

# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Aberdeen, County of Aberdeen, in Lat. 59° 7' N, Long. 2° 6' W, Distance from Sea 1 mile.  
 Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 24 feet. During the MONTH of January 1882.  
 The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.  As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.  Mention the hour at which Storms, 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. in Shade.	Min. on Ground.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	Readings of the H. Cup Anemometer. No. _____	No. of hours in which it fell.	No.	Amount in inches. (0—6), and Direction.	Amount (0—10), and Species.	Velocity (0—6), and Direction.	Amount (0—10), and Species.	No.	3 inches.					12 inches.	No.	22 inches.	
		* No.	inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°	°	°	°
	1	29.418	42.7	29.320	42.8	45.1	35.2			41.0	40.2	37.0	35.5	—	—	WS	1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1			
	2	29.134	42.0	28.720	44.1	45.0	35.0			40.0	38.5	43.0	42.1	W.	1	S.W.	1/2			0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2			
	3	29.364	41.1	29.260	42.2	44.2	34.0			38.0	35.6	39.9	33.5	N.W.	1/2	—	—			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3			
	4	29.654	38.0	29.536	39.9	44.3	24.0			31.2	29.8	37.8	36.2	—	—	W	2			0.41	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4		
	5	29.026	43.0	29.264	44.0	45.4	35.2			42.8	41.1	39.0	36.2	W	1	W	2			0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5		
	6	29.722	35.0	29.004	44.0	47.4	37.8			46.6	40.5	40.4	35.1	W.	3	W.	3			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6		
	7	29.214	34.0	29.324	41.0	47.0	32.2			34.9	33.1	35.2	32.2	W.	1	S.W.	2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7		
	8	29.600	42.0	29.516	42.5	44.2	34.0			38.5	36.2	36.7	31.8	W.	2	W.	1			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8		
	9	29.620	39.0	29.820	42.5	45.3	32.5			36.6	34.5	39.5	35.6	W.	1	S.W.	1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9		
	10	29.694	43.0	29.636	44.6	44.6	36.0			41.6	39.3	43.9	39.4	S.W.	2	W.	1 1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10		
	11	29.924	43.3	30.128	41.0	44.0	30.8			37.8	34.9	33.0	31.1	N.W.	1/2	—	—			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11		
	12	30.176	46.0	30.228	45.2	44.2	31.7			46.0	44.5	44.0	43.1	—	—	S.W.	1			0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12		
	13	30.188	45.0	30.190	45.6	44.5	40.7			45.0	43.9	45.1	43.4	S.	1 1/2	S.	1 1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13		
	14	30.276	45.2	30.308	46.2	44.5	41.5			44.8	43.1	46.0	45.0	S.W.	1/2	S.W.	1 1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14		
	15	30.388	48.5	30.472	47.6	44.6	43.4			49.2	47.0	48.2	46.3	S	2	S	1			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15		
	16	30.540	48.0	30.602	48.1	44.5	45.0			49.0	46.2	48.5	45.0	S	1	—	—			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16		
	17	30.592	43.0	30.664	47.0	48.0	36.5			37.1	36.0	46.6	43.4	S.W.	1/2	—	—			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17		
	18	30.730	46.0	30.718	44.1	50.1	42.0			43.1	40.1	48.1	44.8	S.W.	1/2	S.W.	1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18		
	19	30.730	45.0	30.658	47.6	49.9	29.6			42.0	39.1	44.3	41.2	W.	1/2	W.	1			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19		
	20	30.504	44.2	30.360	45.8	46.0	36.9			40.7	39.0	42.3	39.1	—	—	S.W.	1			0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20		
	21	30.516	40.5	30.436	42.0	47.6	34.2			36.5	35.0	38.0	36.8	S.W.	1/2	—	—			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21		
	22	30.244	46.4	30.238	46.2	46.3	36.6			46.1	43.0	44.2	42.0	S.	1/2	S.	1			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22		
	23	30.232	46.0	30.222	47.0	46.2	40.6			43.0	42.1	46.4	44.3	—	—	S.W.	1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23		
	24	30.328	46.5	30.360	48.0	54.6	41.2			46.0	44.2	46.3	44.2	S.W.	1	S.W.	1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24		
	25	30.412	45.6	30.476	45.0	51.1	34.0			43.3	41.8	40.8	39.3	S.W.	1/2	—	—			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25		
	26	30.380	46.0	30.200	43.0	43.0	33.2			38.0	36.1	39.6	37.2	S.W.	1 1/2	S.W.	1/2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26		
	27	30.074	44.4	29.832	45.9	45.7	37.5			44.2	42.0	45.8	45.2	S.W.	1/2	S.W.	2			0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27		
	28	29.856	45.0	30.038	44.0	46.7	34.0			42.0	42.0	38.8	35.2	W.	1	W.	1			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28		
	29	30.448	39.0	30.468	43.0	39.7	24.6			34.1	32.0	38.2	34.8	N.W.	1	N.W.	1			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29		
	30	30.552	42.0	30.536	41.9	40.1	33.9			38.4	34.0	39.0	35.0	2.	1	S.E.	1/2			0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30		
	31	30.578	43.4	30.532	42.6	42.1	34.3			41.4	38.8	40.6	39.1	S.	2	S.W.	2			0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31		
	Sums.	1414.12	15.4	1344.3	13.1	131.2	18.9	14.4		1276.7	129.16	128.08	121.9	6	5			28.0	28.5	9	1.00	172	132	105										
	Means.	30.444	42.4	30.488	44.6	47.0	36.3			41.2	39.0	41.6	39.3			0.95	0.95			5.5	4.3													
	† Total Corrections for Instrumental Errors.	30.037		30.041	44.5																													
	† Corrections for Diurnal Range.																																	
	"Corrected Means."	30.407	42.7	30.447	45.1	46.6	36.3			41.0	38.8	41.4	39.1																					
	No. of	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.	st.	stet.
h-fr.	hoar-frost.	s.	snow.
h.	haze.	sol. h.	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. h.	lunar halo.		

