to which they are attached; the frame must be such as will bring the tubes forward an inch from any board on which it may be suspended; the water must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but in no case under the bulb; the thermometer must be of medium fineness, and fastened at the neck of the bulb with the cotton, which also supplies it with water. It must be taken care to by the Observer that the mistlin is always clean and moist, and that the wet bulb is always observed; observation is a matter of great delicacy, and the Hygrometer must be used with much care. A very serious loss from 15 to 30 minutes before the beginning of observation.

From the film of ice thus formed evaporation will proceed as from the moist cloth in ordinary circumstances.

In reading the Thermometer great care must be taken to bring

the eye exactly opposite the tip of the index on the column of mercury. The reading ought to be taken tenths of a degree, and noted in decimals. Thus a thermometer will be read— $39^{\circ} \cdot 9$ ,  $40^{\circ} \cdot 0$ , or  $40^{\circ} \cdot 1$ ; or again,  $40^{\circ} \cdot 2$ ,  $40^{\circ} \cdot 3$ ,  $40^{\circ} \cdot 4$ , according as it indicates a little under, an exact, or a little over  $40^{\circ}$ , or  $40^{\circ}$  and  $\frac{1}{10}$ , respectively. So also, if the index is a degree or less, must be registered  $40^{\circ} \cdot 2$ ,  $40^{\circ} \cdot 3$ , and  $40^{\circ} \cdot 4$ , respectively. In reading Rutherford's Minimum thermometer, the indication of that end of the index which is next the surface of the spirit is alone noted. On opening the Thermometer Box, the Dry and Wet Bulb Thermometers are to be first rapidly read, inasmuch as they are readily affected by heat from the person of the Observer.

The Hygrometer and at least A.M. and 9 P.M. The Self-Registering Thermometer. The thermometer read at 9 P.M. only, after observing the highest temperature, and least degree of barometric depression in the 24 hours preceding. It is, not matter of

In the 24 hours preceding the test, it is not a matter of indifference when the Self-Registering Thermometers are read, since, winter at least, the extremes may occur at any hour; and it is necessary to refer to their contents for their proper meteorological value. In the Society's reports, the notations registered on the thermometers are those of a thermometer commencing at 9 P.M. on the 4th, and extending till 9 A.M. on the 5th.

No instrument ought to be used for meteorological purposes until it has been carefully tested by comparison with a standard Thermometer. When such Thermometers are not graduated on the stem, but merely on an attached scale, undergo repairs, they are very liable to be moved from their position on the scale, and ought never afterwards to be used without being re-tested. The Self-Registering, especially the minimum Thermometers, ought frequently to be compared with a dry bulb of the Hygrometer. The freezing-point of each thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

In selecting instruments, the following points require attention.—The divisions of the vernier of Barometers in reference to the scales, and the peep provision of the Barometer for air; the

water, in cases where the observations cannot be taken daily, the observation may be made on the 5th, 14th, and 25th of each month. When convenient, extra Sea Observations might be taken for other months and greater depths, noting always the Temperature of the Air, and the Hour of Observation. It is also very desirable that observations on the daily Maxima and Minima by Thermometers continuously immersed, be situated at points along the coast, by the method proposed by Mr. T. Stevenson, and already commenced at Peterhead and Liverpool. The Temperature of the water at the bottom of Wells ought, when practicable, to be taken, both the depth of the

of Wells. Well and of the water being noted. Mention what Test-Papers are used, Schönbein's or Morfett's etc. The Paper is affixed by a pin to a board in the moment Box, and the indications 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:—this 3<sup>rd</sup> as an Ozmo entry in the schedule will indicate that the Ozmo Paper is entered as 3 on the scale, that the wind is from the N.W., and that its force on the scale (0—5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, meteorological, and meteorological phenomena generally. A proper electrometer is, in truth, necessary to every complete meteorological observatory.

The Remains column is unavoidably too narrow. Some of the most valuable Observations that can be taken are

**Remarks.**—These wind rules can be given more hours assigned. The use of combinations ought, therefore, to be taken very advantage of, such as—Basic such as in general is given the lowest temperature, and the secondary is given the highest, and the difference comparative ought to be given in this category. The various diseases, differences in character, color, 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, Aurors Boreales, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-storms, and remarkable falls of Snow, Hail, &c.

On the border, and the storm of rain commencing, attaining their maximum, and ending, as well as such Storms as have been hinted at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and the Snow-line in winter should be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. should be registered, either in two columns, otherwise unoccupied, or ruled off for the purpose, from the column of 'Remarks'.

Observations in connection with the Periodic Return of the Seasons, as far as possible, not only such observations as have

Observations in Seasons, possess not only great scientific value, but connection with are of considerable importance in connection with the Periodic Fauna, Agriculture, Horticulture, and Natural History. The Editor of the *Annals* would direct the special attention of Observers to the registration of such phenomena, so 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 on a selected piece of ground or farm. The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed.

The Council recommend Observers, before purchasing new instruments, and in replacing old ones, to communicate with the Meteorological Secretary, in order that every instrument may be examined and improved before being used; and they consider it necessary that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

A. B.  
(By Order)

ERINBURGH, December 1888.

Sowing (Ground,	In Box or Flower,	First Cut or Raised

[illegible][illegible][illegible][illegible]

FOREST TREES.		In		To first	
		Flower.			
Alder,	.	.	.	.	.
Ash,	.	.	.	.	.
Beech,	.	.	.	.	.
Birch,	.	.	.	.	.
Elm,	.	.	.	.	.
Larch,	.	.	.	.	.
Lim,	.	.	.	.	.
Oak,	.	.	.	.	.
Sycamore or Plane,	.	.	.	.	.

*Scottish Met*

BOOK POST.

[illegible]

FOREST TREES.		In flower.	Leaf buds first appear.	In leaf.	Diseased or injured leaves.	CROPS.	Sowing or planting.	Appearing above ground.	In flower.	First cut or raised.
Alder,						Barley,				
Ash,						Bare or Dried,				
Beech,						Oats,				
Birch,						Wheat,				
Elm,						Peas,				
Larch,						Beans,				
Lim,						Potatoes,				
Oak,						Tumpe,				
Sycamore or Plane,						Rye Grass,				

  

SHRUBS, ETC.		First in blossom.	FRUIT.	First in blossom.	FRUIT ripens generally.	MIGRATORY BIRDS.	Risk Arrival.	Departure.
Barberry,			Apple,		Cuckoo,			
Boulevard or Elder,			Black Currant,		Crutew,			
Broom,			Cherry,		House-Swallow,			
Hazel,			Gem,		Lapwing,			
Hawthorn,			Gooseberry,		Plover,			
Holly,			Peach,		Sand Martin,			
Laburnum,			Pear,		Starling,			
Lilac,			Plum,		Swan,			
Mazeton,			Strawberry,		Rail or Corn Crake,			
Mountain Ash or Rowan,								
Real Flowering Currant,								
Rhododendron Ponticum,								
Whin,								

  

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

FOREST TREES.		In flower.	Leaf buds first appear.	In leaf.	Diseased or injured leaves.	CROPS.	Sowing or planting.	Appearing above ground.	In flower.	First cut or raised.
Alder,						Barley,				
Ash,						Bare or Dried,				
Beech,						Oats,				
Birch,						Wheat,				
Elm,						Peas,				
Larch,						Beans,				
Lim,						Potatoes,				
Oak,						Tumpe,				
Sycamore or Plane,						Rye Grass,				

  

SHRUBS, ETC.		First in blossom.	FRUIT.	First in blossom.	FRUIT ripens generally.	MIGRATORY BIRDS.	Risk Arrival.	Departure.
Barberry,			Apple,		Cuckoo,			
Boulevard or Elder,			Black Currant,		Crutew,			
Broom,			Cherry,		House-Swallow,			
Hazel,			Gem,		Lapwing,			
Hawthorn,			Gooseberry,		Plover,			
Holly,			Peach,		Sand Martin,			
Laburnum,			Pear,		Starling,			
Lilac,			Plum,		Swan,			
Mazeton,			Strawberry,		Rail or Corn Crake,			
Mountain Ash or Rowan,								
Real Flowering Currant,								
Rhododendron Ponticum,								
Whin,								

  

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



## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Goppa, County of Mid Lothian, 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 188 90  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE.	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, including Thunder and Lightning, 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.		9 h. P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		Barometer.	Attached Ther- mometer.	Barometer.	Attached Ther- mometer.	Max.	Min.	Max.	Min.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	No. of hours in which it fell.	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.	Ther- mometer at 1 foot, and Density.	0-10.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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BAROMETER, "corrected Mean" at 9 A.M., minus the Correction  $\frac{1}{10}$  for Temp. (Col. 2), = 29.753.....0.68.....29.685  
"Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\frac{1}{10}$  for Temp. (Col. 4), = 29.740.....0.61.....29.659  
Mean at Station, corrected, and at 32°,.....29.672  
Correction for height, feet above Mean Sea-level,.....2.2  
Mean, reduced to 32°, and Sea-level,.....29.694  
Highest Reading, corrected for Index error, on the 3 th,.....30.610  
Lowest Do. Do., on the 16 th,.....29.112  
Difference, or Monthly Range,.....1.498

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 6 th,.....60.0  
Lowest in Month, corrected for Index errors, on the 3 th,.....23.0  
Difference, or Monthly Range,.....37.0  
"Corrected Mean" of all the Highest, (Col. 5),.....40.9  
"Corrected Mean" of all the Lowest, (Col. 6),.....37.9  
Difference, or Mean Daily Range,.....12.0  
\*\* Calculated Mean Temperature of Month,.....43.8  
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),.....44.0  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12),.....41.5  
Computed Temperature of Dew-Point,.....38.6  
Do. Elastic Force of Vapour,.....234  
Do. Weight of Vapour in a Cubic Foot of Air,.....81  
Relative Humidity (Saturation = 100),.....81  
RAIN fell on 10 Days; Amount in Inches,.....1.38

WIND.		SUMMARY.			
Direction.	N	NE	E	SE	S
A.M.	2	2	5	2	9
P.M.	2	1	3	1	5
Mean.	2	2	1	3	4

Observations made and  
Return verified by

(Signed)

Robert Muirhead







# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Yoppa, County of Mid Lothian, 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 April 1890

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.		WIND.				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, including Thunder and Lightning, began and ended.	Days of Month.				
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs. Min. on Sunrays.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		Readings of the H. Cap Anemometer. No. 9 h. A.M.	Velocity (0-10), and Direction.	Amount (0-10), and Species.	Velocity (0-10), and Direction.	Amount (0-10), and Species.	SUNSHINE. H.ours.	9 h. A.M.						Temperatures at 1 fathom, and Depth.	0-10.	9 A.M. 9 P.M.	
		Barometer. * No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.	Max. No.	Min. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.							No. 3 inches.	No. 12 inches.								No. 22 inches.
		No.	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
1	30.326	54	30.280	62	58.5	33.0			44.0	40.5	42.0	44.0		2	11			0	1	41.5	42.5			43.7						1					
2	30.246	56	30.174	62	57.0	34.0			45.0	43.0	48.0	45.0		2	11			2	12	43.0	43.5			44.4						2					
3	30.216	57	30.230	58	60.8	36.0			46.0	43.0	46.0	43.0		2	2			8	8	42.0	43.5			44.8						3					
4	30.322	58	30.150	63	60.0	36.0			45.0	42.0	49.0	45.0		2	2			8	6	42.0	42.0									4					
5	30.150	59	30.010	59	56.0	40.5			48.0	45.0	46.0	42.0	105	11	11			6	6	45.0	44.0									5					
6	29.870	59	29.530	59	56.0	43.0			49.0	45.0	48.0	44.0		11	11			9	6	45.0	46.0									6					
7	29.250	57	29.650	57	57.0	41.0			47.0	43.0	44.0	40.0		11	11			8	8	46.0	46.0									7					
8	29.650	50	29.910	58	47.0	36.0			44.0	39.0	42.0	37.0		11	11			4	6	42.0	44.0									8					
9	29.930	50	29.820	58	47.5	38.0			41.5	36.0	40.0	36.0		11	8			8	8	43.0	43.0									9					
10	29.882	52	29.964	58	44.0	37.0			41.0	36.0	42.0	37.0		11	11			9	5											10					
11	30.004	52	29.980	58	48.5	35.0			42.0	37.0	40.0	36.0		11	11			5	6	40.0	43.0			43.0						11					
12	29.882	50	29.820	56	47.0	35.0			40.0	37.0	37.0	34.5		8	11			6	5	41.0	42.5			43.3						12					
13	29.760	54	29.716	58	47.5	28.0			38.0	36.0	36.0	33.0		8	8			6	0	40.5	42.0			44.0						13					
14	29.730	53	29.750	58	53.0	32.0			43.0	40.5	42.0	39.0		8	11			10	10	41.0	43.0			44.1						14					
15	29.720	56	29.752	62	47.0	36.5			43.5	40.5	42.0	39.0		11	8			8	10	42.0	43.0			44.0						15					
16	29.720	56	29.750	60	45.0	42.0			45.0	43.0	45.0	42.0		11	8			9	10	43.0	43.0			44.0						16					
17	29.800	56	29.882	56	44.5	43.0			44.0	42.0	42.0	41.0		8	8			9	10	42.5	43.0			43.4						17					
18	29.972	56	30.060	56	46.0	41.0			42.0	40.0	41.0	38.0		8	8			9	10	42.5	43.0			43.8						18					
19	30.060	54	30.120	54	46.0	35.0			44.0	39.0	39.0	38.0		8	8			5	8	43.0	43.0									19					
20	30.146	57	30.110	60	53.5	37.0			46.0	39.5	47.0	45.0		11	11			9	10	42.0	43.0			44.1						20					
21	29.916	58	29.880	62	60.0	46.0			52.0	47.5	52.0	46.5	0.12	11	11			6	9	46.0	44.5			45.0						21					
22	29.680	60	29.654	60	53.5	47.0			49.5	45.0	47.0	44.0	0.04	11	11			5	5					44.1						22					
23	29.686	60	29.770	62	53.0	43.0			50.0	45.0	45.0	42.0	0.01	11	11			4	6	45.5	45.5									23					
24	29.644	58	29.570	60	52.0	44.0			46.0	43.5	43.0	48.5	0.03	11	11			9	9	46.0	46.0									24					
25	29.620	56	29.506	60	57.0	36.0			46.5	42.0	42.0	40.0	0.06	11	2			2	6	44.0	45.0			45.4						25					
26	29.712	56	29.804	60	52.0	35.0			46.0	43.5	47.0	43.0		11	11			3	8	42.5	44.5			45.8						26					
27	30.020	58	30.084	60	53.5	41.0			47.0	41.5	44.0	40.0		11	11			6	6					46.2						27					
28	30.004	56	29.906	60	53.5	34.0			45.0	39.0	46.0	43.0		11	8			5	9	45.0	45.5			46.8						28					
29	29.920	58	29.926	62	57.5	37.0			46.0	42.5	48.0	46.0	0.07	11	8			10	9	46.5	46.5			46.8						29					
30	30.020	62	30.050	65	65.0	46.0			53.0	50.0	55.0	48.0		11	11			8	9	48.0	47.0			47.8						30					
31																															31				
Sums.	1511	1674	1583	1723	1888	133.0			1110	1035	1110	1065	1330					195	213	1910	1865														
Means.	29.880	55.8	29.881	59.4	58.5	38.0			45.4	41.5	46.3	41.2						6.3	7	43.2	44.0			44.8											
+ Total Corrections for Instrumental Errors.																																			
+ Corrections for Diurnal Range.																																			
"Corrected Means."																																			
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					