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction††) = 29.994  
 for Temp. (Col. 2), = 30.006  
 Corrected Mean" of Barometer at 9 P.M., minus the Correction††) = 29.992  
 for Temp. (Col. 4), = 30.008  
 Mean at Station, corrected, and at 32°, = 30.006  
 Correction for height, 66 feet above Mean Sea-level, = 0.072  
 Mean, reduced to 32°, and Sea-level, = 30.078  
 Highest Reading, corrected for Index error, on the 18th, = 30.736  
 Lowest Do. Do., on the 2nd, = 28.726  
 Difference, or Monthly Range, = 2.010

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 18th, = 54.6  
 Lowest in Month, corrected for Index errors, on the 4th, = 29.2  
 Difference, or Monthly Range, = 25.4  
 "Corrected Mean" of all the Highest, (Col. 5), = 46.6  
 "Corrected Mean" of all the Lowest, (Col. 6), = 36.3  
 Difference, or Mean Daily Range, = 10.3  
 \*\* Calculated Mean Temperature of Month, = 41.5  
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, = —  
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = —  
 Lowest at Night, Black Bulb, (corrected for Index errors), on the th, = —  
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = —  
 Difference of above Means or Range ("exposed"), = —

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 41.2  
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 39.05  
 ‡ Computed Temperature of Dew-Point, = 36.3  
 ‡ Do. Elastic Force of Vapour, = 2.13  
 ‡ Do. Weight of Vapour in a Cubic Foot of Air, = —  
 ‡ Relative Humidity, (Saturation = 100), = 83  
 RAIN fell on 9 Days; Amount in Inches, = 1.00

WIND.		SUMMARY.			
Direction.		N	NE	E	SE
A.M.	0	0	1	5	5
P.M.	0	0	0	1	3
Mean.	0	0	1	4	11

Observations made and Return verified by <







# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abden, County of Aberdeen, in Lat. 57° 7' N, Long. 2° 6' W, Distance from Sea 1 miles.  
 Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 24 feet. During the MONTH of February 1882.  
 The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. ———.				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.		OZONE.		GENERAL REMARKS.		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.		No. of hours in which it fell.	Amount in inches. and Direction.	9 A.M.		P.M.		9 h. A.M.		Temperature of Well at depth of 18 feet. No.	Temperature of Air at 1 foot. No.	0—10. ..... 0—10.	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.					
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. No.	Min. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.			Velocity (0—5), and Direction.	Amount (0—10), and Species.	Velocity (0—5), and Direction.	Amount (0—10), and Species.	No.	3 inches.						12 inches.	No.	22 inches.	
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°			°	°	°	°	°	°						°	°	°	
1	30.436	43.0	30.328	43.0			44.0	36.0	42.0	40.8	38.1	35.6	S.W.	1/2	S.W.	1/2	—	10	st	4	ci	2									1			
2	30.198	41.0	30.372	44.0			44.8	35.1	39.2	37.3	34.3	37.5	S.	1	S.W.	1/2	—	10	st	1	st	2									2			
3	30.290	43.4	30.258	46.0			48.3	35.8	39.6	38.1	40.2	38.8	S.W.	1	S.W.	1/2	—	4	ci	—	—	4									3			
4	30.224	45.0	30.250	47.0			53.5	39.0	45.2	42.4	47.8	44.6	W.	1/2	—	—	—	8	ci	10	st	6									4			
5	30.302	45.4	30.314	45.4			49.1	38.0	44.3	43.8	40.6	39.4	—	—	—	—	—	10	st	2	ci	6									5			
6	30.404	45.0	30.528	46.5			50.1	36.7	43.2	41.0	44.5	43.0	—	—	—	—	—	4	ci	10	ci	2									6			
7	30.470	41.4	30.432	45.0			46.1	33.8	37.1	35.8	40.7	39.1	W.	1/2	—	—	—	8	ci	10	st	2									7			
8	30.344	42.4	30.232	44.2			47.8	35.8	39.1	37.0	38.0	26.2	W.	1/2	—	—	—	10	ci	—	—	4									8			
9	30.120	39.0	30.058	46.0			44.8	34.8	36.7	34.8	38.4	36.3	S.W.	1	S.W.	1	—	2	ci	8	ci	2									9			
10	29.796	47.0	29.808	47.0			49.0	38.2	46.8	45.0	45.8	44.6	S.	1/2	S.	1/2	—	10	st	10	st	2									10			
11	29.694	45.6	29.576	46.8			48.2	42.1	45.0	43.8	45.2	43.4	S.	1	S.W.	1	—	10	st	9	ci	2									11			
12	29.632	49.0	29.588	46.5			53.0	40.6	48.0	43.5	43.7	40.2	S.W.	1	S.W.	3	—	10	st	9	st	2									12			
13	29.130	49.0	29.428	47.0			52.2	39.4	51.0	48.4	40.7	40.5	S.W.	2	S.W.	1/2	—	10	st	—	—	4									13			
14	29.604	42.0	29.704	42.4			45.0	34.6	38.4	35.0	39.8	36.7	S.W.	1/2	W.	1/2	—	4	ci	—	—	5									14			
15	29.600	40.8	30.042	41.0			42.0	29.2	37.2	33.0	30.1	28.0	N.W.	1	N.E.	1	—	1	ci	—	—	4									15			
16	29.694	39.0	29.668	45.0			52.8	28.2	37.1	35.2	42.3	37.4	W.	1	N.W.	2	—	1	ci	—	—	4									16			
17	29.790	44.0	29.802	46.0			49.4	37.6	41.9	37.8	44.6	42.8	N.W.	1/2	W.	1/2	—	1	ci	—	—	4									17			
18	29.338	57.0	29.920	45.6			53.0	34.7	49.8	41.3	36.5	34.0	W.	4	W.	3	—	1	ci	—	—	4									18			
19	30.428	45.0	30.540	46.0			48.4	32.2	41.4	39.1	43.3	39.1	N.W.	2	N.W.	1	—	4	ci	3	st	4									19			
20	30.370	46.0	30.338	49.2			53.3	40.1	42.0	39.1	50.5	46.8	S.W.	1/2	S.	1/2	—	10	st	2	ci	2									20			
21	30.490	49.0	30.574	49.0			53.2	46.2	49.0	45.6	47.3	48.2	N.	1	N.	1/2	—	1	st	6	ci	2									21			
22	30.348	48.0	30.152	49.0			54.7	38.6	45.0	41.8	47.0	42.0	—	—	N.	3	—	1	ci	4	ci	2									22			
23	30.116	48.4	30.068	49.4			54.0	43.2	46.6	41.7	44.2	41.1	W.	1	W.	1	—	2	ci	6	ci	2									23			
24	29.922	45.0	29.744	48.5			53.0	37.1	42.9	40.0	43.0	41.3	W.	1	W.	1	—	6	ci	—	—	5									24			
25	29.842	46.0	28.986	49.6			55.0	37.2	46.0	44.2	51.8	49.8	S.W.	1/2	S.W.	1	—	10	st	10	ci	2									25			
26	28.760	50.0	28.974	48.1			56.5	38.8	50.2	49.4	41.8	38.9	S.W.	1	S.W.	2	—	8	ci	10	st	—									26			
27	29.168	43.0	29.482	44.8			43.2	33.6	36.9	35.9	37.8	32.4	N.	1	N.	1	—	10	ci	3	ci	—									27			
28	29.580	41.0	29.366	41.0			43.1	34.0	38.0	32.7	39.0	35.2	E.	1	E.	2	—	10	st	10	ci	—									28			
29																															29			
30																															30			
31																															31			
Sums.	838.090	1224.4	838.452	1290.0			1399.5	1038.6	1199.6	1123.1							0.86	164	127															
Means.	29.938	44.8	29.945	46.8			44.9	36.8	42.8	40.1	42.3	39.7					1.02	1.05																
† Total Corrections for Instru- mental Errors.	+0.006	-0.7	+0.006	-0.7			-0.4	—	-0.2	-0.3	-0.2	-0.3					0.6	0.6																
‡ Corrections for Diurnal Range.																																		
“Cor- rected Means.”	29.944	44.1	29.951	46.1			49.5	36.8	42.6	39.8	42.2	39.5																						
No. of	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				

Dense fog

Fog.

Slight fall of snow

Violent gale from west

Aurora Borealis

## NOTATION USED IN GENERAL REMARKS.

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

## TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction  $\frac{1}{1000}$  for Temp. (Col. 2), = 29.907  
 Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\frac{1}{1000}$  for Temp. (Col. 4), = 29.908  
 Mean at Station, corrected, and at 32°, = 29.901  
 Correction for height, 66 feet above Mean Sea-level, = 0.074  
 Mean, reduced to 32°, and Sea-level, = 29.975  
 Highest Reading, corrected for Index error, on the 6 th, = 30.554  
 Lowest Do. Do., on the 26 th, = 28.766  
 Difference, or Monthly Range, = 1.788

S-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 26 th, = 56.0  
 Lowest in Month, corrected for Index errors, on the 16 th, = 28.2  
 Difference, or Monthly Range, = 27.8  
 "Corrected Mean" of all the Highest, (Col. 5), = 49.6  
 "Corrected Mean" of all the Lowest, (Col. 6), = 36.8  
 Difference, or Mean Daily Range, = 12.8  
 \*\* Calculated Mean Temperature of Month, = 43.2  
 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), = 42.64  
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 40.396  
 # Computed Temperature of Dew-Point, = 36.2  
 # Do. Elastic Force of Vapour, = 2.14  
 # Do. Weight of Vapour in a Cubic Foot of Air, = 2.48  
 # Relative Humidity, (Saturation = 100), = 79  
 RAIN fell on 9 Days; Amount in Inches, = 0.86

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.	2	1	3	9	7	3	3	1.02			
P.M.	3	1	2	9	5	2	5	1.05			
Mean.	2	1	0	3	9	6	2	4	1.04	1.08	

\* 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.  
 † Embosoming corrections for both capillary and Index Errors.  
 ‡ The Diurnal Range for Scotland is as yet unknown.  
 § Practically, though not absolutely a minus correction.  
 || These "Hygrometrical Deductions" are calculated from Glaisher's Hygrometrical Tables, Second Edition only.  
 ¶ While the Diurnal Range is unknown, the Arithmetical Mean of Cols. 5 and 6 will be entered as the "Calculated Mean Temperature."  
 \*\* Observations not taken under the conditions specified in the Directions on the other side, or noted at the Top of each column, must be marked as such by the observer, in each Schedule. See over.

Observations made and Return verified by James Dale Teacher  
Robert Gordon's College

(Signed) James Dale  
 Greatest Daily Range = 28.2 on the 16<sup>th</sup>

M.  
H.P.



INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

One of the chief objects that the Scottish Meteorological Society proposed to itself when the Society was established in 1865, was to secure perfect uniformity in the system of observation pursued at all its Stations. Uniformity in the system of observation is absolutely necessary to justify the publication of Monthly Results from different observations, it being found that differences between the Returns from two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position or shelter of instruments, different hours of observation, or even from the use of differently constructed instruments. It is therefore a duty that those who kindly furnish Reports to the Society will, by the most scrupulous attention to the following Directions, secure for the Monthly Returns, an accuracy and value comparable with the labour and pains involved in making them, and for the Tables published by the Society, an entire freedom from the errors and several Returns, without which the Society's Reports must inevitably fall in delivering one of the main objects of Meteorological Observation.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich or Railway Time only), as specified in the following remarks, or at the top of the nearest hour, in the time of reading the instruments will be observed. In some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 A.M. or 9 P.M. Weather-Glasses and Aneroids, though well-suited to indicate roughly variations of atmospheric pressure, are not to be used for Meteorological Observation that is not supplied with some means of adjustment or compensation which will secure that the height of the mercury in the tube is accurately measured from the fluctuating surface of the mercury in the cistern.