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

<b>BAROMETER,</b> "corrected Mean" at 9 A.M., <i>minus</i> the Correction $\uparrow\uparrow$	=	29.806
for Temp. (Col. 2), = 29.880.....0.074.....		
<b>"Corrected Mean" of Barometer at 9 P.M., <i>minus</i> the Correction <math>\uparrow\uparrow</math></b>	=	29.813
for Temp. (Col. 4), = 29.894.....0.081.....		
<b>Mean at Station, corrected, and at 32°,.....</b>	=	29.810
Correction for height, feet above Mean Sea-level,.....	=	22
<b>Mean, reduced to 32°, and Sea-level, .....</b>	=	29.832
Highest Reading, corrected for Index error, on the 1 th,.....	=	30.326
Lowest Do. Do., on the 7 th,.....	=	29.250
Difference, or <b>Monthly Range,</b> .....	=	1.076

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 30th, ..... = 65.0

Lowest in Month, corrected for Index errors, on the 19th, ..... = 28.0

Difference, or **Monthly Range**, ..... 37.0

"Corrected Mean" of all the Highest, (Col. 5), ..... = 52.3

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

Difference, or Mean Daily Range, ..... = 14.2

\*\* Calculated Mean Temperature of Month, ..... 45.2

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), ..... 44-9

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

10 and 12), ..... = 41-4

Computed Temperature of Dew-Point, ..... 37.3

Do. Elastic Force of Vapour, ..... = . 223

### ¶ Do. Weight of Vapour in a Cubic Foot of Air,

Relative Humidity (Saturation = 100), ..... = 75.

RAIN fell on 7 Days; Amount in Inches, ..... = 1.61

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	4	1	6	3		6	4	2	4		
P.M.	1	3	4	3		1	6	4	3		
Mean.	2	2	7	3	5	4	5	3	4		

Observations made and	}
Return verified by	

(Signed)







## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glasgow, County of North Lothian, in Lat. 55° 45' N, Long. 4° 15' W, Distance from Sea 0 miles.  
Height of Cistern of the Barometer above Mean Sea-Level 0 feet, above Ground 0 feet. During the MONTH of May 1890.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE.  H.ours.	THERMOMETERS under Ground.			SEA.  Temperature at 1 fathom, and Density.	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, including Thunder and Lightning, 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. Max. in Min. on Sunrises Grass.		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.				9 A.M. 9 P.M.									
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	No.	No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No. of hours in which it fell.	Amount in inches.	Direction.	Force.	Direction.	Force.	Velocity (0-6) and Direction.	Amount (0-10) and Species.		Velocity (0-6) and Direction.	Amount (0-10) and Species.	No.		No.	No.			Temperature of Wet Bulb at depth of feet, No.	0-10.				
		* No.		No.		No.	No.	No.	No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No.	No.	No.	No.	No.	No.	No.	No.		No.	No.	No.		No.	No.			No.	No.	No.	No.	No.	No.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°		°	°	°	°	°	°	°	°		°	°	°		°	°			°	°	°	°	°	°
	1	30.126	62	30.072	62	64.0	45.0			52.0	48.0	47.0	46.0	0	2	16			0	10			50.5	48.5		48.1						1					
	2	29.940	58	29.910	60	58.5	39.0			50.5	47.0	45.0	45.0	0.04	2	SW			1	8			48.5	48.0		48.8						2					
	3	29.920	62	29.830	60	65.5	49.0			57.0	48.0	48.0	44.0		2	2			6	6			57.0	49.5		48.8						3					
	4	29.860	60	29.830	62	50.0	40.			48.0	46.0	47.0	46.5		6	16			8	9			50.0	48.5		49.0						4					
	5	29.800	62	29.766	60	52.0	46.0			49.0	47.5	48.0	47.5	0.05	16	16			9	10			50.0	50.0		49.2						5					
	6	29.740	58	29.750	62	54.0	46.0			48.0	47.5	48.0	47.0		16	16			10	10			50.0	50.0								6					
	7	29.750	57	29.790	58	49.0	43.0			46.5	46.0	45.0	44.5	0.16	16	16			10	9			49.0	49.5		49.0						7					
	8	29.830	56	29.870	60	52.0	44.0			45.0	44.8	49.0	48.5		16	7			10	9			49.0	49.5		49.0						8					
	9	29.820	56	29.734	60	51.5	45.0			48.5	47.0	48.0	47.5	0.04	16	16			9	10			50.0	49.0		49.8						9					
	10	29.650	60	29.570	60	57.0	45.0			47.0	44.0	48.0	47.0	0.30	16	16			10	10			48.5	48.5								10					
	11	29.580	56	29.610	59	49.0	46.0			47.0	46.5	49.0	48.0		16	16			9	10			49.5	49.5		49.5						11					
	12	29.570	60	29.590	60	63.0	45.0			57.0	52.0	51.5	50.0		SW	2			10	8			49.0	48.0								12					
	13	29.650	59	29.660	63	62.0	42.0			55.0	51.0	52.0	46.0		W	2			8	6			52.0	50.0								13					
	14	29.676	62	29.830	62	60.0	44.0			52.0	46.5	46.0	43.0	0.05	SW	W			6	4			52.0	50.5								14					
	15	29.580	62	29.920	62	59.0	40.0			52.0	46.0	50.0	46.0	0.15	SW	W			8	6			50.0	49.5		50.5						15					
	16	29.896	62	29.720	63	58.0	45.0			52.0	48.0	57.0	45.0	0.12	SW	SW			9	10			50.0	49.5		50.2						16					
	17	29.460	63	29.688	63	63.5	50.0			57.5	53.0	48.0	45.5	0.05	SW	SW			5	5			53.0	57.0		50.6						17					
	18	29.786	62	29.830	60	61.0	47.0			56.0	50.0				SW	SW			8	8												18					
	19	29.900	63	29.880	60	50.0	49.0			50.0	47.0	49.0	47.0		SW	SW			9	9			52.0	57.5								19					
	20	29.796	62	29.320	62	61.0	48.0			44.0					SW	SW			7	5			50.0	57.5								20					
	21	29.810	60	30.210	62	63.0	49.0			58.0	53.0	57.0	55.0	0.06	SW	2			5	4			52.0	57.5								21					
	22	30.330	60	30.350	60	63.0	53.0				54.0	53.0			2	2			4	6			55.0	52.0								22					
	23	30.350	62	30.320	60	64.5	42.0			60.0	56.0	57.0	52.0		2	SW			6	0			57.0	57.0								23					
	24	30.346	62	30.270	60	57.0	49.			52.0	57.0	57.0	50.0		16	16			2	10			55.0	54.0								24					
	25	30.196	60	30.208	58	52.0	46.			47.0	46.0	48.0	44.0		16	16			9	2			52.0	54.5								25					
	26	30.172	57	30.146	58	54.0	46.0			57.0	46.0	48.0	44.0		16	16			6	2			57.0	52.5								26					
	27	30.140	58	30.140	58	58.5	39.0			57.0	44.0	48.0	44.0		16	2			1	2			53.0	52.0								27					
	28	30.160	58	30.112	60	69.0	42.0			58.0	52.0	52.0	46.0		2	W			6	6			53.0	52.5								28					
	29	30.332		30.232		45.0				54.0	50.0				W	SW			8	6			53.0	57.5								29					
	30	250		30.170										0.26																			30				
	31	291		300										1.1																			31				
Sums.		1743		1512		113	15			132	132	14	132		12	8							1428	1428		85											
Means.		29.903	60.0	29.890	60.6	57.8	45.3			51.5	48.8	49.3	47.9										57.4	50.9		49.1											
+ Total Corrections for Instru- mental Errors.																																					
+ Corre- ctions for Diurnal Range.																																					
"Cor- rected Means."																																					
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						