The Barometer in which the error arising from the fluctuating surface of the mercury in the cistern is entirely got rid of is Fox's's Barometer, the arrangement consisting in applying pressure by means of a screw to the bottom of the cistern, which is made of flexible leather, thus raising or depressing the surface till it just meets the ivory point which forms the zero point of the fixed scale.

The Barometer originally constructed by Mr. Adie of London, and usually called the Board of Trade Barometer, has the great convenience of requiring no adjustment as to compensate the inequalities are not true inches but so much shorter as to compensate the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This is an excellent Barometer for ordinary Observers, inasmuch as it entirely eliminates the error of observation likely to arise in not a few cases in setting the instrument to the zero point of the fixed scale when the light is not good. To show the accuracy with which these Barometers are made, it may be stated, that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, with the result that none of the readings differed from those of the Standard more than 0.003 inch.

A modification of Fortin's Barometer is used at a number of the Society's Stations, by which the coincidence of the zero point with the surface of the mercury is indicated by a little ivory float, whose stem passes freely through the lid and ease of the cistern. When the index-line on this little piston-rod is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the vernier.

It is absolutely necessary that the Barometer which is to be used, shall have been compared with a Standard Barometer.

The Barometer should be suspended in as good a light as can be secured, and to facilitate the reading, a piece of white paper may be exposed to radiate the sun's direct rays nor the heat of a fire, and must not be hung against a wall heated by a fire. The object being to secure that the whole instrument, including the brass fittings, the contained mercury, and the attached Thermometer, shall be, when read, at one uniform temperature, it is evident that the best position is that which is least liable to sudden changes of temperature.

In taking an Observation, the Attached Thermometer is first noted: if the temperature is not gently tapped, and the cistern-adjustment carefully made, the eye, by reading and lowering it, must be brought into the line of the vernier, which must be carefully adjusted so as to form a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will facilitate accurate adjustment and reading of the Barometer. A mistake not unfrequently made by these beginning to observe, consisting in setting the edge of the vernier to the level of the clear surface of the mercury which is in direct contact with the glass tube, must be carefully avoided.

The errors most frequently made in reading the Barometer are errors of 1.000 inch, 0.500 inch, and 0.050 inch; that is to say, instead of 29.365 inches, either of the following is sometimes set down—viz., as 30.365 inches, 28.365 inches, or 29.815 inches. Experience having shown that even the very best Observers make these mistakes, particular attention is directed to the matter.

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must first be screwed so as to form a tight plug to the cistern, thus preventing the escape of the mercury. Then screw up the mercury not quite to the top of the tube, but to within a quarter of an inch of it, and take down the instrument; it should then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case if, on inclining the instrument, a sharp tap is produced when the mercury strikes the top of the tube. If a dull tap is heard, there is air in the tube, which must be got rid of.

As Barometers are liable to be deranged by the introduction of air into their tubes, on removal from place to place, or in being roughly handled, it may be useful to Observers to know how the Barometer may be expelled. First close up the cistern by screwing the ivory peg tight, so as to prevent the escape of mercury; then screw up the mercury to about half an inch from the top of the tube; and having slowly inverted the instrument, place the top of it on a yielding substance, such as the book and gently tap on the cistern with the palm of the hand, so as to induce the air to ascend through the column to the cistern, whence it may escape. Since there is the weight of two atmospheres—the pressure of the mercury in the Barometer, and the air outside—pressing on any air that may be inside the tube, it is usually a tedious operation to get it wholly expelled. After repeated trials, however, it is generally accomplished; and the clear metallic sound of the mercury, when gently struck against the top of the glass tube, will show when the whole of the air has been expelled. On hanging up the Barometer, care must be taken to screw down the mercury in the tube before unscrewing the foot of the cistern, for, if this be not attended to, the mercury will flow out, and the instrument be seriously damaged.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

Reading of the scale of every instrument; the rejection of Thermometers, the frameworks of which are so likely to start expense to the Station, as shown in the list of rejected instruments, and the Thermometers of similar construction; and as to the Thermometers, either Negretti and Zamboni's, or Phillips's, whether rejected at the highest temperatures, may be retained, to be used by the Society, Members and Observers, have a right to their instruments purchased by the Society, and to advise with him regarding the purchase of instruments.

Very great care should be bestowed on the Observations of the Wind, the accuracy of which, both as regards Direction and Force, is of more important problems of the science.

A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it facilitates incessantly, the mean direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thickly-planted Stations over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to BAROMETRIC GRADES, and other points connected with storms.

The Council would recommend the Hemispherical Cup Anemometer, a self-registering instrument which shows the amount of Wind that passes it per day; from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometer recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Ballingall, the Society's Observer at Tallaburgh, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobstructed situation for observation, and partly from the defective nature of the instruments used. The Rain-Gauge should not be placed on a slope or terrace, but on a level piece of ground, in an open situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from shrubs, trees, buildings, or other obstructions, at least as many feet from their base as they are in height. The more important directions, towards which it is most desirable to have a free exposure, are in the order of their importance, S.W., N.E., S.E., S., and W.

When a measuring glass is used, care should be taken to hold it quite perpendicular. This Rain Gauge ought to be read daily at 9 A.M., and the reading entered in the Returns of the previous day. If the Gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month.

Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow-storm occurs, it should be noted in the Remarks; and the letter S affixed to the depth of water received in Gauge. No depth of the snow must be measured at some open place where the drift is observed, and exposed to additional to, and as a check upon, the indications of the rain Gauge. For wind, rain, and snow, as indicated in every column, the Observers cannot be too careful to register observations only, and nothing that pretakes of the nature of detection or inference, for the non-observance of Clouds will be found on the other side.

The amount of Cloud ought to be estimated from the greater or less extension of the sky overclouded (i.e., within 20° or 30° of the zenith). The strata of Clouds that appear near the horizon are viewed obliquely; and thus, being liable to judge of their amount, we ought not to take them into account in the Clouds' column, though their appearance and changes may be noted among the Remarks. The amount of Cloud is entered from a scale of 0 to 10; thus, when the sky overclouded is free from Clouds it is entered 0, when half covered by Clouds, 5, wholly covered, 10, and so on.

Observations of the Clouds are made at 9 A.M. and at sunset, illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—Thus, in the column Velocity and Direction, 9, S. W.

will indicate that the upper strata of Clouds travel with extreme velocity from S.W., and those in the lower regions from W., with one-third the speed of the former. Again, in the second Cloud column, an entry of 2, east, will indicate that the higher regions are covered to the amount of 4-tenths with stratus Clouds; and that the sky is further obscured to the extent of 2-tenths by lower Clouds of the cumulo stratus kind.

Remarks on peculiar Clouds, accompanied with drawings, will assist materially in the development of a more exact nomenclature of Clouds, as well as throw light on the electrical, and other of the more obscure phenomena of Meteorology.

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

As the germination and growth of crops and plants generally, depend greatly on the temperature of the soil,—its amount and constancy,—the Council recommend that Observations in this interesting department be made at 9 A.M., by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 8, 12, and 22 inches, and the stems above ground protected from the sun's rays, and fitted with sloping tin collars, to prevent rain water being conveyed to the bulbs by the stems or wooden frames.

A knowledge of the Temperature of the Sea is not only in itself, but in its relations to that of our island, a most important branch of Meteorology. The Council therefore recommend that the Temperature of the Sea, or carefully taken by a property constructed apparatus, from boats, or if this be impracticable, from the ends of piers and rocks round the coast, where it is not influenced by that of river water, and as little influenced as possible by currents sweeping along the coast, and thus acquiring the temperature of the land, other greatly heated by the sun or cooled by nocturnal radiation. At or near the time of high

water, in cases where the observations cannot be taken daily, the observation, to be made on the 15th, 16th, and 25th of each month. When convenient, extra Sea Observations might be taken for other, and greater depths, noting always the Temperature of the Air, and the Hour of Observation. It is also very desirable that observations on the daily Maxima and Minima by Thermometers continuously immersed, be instituted 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 Well, and the nature of the water being noted.

Mention what Test-Papers are used, Schönbien's or Mollat's, etc. The Paper is affixed by a pin to a board in the Ther-

monometer 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:—thus 3<sup>rd</sup> as an Ozon entry in the schedule will indicate that the Ozon paper is tinted 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, thermometrical, and meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observatory. The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions, ought, therefore, to be taken every advantage of, and a list of such as are in general use are given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevalent Diseases, differences in character, colour, velocity, and direction between the Lower and Upper Strata of Clouds, the Colour of the Sky, etc. Remarks ought to be made on the occurrence of Meteors, Auroras Boreales, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail, or Rain, the Hour of Storms of Wind commencing, attaining their maximum, and ending, as well as such notes on Storms as have been hinted at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of 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 uncoupled, or ruled off for the purpose, from the column of Remarks.

Observations in connection with the Periodic Return of the Seasons, possess not only great scientific value, but are of considerable importance in connection with the 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 repairing 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.

EDINBURGH, December 1880.

EDINBURGH.

Secretary of the Meteorological Society of Scotland,

Mr ALEXANDER BUCHAN,

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To

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Mr Alexander Buchan,

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Received at R.O.S. on April 25th

# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at London College, Alder, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.

Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2 1/2 feet.

During the MONTH of March 1882.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. ———				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS.				Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H.Cup Anemometer. No. ———	No. of hours in which it fell.	Amount in inches. No. ———	9 A.M.		P.M.		9 h. A.M.					Temperature of WELL at depth of feet. No. ———	Temperature at 1 fathom and Density.	0—10.			As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Barometer. * No. ———	Attached Thermometer No. ———	Barometer. No. ———	Attached Thermometer No. ———	Max. No. ———	Min. No. ———	Max. in Sun's rays No. ———	Min. on Grass. No. ———	Dry bulb. No. ———	Wet bulb. No. ———	Dry bulb. No. ———	Wet bulb. No. ———	Direction. No. ———	Force No. ———	Direction. No. ———	Force No. ———				Velocity (0—10), and Direction. No. ———	Amount (0—10), and Species. No. ———	Velocity (0—10), and Direction. No. ———	Amount (0—10), and Species. No. ———	Hours.	No. ———	12 inches. No. ———					No. ———	No. ———		No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No. ———	No.



INSTRUCTIONS

FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

One of the chief objects that the Scottish Meteorological Society proposed to itself when the Society was established in 1855, was to secure perfect uniformity in the system of observation pursued at all its Stations. Uniformity in the observations is absolutely necessary to justify the publication of Monthly Results from the Society's observations, it being found that considerable differences between the returns from two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position or shelter of instruments, different hours of day. It is therefore hoped, that those who kindly transmit Reports to the Society, will, by a scrupulous attention to the following Instructions, secure for their Monthly Returns, an accuracy and uniformity commensurate with the labour and pains bestowed in making them. The Tables published by the Society, in the Reports, are so arranged, as to be comprehensible among the general public, and to be of service to the Society's Reports must inevitably fall in achieving one of the main objects of Meteorological Observation.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich or Railway Time only). The hour of observation, as specified in the following remarks, or at the top of the column of the Schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 A.M. or 9 P.M. Weather-Glasses and Aneroids, though well-suited to indicate roughly variations of atmospheric pressure, are not to be used for Meteorological purposes. No Barometer should be used for Meteorological Observation that is not supplied with some means of adjustment or compensation which will secure that the height of the mercury in the tube is accurately measured from the fluctuating surface of the mercury in the cistern.