NOTATION USED IN GENERAL REMARKS.					
a.	denotes aurora.	m.	denotes meteor.		
ci.	" cirrus.	ns.	" nimbus.		
ci.-cu.	" cirro-cumulus.	n.	" rain.		
ci.-s.	" cirro-stratus.	r.	" heavy rain.		
cu.	" cumulus.	c. h. r.	" confined heavy rain.		
cu.-s.	" cumulo-stratus.	s.	" stratus.		
d.	" dew.	sc.	" scud.		
f.	" fog.	s.	" sleet.		
fr.	" frost.	s.	" snow.		
h.-fr.	" hoar-frost.	so. ha.	" solar halo.		
h.	" haze.	sq.	" squall.		
h. d.	" heavy dew.	sq.s.	" squalls.		
l.	" hail.	t.	" thunder.		
li. cl.	" lightning.	t. s.	" thunder-storm.		
li. sh.	" light showers.	w.	" wind.		
lu. co.	" lunar corona.	z.	" gale of wind.		
lu. ha.	" 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  $\ddagger$  for Temp. (Col. 2), = 29.903.....0.84..... = 29.819  
"Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\ddagger$  for Temp. (Col. 4), = 29.890.....0.87..... = 29.803  
Mean at Station, corrected, and at 32',..... = 29.811  
Correction for height, feet above Mean Sea-level,..... = 22  
Mean, reduced to 32', and Sea-level,..... = 29.833  
Highest Reading, corrected for Index error, on the 22 th,..... = 30.350  
Lowest Do. Do., on the 26 th,..... = 29.320  
Difference, or Monthly Range,..... = 1.030

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 28 th,..... = 69.0  
Lowest in Month, corrected for Index errors, on the 2 th,..... = 39.0  
Difference, or Monthly Range,..... = 30.0  
"Corrected Mean" of all the Highest, (Col. 5),..... = 52.8  
"Corrected Mean" of all the Lowest, (Col. 6),..... = 45.3  
Difference, or Mean Daily Range,..... = 12.5  
\*\* Calculated Mean Temperature of Month,..... = 57.6  
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),..... = 50.4  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12),..... = 48.2  
Computed Temperature of Dew-Point,..... = 45.9  
Do. Elastic Force of Vapour,..... = .310  
Do. Weight of Vapour in a Cubic Foot of Air,..... =  
Relative Humidity (Saturation = 100),..... = .85  
RAIN fell on 11 Days; Amount in Inches,..... = 1.28

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.			13	1	3	3	2			6	
P.M.			13	1	3	1	2	3		6	
Mean.		0	13	1	2	2	3	3	0	7	

Observations made and  
Return verified by

(Signed)

Robert Muirhead







SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Joppa, County of Mad. Colman, 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 18890

The Hours of Observation are of Greenwich Time.

[illegible]

**BAROMETER,** "Corrected Mean" at 9 A.M., <sup>868</sup> minus the Correction  $\frac{1}{11}$  = 29.738 765  
 for Temp. (Col. 2), = ~~29.822~~ <sup>868</sup> ..... ~~095~~ .....

"Corrected Mean" of Barometer at 9 P.M., <sup>804</sup> minus the Correction  $\frac{1}{11}$  = 29.752 782  
 for Temp. (Col. 4), = ~~29.852~~ <sup>804</sup> ..... ~~100~~ .....

**Mean at Station, corrected, and at 32',** ..... = 29.745 774  
 Correction for height, feet above Mean Sea-level, ..... = 22

**Mean, reduced to 32', and Sea-level,** ..... = 29.767 796

Highest Reading, corrected for Index error, on the 8<sup>th</sup>, ..... = 30.298

Lowest Do. Do. on the 15<sup>th</sup>, ..... = 29.150

Difference, or **Monthly Range,** ..... = 1.148

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 4<sup>th</sup>,..... =

Lowest in Month, corrected for Index errors, on the 25 <sup>th</sup> , .....	=	42-0
Difference, or Monthly Range, .....	=	32-0
"Corrected Mean" of all the Highest, (Col. 5), .....	=	64-6
"Corrected Mean" of all the Lowest, (Col. 6), .....	=	51-3
Difference, or Mean Daily Range, .....	=	13-3
** Calculated Mean Temperature of Month, .....	=	58-0

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

"Corrected <b>Mean</b> ," (Col. 7), of <b>Black Bulb, Max. in Sun</b> , .....	=
<b>Lowest at Night</b> , Black Bulb (corrected for Index errors), on the    th, .....	=
"Corrected <b>Mean</b> ," (Col. 8), of <b>Black Bulb, Min.</b> on grass, .....	=

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), ..... = 56.4

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), 54.0

\* Computed Temperature of Dew-Point, ..... = 51.3

Do. Elastic Force of Vapour, ..... = 378

Do. Weight of Vapour in a Cubic Foot of Air

Relative Humidity (Saturation = 100), ..... 82

RAIN fell on 14 Days; Amount in Inches, 3.40

WIND.		SUMMARY.									Mean Force.	Mean Velocity in miles per day.
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.			
A.M.	3	4		1	2	6	6	1	5			
P.M.	2	5	1		1	3	3	2	9			
Mean.	3	5	1	1	2	5	5	2	7			

Observations made on  
Return verified by

(Signed)







# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Goppa, County of West Lottman, 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 1890.  
The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER, “corrected Mean” at 9 A.M., <i>minus</i> the Correction $\frac{+}{-}$		
for Temp. (Col. 2), =	<u>30.080</u>	<u>095</u>
		<u>29.985</u>
“Corrected Mean” of Barometer at 9 P.M., <i>minus</i> the Correction $\frac{+}{-}$		
for Temp. (Col. 4), =	<u>30.080</u>	<u>103</u>
		<u>29.977</u>
Mean at Station, corrected, and at 32', .....		<u>29.981</u>
Correction for height, feet above Mean Sea-level, .....		<u>22</u>
Mean, reduced to 32', and Sea-level, .....		<u>30.003</u>
Highest Reading, corrected for Index error, on the 7 th, .....		<u>30.510</u>
Lowest Do. Do., on the 30 th, .....		<u>29.420</u>
Difference, or Monthly Range, .....		<u>1.090</u>

\* 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 Maker may be here given.

† Embracing corrections for both clarity and Index Error.

‡ The Diurnal Range for Scotland is as yet unknown.

§ Practically, though not absolutely a mean correction.

|| These “Hygrometrical Deductions” are calculated from Glaisher’s Hygrometrical Tables, Second Edition 1846.

\*\* While the Diurnal Range is unknown, the Arithmetic Mean of Cols. 5 and 6 will be entered as the “Calculated Mean Temperature.” Any variations 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 name of the Observer, in the Margin.