The Barometer in which the error arising from the fluctuating surface of the mercury in the cistern is entirely got rid of is Fortin's Barometer, the arrangement consisting in applying pressure by means of a screw to the bottom of the cistern, which is made of flexible ivory, thus raising or depressing the surface till it just meets the ivory point which forms the zero point of the fixed scale. The Barometer originally constructed by Mr. Adie of London, and usually called the Board of Trade Barometer, has the great inconvenience of requiring no adjustment of the cistern. Its scale-inches are not true inches, but so much shorter as to compensate the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This is an excellent Barometer for ordinary Observers, inasmuch as it entirely eliminates the error of observation likely to arise in a few cases in setting the instrument to the zero point of the fixed scale when the light is not good. To show the accuracy with which these Barometers are made, it may be stated, that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, with the result that none of the readings differed from those of the Standard more than 0.003 inch.

A modification of Fortin's Barometer is used at a number of the Society's Stations, by which the coincidence of the zero point with the surface of the mercury is indicated by a little ivory float, whose stem, passes freely through the lid and ease of the cistern. When the index-line on this little piston-rod is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the vernier.

It is absolutely necessary that the Barometer which is to be used, shall have been compared with a Standard Barometer.

The Barometer should be suspended in as good a light as can be secured, and to facilitate the reading, a piece of white paper may be put behind the tube. It must be hung truly perpendicular, and exposed to neither the sun's heat rays nor the rays of the moon, and must not be hung against a wall heated by the fire. The object being to secure that the whole instrument, including the brass filices, the contained mercury, and the glass itself, shall be at the same temperature. It is thus evident that it is evident that the best position for the Barometer is that in which it is least liable to sudden changes of temperature. When taking an observation, the Affected Thermometer is first noted, this being done most gently tapped, and the cistern-adjustment carefully made. The eye, by raising and lowering it, must be brought into the plane of the back and front of the index—usually the lower edge of the vernier, which must be carefully adjusted so as to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly, so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will facilitate an accurate adjustment and reading of the Barometer. A mistake not unfrequently made by those beginning to observe, consisting in setting the edge of the vernier to the level of the clear surface of the mercury which is in direct contact with the glass tube, must be carefully avoided.

The errors most frequently made in reading the Barometer are errors of 1.000 inch, 0.500 inch, and 0.050 inch; that is to say, instead of 29.365 inches, either of the following is sometimes set down—viz., as 30.365 inches, 28.365 inches, 29.865 inches, or 29.815 inches. Experience having shown that even the very best Observers make these mistakes, particular attention is directed to the matter. When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must first be screwed so as to form a tight plug to the cistern, thus preventing the escape of the mercury. Then screw up the mercury not quite to the top of the tube, but to within a quarter of an inch of it, and take down the instrument; it should then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case if, on inclining the instrument, a sharp tap is produced when the mercury strikes the top of the tube. If a dull tap is heard, then air is in the tube, which must be got rid of.

As Barometers are liable to be damaged by the introduction of air into their tubes, on removal from place to place, or in being roughly handled, it may be useful to Observers to know how the tube may be expelled. First close up the cistern by screwing the ivory peg tight, so as to prevent the escape of mercury; then screw up the mercury to about half an inch from the top of the tube; and having slowly inverted the instrument, place the top of it on a yielding substance, such as the foot, and gently tap on the cistern with the palm of the hand, so as to induce the air to ascend through the column to the cistern, whence it may escape. Since there is the weight of two atmospheres—the pressure of the mercury in the Barometer, and the air outside—pressing on any air that may be inside the tube, it is usually a tedious operation to get it wholly expelled. After repeated trials, however, it is generally accomplished; and the clear metallic sound of the mercury, when gently struck against the top of the glass tube, will show when the whole of the air has been expelled. On hanging up the Barometer, care must be taken to screw down the mercury in the tube before understanding the float of the cistern; for, if this be not attended to, the mercury will flow out, and the instrument be seriously damaged.

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Lonye-headed Box for the protection of the instruments from dust and moisture. The Hygrometers, secured to four stout posts, also painted white, firmly fixed in the ground. The posts must be of such a length that when the Thermometers are hung 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, and 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, as much of the day as surrounding conditions enable the Observers to secure. The Thermometers are suspended on cross-laths in the centre of the Box, and face the door, which should open to the north. The Council regard the question of EXPOSURE OF HEIGHT ABOVE GROUND, AND METHOD IN PROTECTING THE THERMOMETERS, as vital in every system of Meteorological Observation, since without it Observations made at different Stations are incomparable, thus rendering it 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 Rutherford'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 column of spirit breaking, and part of the spirit distilling by high temperature and lodging at the top of the tube. This derangement is of occasional occurrence with Protected Thermometers, but of frequent occurrence with exposed Thermometers. Hence a systematic 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 still adhering to the sides of the tube to drain down to the column. But 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, till the detached portion of spirit is melted, and the column of spirit. Care must be taken that the heat is not applied too quickly; for, if this be done, the tube will break and the instrument be destroyed. The best way to apply the requisite amount of heat, is by bringing the end of the tube slowly down towards a minute flame from a gas-burner; on it gas be not lit 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 during night, have a black coating, which may easily be made, or needed, by the application of a mixture of lampblack and printer's ink. They are placed in shallow blackened boxes, whose sides protect the bulbs from the sun. The Maximum should rest on wooden supports a few inches from the surface of the grass, in an open situation. Snow must be kept off the top of either of these thermometers; for the heat is to be detected by the thermometer being dissipated. Black-balls, called in glass jacks, may also be used, being indeed preferable to the above. It must never 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 in the same frame. As apparently slight derangements vitiate the Hygrometrical Observations, Observers are specially requested to attend to the following conditions.—The bulbs must hang down by at least an inch free from the scales and frame to which they are attached; the frame must be such as will bring the tubes forward by an inch from any board on which it may be suspended; and the water-cup 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 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 to by the Observer that the muslin is always clean and moist, and the water pure. In frosty weather, observation is a matter of much delicacy, and must be made with great care. The bulb must be moistened 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.