<b>S.-R. THERMOMETER,</b> (in shade, etc.), <b>Highest</b> in Month, (corrected for Index Errors), on the 8 <sup>th</sup> ,.....	=	75.0
<b>Lowest</b> in Month, corrected for Index errors, on the 13 <sup>th</sup> , .....	=	43.0
Difference, or <b>Monthly Range</b> , .....	=	32.0
" Corrected <b>Mean</b> " of all the <b>Highest</b> , (Col. 5), .....	=	66.0
" Corrected <b>Mean</b> " of all the <b>Lowest</b> , (Col. 6),.....	=	51.4
Difference, or <b>Mean Daily Range</b> ,.....	=	14.8
<b>** Calculated Mean Temperature</b> of Month, .....	=	58.8
<hr/>		
<b>S.-R. THERMOMETER, Black Bulb in Sun, Highest</b> , (corrected for Index Errors), on the 1 <sup>st</sup> ,.....	=	75.0
" Corrected <b>Mean</b> ," (Col. 7), of <b>Black Bulb, Max. in Sun</b> , .....	=	66.0
<b>Lowest</b> at Night, Black Bulb (corrected for Index errors), on the 13 <sup>th</sup> , .....	=	43.0
" Corrected <b>Mean</b> ," (Col. 8), of <b>Black Bulb, Min.</b> on grass,.....	=	51.4
Difference of above means or range ("exposed"), .....	=	14.8

<b>HYGROMETER, Mean</b> (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), .....	=	57.4
<b>Mean</b> (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), .....	=	57.7
†† Computed Temperature of Dew-Point, .....	=	52.3
†† Do. Elastic Force of Vapour, .....	=	39.8
†† Do. Weight of Vapour in a Cubic Foot of Air, .....	=	
†† Relative Humidity (Saturation = 100), .....	=	83
<b>RAIN</b> fell on // Days; Amount in Inches, .....	=	0.60

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day
A.M.				5	2	6	5		10		
P.M.				4	1	5	6		12		
Mean.	0	0	0	5	2	5	6	0	11		

Observations made and  
Return verified by



# FOR TAKING METEOROLOGICAL

The Council of the Society recommend that the Wet-Bulb-Thermometer, and the Dry and Wet Bulb-Hygrometer, be kept in Svensson's Louvre-mounted Box for Thermometers painted white inside and outside, and Thermometers served out of stout posts, also painted white, firmly fixed in the ground. The posts must be of such a length that the Thermometers are lying in position the Bulbs of the Minimum Thermometer, and of the Dry and Wet Bulb Thermometers, will be exactly at the same height of FOUR FEET above the ground, the Maximum Thermometer being hung immediately above the Minimum Thermometer. The Thermometer Box is to be placed over a plot of grass and in a free open space to which the sun's rays have free access during as much of the day as surrounding conditions enable the Observer to assure. The thermometers are suspended on cross-laths in the centre of the Box, and the door, which should open to the north.

The Council regard the question of integrity of the height ABOVE GROUND, AND METHOD IN PROMOTING THE THERMOMETERS, as a matter of the highest importance, and have accordingly decided to visit in every season of Meteorological Observation, since Win-

ent in Observations made at different Stations are incompatible with this rendering it impossible to compare the Climates of places with each other as regards that most important feature.

Professor Phillips and Negretti and Zambri's Maximum Thermometer, and the aneroid barometer, are the only instruments of the kind recommended. It is recommended that these Thermometers be graduated on the gas scale. The Minimum Thermometer is made on the Fahrenheit scale, the thermometer being constructed and lodged at the top of the tube. This arrangement is of occasional convenience with protected Thermometers, but of no frequent coincidence with exposed Thermometers. Hence a satisfactory examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

Fortunately, Spirit Thermometers may be easily set right by

any one, when the column of spirit chances to separate. Let the Thermometer be taken in the hand by the end farthest from the bulb, raised above the head, and then forcibly swung down towards the feet; the object being, on the principle of centrifugal force, to send down the detached portion of spirit till it unites with the column. A few throws, or swinging strokes, will generally be

sufficient for the purpose, after which the Thermometer should be placed in a slanting position, to allow the rest of the spirit to slide along the sides of the tube to the column. But if the thermometer has another method must be adopted, if the portion of spirit in the top of the tube be small. Heat should be applied slowly and cautiously to the top end of the tube where the detached portion of spirit is, which, being turned into vapour by the heat, will condense on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for if this be done, the unbroken column will be broken, and the spirit will be lost. When the detached portion of heat is by bringing the end of the tube slowly down towards a heated flame from a gas-burner; or, if gas be not at hand, a piece of heated metal will serve instead.

The bulbs of the Thermometers for registering the greatest heat from the sun's rays, and the least from radiation

**Black-Bulls.**—Black-bulls, which may easily be made, or mented, by the application of a mixture of lampblack and printer's ink. They are placed in shallow blackened boxes, whose sides protect the bulls from the sun. The Maximum should be freely exposed to the sun, and the Minimum should rest on wooden supports a few inches from the surface of the glass, in an open situation. Snow must not be allowed to cover either of these Thermometers; nor the sun's heat to affect the Minimum Thermometer by distillation. Black-bulls enclosed in "glass jackets" may also be used, being indented, prebore to the

above. It must, however, be added, that the whole subject of the observation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

attached, the frame must be such as will bring ditches forward by an incl from any board on which it may be suspended; the water-beds must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but in no case under the bulbs; the muslin must be of medium fineness, and fastened at the neck of the bulb by the cotton, which also supplies it with water. It must be seen by the observer that the muslin is always clean and moist, and the water pure. In frosty weather, observations must be made much delicately, by immersion from 15 to 30 minutes before the hour of observation. From the film of ice thus formed evaporation will proceed as from the moist cloth in ordinary circumstances.

III. Reading the Thermometer. The eye exactly opposite the top of the index column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus, if the thermometer will read  $-39^{\circ}$ ,  $9^{\circ}$ ,  $40^{\circ}$ , or  $40^{\circ} \cdot 1$ ; or again,  $40^{\circ} \cdot 4$ ,  $40^{\circ} \cdot 5$ ,  $40^{\circ} \cdot 6$ , according as it indicates a little under, an exact coincidence with, or a little over  $40^{\circ}$ , it should be read  $40^{\circ} \cdot 0$ ,  $40^{\circ} \cdot 5$ , and  $40^{\circ} \cdot 6$ , respectively. So also if  $40^{\circ} \cdot 1$  and  $40^{\circ} \cdot 3$  more or less, must be registered  $40^{\circ} \cdot 2$ ,  $40^{\circ} \cdot 3$ , and  $40^{\circ} \cdot 4$ , or  $40^{\circ} \cdot 3$  respectively. In reading Rutherford's Minimum Thermometer, the indication of that end of the index which is next the surface of the spirit is alone noted. On opening the Thermometer Box, the Dry and Wet Bulb Thermometers are to be fixed, and rapidly, each of the Observers, they are readily affected by heat and cold.

The Hygrometer is read at 9 A.M. and 9 P.M. The Self-registering Thermometers are read at 9 A.M. only, as, in the hour of observing, the greatest and least degrees of temperature are obtained.

It is no matter in what position the thermometer is held, provided it is in the vertical position in the 24 hours preceding.

indifference when the Self-Registering Thermometers are read, since in winter at least the extremes may occur at any hour, and it is necessary to refer their occurrence to their proper meteorological position. In the Society's schedules, the indications registered on the 31st and 3d are those of a series of phenomena commencing at 9 p.m. on the 2d and extending till 9 p.m. on the 3d.

No instrument ought to be used for Meteorological purposes till it has been carefully tested by comparison with a standard Thermometer. When such Thermometers are not graduated on the stem, but merely on an attached scale, undergo repairs, they are very liable to be moved from their position on the Scale, and ought never afterwards to be used without being re-tested. The Self-Registering, especially the Minimum Thermometers, ought frequently to be compared with the dry bulb of the Hygrometer. The freezing-point of each Thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

In selecting instruments, the following points require attention:—The divisions of the venier of Barometers in reference to their scales, and the perfect freedom of the Barometer from air; the

water, in cases where the observations cannot be taken daily. An observation may be made on the 5th, 15th, and 25th of each month. When convenient, extra Sea Observations might be taken for other days and greater depths, noting also the Temperature of the Air and the Hour of Observation. It is also very desirable that observations on the daily Maxima and Minima by Thermometers continuously immersed, be stationed at points along the coast, by the method proposed by Mr. T. Stevenson, and already commenced at Petchhead and Liverpool.

The Temperature of the water at the bottom of Wells ought, when practicable, to be taken, both the depth of the water and the nature of the water being noted.

Mention will be made of the use of Test-Papers are used, Schloemann's or Moffatt's, etc. The Test-Paper is affixed by a pin to a board in the Thermostatic Bath. It is desired that these indications be witnessed and 9. p. n

**Atmospheric Electricity.**—The electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, thermometrical, and meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observation.

The horizontal column is unvariably too narrow. Some of the vertical columns are also too narrow. The horizontal column, visible, observations, that can be taken are

**Remarks.** Those for which no rules can be given are marked as assigned. The use of combinations can be given no rules, for every advantage of, and of such as are in general, to be taken at the foot of the column, except in a few cases, to be noted in the margin. Differences in character, colour, velocity, and direction, are marked in the margin. The colour of the sky, etc. Remarks ought to be made on the occurrence of Meteors, Auroræ Boreales, remarkable depressions, and fluctuations of the Barometer, Thunder-storms, and remarkable falls of Snow, Hail,

of the Barchan, and the snow-covered slopes of the dunes of the Snowline. The height of the Snowline is noted on Storms as having been at a maximum, and ending, as well as such, on Storms as have been noted above. When lofty hills are in the vicinity of a Station, the Heights of Clouds and of the Snowline in winter should be recorded. By the use of abbreviations, the state of the weather at 4 a.m. and 9 p.m. should be registered, either in two columns, otherwise uncoupled, or rilled off for the purpose, from the column of 'Remarks'. Observations in connection with the Periodic Return of the Observations in Seasons, possess not only great scientific value, but are also of considerable importance in connection with the study of Agriculture, Horticulture and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena so 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 on a selected piece of ground or farm. The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed.

The Council recommend Observers, before purchasing new instruments, and in teaching old ones, to communicate with the Meteorological Secretary, in order that every instrument may be examined and improved before being used, and they consider it necessary 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. 1

Edinburgh, December 1888.

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	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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[illegible][illegible]

Barley,	.. .
Bare or Bigg,	.. .
Oats,	.. .
Wheat,	.. .
Beans,	.. .
Pease,	.. .
Potatoes,	.. .
Turnips,	.. .
Rye Grass,	.. .
CROPS, mentioning variety.	

[illegible][illegible]

OBSERVATION		FOREST TREES.	
1		Alder,	.....
2		Ash,	.....
3		Beech,	.....
4		Birch,	.....
5		Elm,	.....
6		Larch,	.....
7		Lime,	.....
8		Oak,	.....
9		Sycamore or Plane,	.....

1890  
Sept.

To the *SECRETARY*

*Scottish Met*

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BOOK POST.

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122

*Medical Society of the State of New York*  
George



SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripen generally.	MIGATORY BIRDS.	First Arrival.	Departure.
.....	Apple,	.....	.....	.....	Cuckoo, .....	.....	.....
.....	Black Currant,	.....	.....	.....	Curlew, .....	.....	.....
.....	Cherry, .....	.....	.....	.....	House-Swallow, .....	.....	.....
.....	Gean, .....	.....	.....	.....	Lapwing, .....	.....	.....
.....	Gooseberry, .....	.....	.....	.....	Plover, .....	.....	.....
.....	Peach, .....	.....	.....	.....	Sand-Martin, .....	.....	.....
.....	Plum, .....	.....	.....	.....	Starling, .....	.....	.....
.....	Strawberry, .....	.....	.....	.....	Swan, .....	.....	.....
.....	.....	.....	.....	.....	Rail or Corn Crake, .....	.....	.....

[illegible]

First Cut  
or Raised.

[illegible][illegible][illegible][illegible][illegible]

OBSERVATION		FOREST TREES.	
1		Alder,	.....
2		Ash,	.....
3		Beech,	.....
4		Birch,	.....
5		Elm,	.....
6		Larch,	.....
7		Lime,	.....
8		Oak,	.....
9		Sycamore or Plane,	.....



## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Joppa, 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 1890.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE. Hours.	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, including Thunder and Lightning, 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.												
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sun/shade.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No. of hours in which it fell.	Amount in inches.	Direction.	Force.	Direction.	Force.	Velocity (0—10), and Direction.	Amount (0—10), and Direction.		Velocity (0—10), and Direction.	Amount (0—10), and Direction.	No. 3 inches.					No. 12 inches.	No. 22 inches.				
		* No.		No.		No.	No.	No.	No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No.	No.																			9 A.M.	P.M.
		inches.	°	inches.	°																															
	1	29.390	60	29.440	60	56.0	42.0			53.0	50.0	47.0	42.	0.13	SH	X				1	10			53.0	53.0			52.3		1						
	2	30.270	56	30.140	63	60.0	39.0			46.0	40.0	50.0	48.0	0.02	W	W				0	10			48.0	51.5			52.2		2						
	3	29.872	62	29.932	68	61.0	46.0			60.0	53.5	57.0	57.0	0.06	SH	S				4	2			51.0	51.0			53.1		3						
	4	30.042	65	30.060	68	62.5	56.0			57.0	52.0	60.0	58.0	0.01	W	SH				2	9			54.5	52.5			53.4		4						
	5	29.942	65	29.846	70	64.5	57.0			60.0	57.5	57.0	58.0	0.02	SH	SH				9	10			58.5	53.5			54.6		5						
	6	29.850	63	29.966	68	57.5	57.0			53.0	49.0	50.0	46.0	0.03	W	W				2	8			57.0	54.5			54.7		6						
	7	29.936	63	30.208	61	56.0	46.0			50.0	48.0	52.0	47.0		SH	W				10	0			57.5	53.0			53.8		7						
	8	30.490	58	30.500	61	57.5	40.0			46.0	44.5	45.0	43.0		W	W				4	—			48.5	57.5			53.8		8						
	9	30.350	57	30.350	64	62.0	40.0			53.0	50.0	56.0	—		W	W				3	5			49.0	51.5					9						
	10	30.230	58	30.230	68	64.0	54.0			60.0	57.0	59.0	56.0		S	S				4	8			53.0	52.0					10						
	11	30.220	61	30.350	70	63.0	52.0			58.0	56.0	60.0	58.0		S	W				5	3			52.0	52.0			53.8		11						
	12	30.330	65	30.310	69	65.0	55.0			60.0	57.0	57.0	57.0		W	W				6	3			56.0	57.0					12						
	13	30.310	63	30.250	67	57.0	50.0			56.0	52.0	56.0	52.0		W	W				8	5			54.0	54.0					13						
	14	30.500	62	29.830	62	62.0	53.0			56.0	52.0	48.0	46.0		SH	W				8	—			53.0	53.5					14						
	15	29.160	57	29.310	59	57.0	45.0			48.0	45.0	45.0	43.0	0.23	SH	W				9	0			49.0	52.0					15						
	16	29.420	54	29.450	62	52.0	40.0			46.0	42.0	44.0	40.0	0.20	SH	SH				8	1			46.0	50.0					16						
	17	29.820	58	29.960	65	53.0	42.0			47.0	43.0	50.0	45.0		SH	SH				5	0									17						
	18	30.160	57	30.310	62	57.5	42.0			48.0	43.0	45.0	41.0		W	W				0	6			46.0	47.0					18						
	19	30.312	56	30.370	62	52.0	37.0			42.5	39.0	44.0	42.0	0.10	W	W				10	10			43.5	46.5			50.2		19						
	20	30.282	58	30.270	65	50.0	40.0			44.0	42.5	48.0	44.5		W	W				10	10			45.0	46.5			49.8		20						
	21	30.340	60	30.450	63	52.0	44.0			50.0	49.5	50.5	50.0	0.04	W	W				10	10			47.0	47.0			50.1		21						
	22	30.496	60	30.530	65	57.0	49.0			52.0	50.5	53.0	57.0		W	W				9	4			48.0	48.0			50.7		22						
	23	30.566	62	30.300	65	56.0	51.0			52.0	52.0	53.0	50.0		SH	W				5	6			49.5	49.0			50.8		23						
	24	29.976	62	29.882	58	58.0	52.0			56.0	52.5	48.0	44.0		SH	W				2	6			50.0	49.5			50.7		24						
	25	29.710	59	29.420	53	48.0	45.0			48.0	46.0	48.5	38.0		W	W				10	10			48.0	50.0					25						
	26	29.450	50	29.450	46	44.0	32.0			38.0	36.0	40.0	—	0.60	W	W				4	3			44.0	48.0					26						
	27	29.910	43	30.010	50	40.5	35.0			37.0	37.0	32.0	—	0.30	W	W				2	0			41.0	45.0					27						
	28	30.030	48	29.704	58	54.5	31.0			36.0	34.0	35.0	25.0	0.52	W	W				5	8			37.0	43.5			42.4		28						
	29	29.560	56	29.992	55	58.0	36.0			52.0	52.0	48.0	45.0		S	W				9	0			45.0	44.0			48.0		29						
	30			29.866	62	57.0	36.0			39.0	37.0	44.0	44.0	0.62	W	W				10	10			43.0	45.0			48.2		30						
	31	29.466	58	29.524	62	57.0	38.0			49.5	49.0	48.0	46.0	0.42	W	W														31						
	Sums.	400.660	1154	301.170	1141	57.0	40.5			50.0	48.5	54.0	52.0	3.10						49.9	15.7			48.0	49.0			46.1								
	Means.	30.022	58.5	30.049	62.8	57.6	44.9			50.3	49.3	49.8	47.8							6.6	5.9			48.9	49.9			52.3								
	+ Total Corrections for Instrumental Errors.																																			
	+ Corrections for Diurnal Range.																																			
	+ "Corrected Means."																																			
	No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					