In reading the Thermometer great care must be taken to bring the eye exactly opposite the tip of the index or column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus the Thermometer will be read—39°·9, 40°·0, or 40°·1; or again, 40°·4, 40°·5, 40°·6, according as it indicates a little under, an exact coincidence with, or a little over 40°, or 40½, respectively. So also 40½, and 40¾, more or less must be registered 40°·2, or 40°·3, and 40°·75, or 40°·8 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, and rapidly, read, inasmuch as they are readily affected by heat from the person of the Observer.

The Hygrometer is read at 9 A.M. and 9 P.M. The Self-Registering Thermometers are read at 9 P.M. only, as indicating the greatest and least degrees of temperature in the 24 hours preceding. It is not a matter of 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 day. In the Society's schedules, the indications registered on the 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 as are not graduated on the stem, but merely on the bulb, are attached to the scales, 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 snowy or melting ice.

In selecting instruments, the following points require attention.—The divisions of the vernier of Barometers in reference to their scales, and the perfect freedom of the Barometer from air; the correct num-

bering of the scale of every instrument; the rejection of Thermometers, the frameworks of which are not likely to stand exposure to the weather, as shown in the past by repeated and annoying breakages of Thermometers of similar construction; and as regards Maximum Thermometers, either Negretti's and Zambra's, or Phillips's, whether they will set at the highest of the Society's Members and Observers have to register. By the laws of the Society, Members and Observers have a right to have their instruments compared by the Secretary, and to advise with him regarding the purchase of instruments.

Very great care should be bestowed on the Observations of the Wind, the accuracy of which, both as regards Direction and Force, is so essential towards the right discussion of many of the more important problems of the science.

A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it oscillates incessantly, the mean direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thick-planted Stations over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to BAROMETRIC GRADIENTS, and other points connected with storms.

The Council would recommend the Hemispherical Cup Anemometer, a self-registering instrument which shows the amount of Wind that passes it per day; from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometers recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Ballingall, the Society's Observer at Ellaburgh, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobstructed situation for observation, and partly from the defective nature of the instruments used. The Rain-Gauge should not be placed on a slope or terrace, but on a level piece of ground, in as open a situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from trees, buildings, or other obstructions, at least as many feet from their base as they are in height. The more important directions, towards which it is most desirable to have a free exposure, are in the order of their importance, S.W., N.E., S.E., S., and W. The rain of the Gauge must be perfectly level, and fixed so that it will remain level in all weathers, and be a height of one foot above ground, over grass.

In rain-gauges of this kind, rain ought to be fixed down, and the float rod to its height only the time the instrument is read, it being found that rain falling on the top of the float rod seriously interferes with the proper registering of the Rain.

When a measuring glass is used, care should be taken to hold it quite parallel to the horizon. The Rain Gauge ought to be read daily at the same hour, and the reading entered in the Returns of the previous day. If the gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month.

Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow-shower occurs, it should be noted in the 'Remarks,' and the letter S affixed to the depth of water received in Gauge.

The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the Rain-Gauge. For wind, rain, and snow, as indicated in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Cloud ought to be estimated from the greater or less observation of the sky overhead (i.e., within 20° or 30° of the zenith). The strata of Clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the Clouds' column, though their appearance and changes may be noted among the Remarks. The amount of Cloud is entered from a scale of 0 to 10; thus, when the sky overhead is free from Clouds it is entered 0, when half covered by Clouds, 5, wholly covered, 10, and so on.

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

Remarks on peculiar Clouds, accompanied with drawings, will assist materially in the development of a more exact nomenclature of Clouds, as well as throw light on the electrical and other of the more obscure phenomena of Meteorology. The approximate number of Hours in which objects in the sun's rays cast shadows, should be entered in the proper column.

As the germination and growth of crops and plants generally, depend greatly on the temperature of the soil,—its amount and constancy,—the Council recommend that Observations in this interesting department be made at 9 A.M., by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 3, 12, and 22 inches, and the stems above ground protected from the sun's rays, and fitted with sloping tin collars, to prevent rain water being conveyed to the bulbs by the stems or wooden frames.

A knowledge of the Temperature of the Sea is not only in itself, but in its relations to that of our island, a most important branch of Meteorology. The Council therefore recommend that the Temperature of the Sea be carefully taken by a properly constructed apparatus, from boats, or if this be impracticable, from the tops of piers and rocks round the coast, where it is not disturbed by the action of the waves, and as little influenced possible by currents except along the coast, and thus acquiring the temperature of the land, after greatly heated by the sun or cooled by nocturnal radiation. As or near the time of high

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

The Temperature of the water at the bottom of the sea ought, when practicable, to be taken, both at the surface and at the Well. Well and of the water being noted.