NOTATION USED IN GENERAL REMARKS.					
a.	denotes aurora.	m.	denotes meteor.		
ci.	" cirrus.	ma.	" meteor.		
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.	" stratus.		
f.	" fog.	sc.	" scud.		
fr.	" frost.	s.	" sleet.		
h.-fr.	" hoar-frost.	s.	" snow.		
h.	" haze.	so. ha.	" solar halo.		
h. d.	" heavy dew.	sq.	" squall.		
h. l.	" hail.	sq.	" squalls.		
l.	" lightning.	t.	" thunder.		
li. cl.	" light clouds.	t. s.	" thunder-storm.		
li. sh.	" light showers.	w.	" wind.		
lu. co.	" lunar corona.	g.	" gale of wind.		
lu. ha.	" 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
0-3	Very light air	2	Fresh breeze	5	Blowing a gale
1	Light air	3	Very fresh	6	Violent gale

## NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	" "	ms.	" "
ci.-cu.	" "	n.	" "
ci.-s.	" "	r.	" "
cu.	" "	h. r.	" "
cu.-s.	" "	c. h. r.	" "
d.	" "	s.	" "
f.	" "	sc.	" "
fr.	" "	s.	" "
h.-fr.	" "	so. ha.	" "
h.	" "	sq.	" "
h. d.	" "	sq. h.	" "
h. l.	" "	sq. s.	" "
l.	" "	th.	" "
li. cl.	" "	th. s.	" "
li. sh.	" "	w.	" "
li. co.	" "	g.	" "
li. ha.	" "		" "

## 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  $\frac{1}{100}$  for Temp. (Col. 2), = 30.021..... 29.942  
"Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\frac{1}{100}$  for Temp. (Col. 4), = 30.004..... 29.911  
Mean at Station, corrected, and at 32°, = 29.926  
Correction for height, feet above Mean Sea-level, = 2.2  
Mean, reduced to 32°, and Sea-level, = 29.948  
Highest Reading, corrected for Index error, on the 23 th., = 30.566  
Lowest Do. Do., on the 15 th., = 29.160  
Difference, or Monthly Range, = 1.406

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 12 th., = 65.0  
Lowest in Month, corrected for Index errors, on the 26 th., = 31.0  
Difference, or Monthly Range, = 34.0  
"Corrected Mean" of all the Highest, (Col. 5), = 55.6  
"Corrected Mean" of all the Lowest, (Col. 6), = 44.9  
Difference, or Mean Daily Range, = 10.7  
\*\* Calculated Mean Temperature of Month, = 50.2

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), = 50.0

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 47.6

Computed Temperature of Dew-Point, = 45.1

Do. Elastic Force of Vapour, = 300

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

Relative Humidity (Saturation = 100), = 84

RAIN fell on 15 Days; Amount in Inches, = 3.10

WIND.		SUMMARY.			
Direction.	N	NE	E	SE	S
A.M.	3			3	10
P.M.	4	1		3	12
Mean.	3	1	0	3	6

Observations made and  
Return verified by

(Signed) Robert Muirhead







## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Yokapu, County of Midlothian, 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 1890.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				Rain.		WIND.				CLOUDS.				THERMOMETERS under Ground.				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.		No. of hours in which it fell.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.							
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. No.	Min. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	No.	Amount in inches.	Direction.	Force.	Direction.	Force.	Amount (0-10).	Amount (0-10).	Amount (0-10).	Amount (0-10).	No. 3.	No. 12.	No. 22.	No. 3.					No. 12.	No. 22.
		* No.	inches.	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"					"	"
	1	29.726	57	29.524	60	33.042	0			46.544	0	48.045	0	0.26	h	SW			5	9			45.0	45.0									
	2	29.854	58	29.802	60	37.044	0			48.046	0	45.042	0		h	N			8	9			46.5	45.5			48.7						
	3	29.550	50	29.270	58	43.535	0			37.535	0	44.042	0	0.04	S	2			8	9			43.0	46.0									
	4	29.182	58	29.404	60	57.037	0			40.039	0	43.041	0		2	W			6	9			41.0	44.0									
	5	29.572	54	29.810	58	43.039	0			48.044	0	45.044	0		h	h			4	10			42.0	43.5									
	6	29.684	46	29.884	60	48.040	0			42.040	0	45.043	0	0.65	SE	SE			8	10			42.0	43.5									
	7	29.054	53	29.580	60	48.041	0			45.044	0	47.040	0	0.05	h	h			10	0													
	8	29.400	53	29.346	60	37.034	0			48.046	0			0.90	SE	SW			6	10			41.0	43.5									
	9	29.346	53	29.424	60	44.540	0			42.040	0	44.544	0	0.34	h	h			10	10													
	10	29.660	53	29.612	60	44.032	0			33.032	0	39.032	0	0.05	2	SE			0	0			40.0	43.0									
	11	29.392	54	29.570	60	45.033	0			43.040	0	38.032	0		SE	2			9	0			39.0	42.0									
	12	29.590	52	29.532	58	49.033	0			35.034	0	47.025	0	0.11	SE	SE			4	10			38.0	41.5									
	13	29.460	53	29.816	60	49.034	0			44.041	0	42.040	0		S	2			2	0			40.0	41.5									
	14	29.960	53	29.622	62	57.037	0			43.041	0	52.0	0	0.36	2	S			9	10			42.0	42.0									
	15	30.136	55	30.290	66	49.041	0			43.041	0	46.045	0		SW	S			0	2			42.0	42.0									
	16	30.164	52	30.210	63	44.034	0			38.037	0	40.040	0	0.10	SE	2			8	10			39.0	42.0									
	17	30.322	55	30.250	65	53.034	0			36.035	0	58.048	0		S	S			9	—			40.0	42.0									
	18	30.312	56	30.350	65	56.035	0			48.046	0	46.046	0	0.10	h	W			10	8													
	19	30.250	58	30.340	64	58.043	0			33.533	0	47.045	0	0.08	S	SW			8	6			45.0	43.0									
	20	30.370	58	30.270	67	57.043	0			48.047	0	48.046	0	0.03	SW	SW			6	—			45.0	44.0									
	21	29.880	60	29.880	67	53.044	0			54.052	0	42.040	0	0.09	SW	SW			10	0			48.0	46.0									
	22	29.830	56	29.400	65	52.045	0			45.043	0	53.051	0	0.14	SW	S			10	8			43.0	45.0									
	23	29.410	58	29.252	65	48.545	0			48.045	0	42.046	0	0.32	h	SW			10	10			42.0	46.0									
	24	29.660	53	29.620	58	42.039	0			40.036	0	53.045	0	0.12	h	h			2	2			43.0	45.0									
	25	29.920	53	30.280	58	41.035	0			38.037	0	53.045	0	0.03	6	8			8	2			40.0	43.0									
	26	30.280	52	30.360	57	36.032	0			34.037	0	28.528	0		2	h			6	—			38.0	42.0									
	27	30.284	50	30.264	55	32.026	0			29.0	—	32.032	0		h	—			—	—			32.0	38.0									
	28	30.270	46	30.284	53	38.028	0			29.528	0	30.028	0		2	2			5	8			36.0	38.0									
	29	30.234	50	30.146	54	44.025	0			30.029	0	32.032	0	0.25	S	S			2	8			35.0	38.0									
	30	29.952	50	29.920	50	52.528	0			44.042	0	48.046	0		S	S			9	8			35.5	38.5									
	31																																
	Sums.	894.144	1615	894.128	1640	54.053	0			45.547	0	48.048	0	4.02									43.0	43.5									
	Means.	29.855	53.8	29.832	60.0	47.9	36.5			41.8	40.5	48.5	40.9									43.2	43.4										
	+ Total Corrections for Instrumental Errors.																																
	+ Corrections for Diurnal Range.																																
	"Corrected Means."																																
	No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		

NOTATION USED IN GENERAL REMARKS.

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.	stratus.
f.	fog.	sc.	scud.
fr.	frost.	s.	sleet.
h. fr.	hoar-frost.	s.	snow.
h.	haze.	so. ha.	solar halo.
h. d.	heavy dew.	sq.	squall.
hl.	hail.	sqs.	squalls.
l.	lightning.	t.	thunder.
li. cl.	light clouds.	t. s.	thunder-storm.
li. sh.	light showers.	w.	wind.
li. co.	lunar corona.	g.	gale of wind.
li. ha.	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  $\frac{1}{100}$  for Temp. (Col. 2), = 29.737  
"Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\frac{1}{100}$  for Temp. (Col. 4), = 29.717  
Mean at Station, corrected, and at 32', = 29.727  
Correction for height, feet above Mean Sea-level, = 22  
Mean, reduced to 32', and Sea-level, = 29.749  
Highest Reading, corrected for Index error, on the 26th, = 30.380  
Lowest Do. Do., on the 6th, = 28.884  
Difference, or Monthly Range, = 1.496

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 14th, = 57.0  
Lowest in Month, corrected for Index errors, on the 30th, = 25.0  
Difference, or Monthly Range, = 32.0  
"Corrected Mean" of all the Highest, (Col. 5), = 47.9  
"Corrected Mean" of all the Lowest, (Col. 6), = 36.5  
Difference, or Mean Daily Range, = 11.4  
\*\* Calculated Mean Temperature of Month, = 42.2  
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 14th, = 57.0  
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 47.9  
Lowest at Night, Black Bulb (corrected for Index errors), on the 30th, = 25.0  
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 36.5  
Difference of above means or range ("exposed"), = 32.0

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 42.2  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 40.6  
†† Computed Temperature of Dew-Point, = 38.7  
†† Do. Elastic Force of Vapour, = 235  
†† Do. Weight of Vapour in a Cubic Foot of Air, = 88  
†† Relative Humidity (Saturation = 100), = 88  
RAIN fell on 19 Days; Amount in Inches, = 4.02

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	3	5	4	6	3	6		
P.M.	1	2	1	3	5	6	3	2	7		
Mean.	1	1	1	4	5	5	4	3	6		

Observations made and  
Return verified by

(Signed)

Robert Muirhead







## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glasgow, County of North Ayrshire, 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 1890.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE. H.ours.	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.  Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs, Read Daily, at 9 P.M.		9 h. A.M.		9 h. P.M.			No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer No. 1.	9 h. A.M.		P.M.	9 h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		Barometer. * No.	Attached Thermometer.	Barometer. No.	Attached 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—6) and Direction.	Amount (0—10), and Species.					Velocity (0—6) and Direction.	Amount (0—10), and Species.	No. 1.	No. 2.	No. 3.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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BAROMETER, "corrected Mean" at 9 A.M., minus the Correction  $\frac{1}{100}$  for Temp. (Col. 2), = 30.117.....0.61.....30.056  
"Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\frac{1}{100}$  for Temp. (Col. 4), = 30.139.....0.27.....30.062  
Mean at Station, corrected, and at 32°,.....30.059  
Correction for height, feet above Mean Sea-level,.....2.2  
Mean, reduced to 32°, and Sea-level,.....30.081  
Highest Reading, corrected for Index error, on the 30th,.....30.640  
Lowest Do. Do., on the 19th,.....29.344  
Difference, or Monthly Range,.....1.296

S.R. THERMOMETER, (in shade, etc.) Highest in Month, (corrected for Index Errors), on the 19th,.....57.0  
Lowest in Month, corrected for Index errors, on the 22nd,.....24.0  
Difference, or Monthly Range,.....33.0  
"Corrected Mean" of all the Highest, (Col. 5),.....39.6  
"Corrected Mean" of all the Lowest, (Col. 6),.....33.0  
Difference, or Mean Daily Range,.....6.6  
\*\* Calculated Mean Temperature of Month,.....36.3  
S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 19th,.....57.0  
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun,.....57.0  
Lowest at Night, Black Bulb (corrected for Index errors), on the 19th,.....24.0  
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass,.....24.0  
Difference of above means or range ("exposed"),.....33.0

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11),.....37.0  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12),.....35.4  
Computed Temperature of Dew-Point,.....33.2  
Do. Elastic Force of Vapour,.....1.89  
Do. Weight of Vapour in a Cubic Foot of Air,.....8.6  
Relative Humidity (Saturation = 100),.....86  
RAIN fell on 7 Days; Amount in Inches,.....1.53

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		3	2	6	3		4		2	11	
P.M.		2	5	11			5		7		
Mean.		3	2	8	2	0	5	0	1	9	

Observations made and  
Return verified by

(Signed)

Robert Muirhead