Mention what Test-Papers are used, Schönbein's, etc. The Paper is affixed by a pin to a board in the Thermometer 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:—thus 3<sup>rd</sup>, as an Ozone entry in the schedule will indicate that the Ozone paper is tinted as 3 on the scale, that the wind is from the N.W., and that its force on the scale 0—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, thermometrical, and meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observatory. The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours assigned. The use of contrivances, ought, therefore, to be taken every advantage of, and a list of such as are in general use are given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to prevalent Diseases, differences in character, colour, velocity, and direction between the Lower and Upper Strata of Clouds, the Colour of the Sky, etc. Remarks ought to be made on the occurrence of Meteors, Aurora Borealis, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail, or Rain, the Hour of Storms of Wind commencing, attaining their maximum, and ending, as well as such notes on Storms as have been limited at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of 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, objects being cupied, or ruled off for the purpose, from the column of 'Remarks.'

Observations in connection with the Periodic Return of the Seasons, possess not only great scientific value, but are of considerable importance in connection with Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the Seasons.

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 plants raised in any year, on an isolated piece of ground or farm. The Annual Tables, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more especially directed.

The Council recommend Observers, before purchasing new instruments, and in revising 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)  
EDINBURGH, December 1880.

OBSERVATIONS

IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	First buds.	In Leaf.	Diseased of Leaves.	CROPS.	Sowing or above ground.	Raising or above ground.	In Ear.	First cut.	CROPS.									
										Barley.	Oats.	Wheat.	Beans.	Peas.	Potatoes.	Turnips.	Rye Grass.		
Alder.																			
Beech.																			
Elm.																			
Larch.																			
Oak.																			
Sycamore or Plane.																			

SHRUBS, ETC.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.
Barberry.																				
Bourtree or Elder.																				
Black Currant.																				
Cherry.																				
Gooseberry.																				
Hawthorn.																				
Holly.																				
Laburnum.																				
Leach.																				
Lilac.																				
Mountain Ash or Rowan.																				
Red Flowering Currant.																				
Rhododendron Ponticum.																				
Whin.																				

Leave the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., in perfection; whether any have suffered from blight, disease, etc. Weather, Zephyrus, Eurus, etc., and the Agricultural condition of the district generally.

Mr ALEXANDER BUCHAN,

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK POST.

Aberdeen  
Mar. 1882



## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abde., County of Aberdeen, in Lat. 57° 9' N., Long. 2° 6' W., Distance from Sea 1 mile.  
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2½ feet. During the MONTH of April 1882.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.		SELF-REGISTERING THERMOMETERS. THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.		THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.  As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.  Mention the hour at which Storms, 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. * No.	Attach- ed Ther- mometer	Barometer. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Dirac- tion.	Force	Dirac- tion.	Force	No. of hours in which it fell.	Amount in inches.	Velocity (0-10), and Direction.	Amount (0-10), and Direction.	Amount (0-10), and Direction.					No. 3 inches.	12 inches.	No. 22 inches.
		Inches.	°	Inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°	°	°
	1	29.912	45.0	30.084	46.1	46.8	39.0			44.0	42.1	44.1	43.0	S.E.	1/2	—	—	—	st	10	st	10	—	—	—			1	
	2	30.180	45.0	30.192	43.8	50.6	40.8			44.6	42.3	42.9	40.5	—	—	S.W.	1/2	—	st	10	cu-st	10	2	—	—			2	
	3	30.236	44.0	30.174	45.2	45.0	39.6			42.9	38.7	44.0	42.9	S.E.	1	E.	1	—	st	10	st	10	1	—	—			3	
	4	30.280	46.7	30.342	45.4	51.1	40.0			46.3	44.2	41.8	38.6	S.E.	1	S.E.	2	—	cu-st	10	ci	4	10	—	—			4	
	5	30.350	46.0	30.370	45.9	48.2	39.2			46.0	40.8	42.8	40.6	S.E.	1/2	—	—	—	st	10	st	10	1	—	—			5	
	6	30.448	45.6	30.494	45.8	48.0	40.4			45.8	43.2	42.9	40.4	S.E.	1/2	—	—	—	—	—	cu-st	4	3	—	—			6	
	7	30.546	47.0	30.562	46.0	53.0	36.4			44.5	41.3	41.0	39.8	—	—	—	—	—	cu	2	—	—	9	—	—			7	
	8	30.530	43.0	30.464	45.7	53.0	26.9			39.7	36.8	41.5	39.2	—	—	—	—	—	st	8	st	9	10	—	—			8	
	9	30.350	46.5	30.208	42.2	46.8	35.2			40.3	38.2	38.2	37.0	—	—	S.E.	1	—	st	10	ci	4	10	—	—			9	
	10	30.100	42.0	30.022	45.3	43.0	30.0			39.0	37.6	42.6	39.1	N.	1	N.	1/2	—	st	10	st	10	—	—	—			10	
	11	29.910	44.0	29.872	44.2	43.1	30.0			43.6	41.0	46.0	38.0	N.W.	1	N.W.	1/2	—	st	10	st	10	—	—	—			11	
	12	29.832	43.0	29.790	42.2	47.0	37.3			42.9	39.2	40.7	38.2	S.E.	1	S.E.	1/2	—	st	10	st	10	—	—	—			12	
	13	29.620	41.0	29.356	43.0	42.3	37.0			40.1	36.4	39.1	35.6	E.	2	E.	3	—	st	10	st	10	—	—	—			13	
	14	29.228	44.0	29.350	44.0	41.9	34.7			40.0	38.4	38.3	35.2	E.	2	E.	2	—	st	10	st	10	—	—	—			14	
	15	29.482	42.1	29.628	41.9	42.2	31.6			39.9	35.0	33.0	30.0	N.	1	N.	1/2	—	cu-st	7	—	—	8	—	—			15	
	16	29.534	41.0	29.508	40.1	37.0	34.2			36.0	33.0	29.8	29.6	N.W.	1/2	N.	1	—	st	9	st	10	—	—	—			16	
	17	29.292	42.8	29.220	43.5	45.5	29.5			41.8	40.5	40.3	38.6	S.E.	1/2	N.W.	1	—	st	10	st	10	—	—	—			17	
	18	29.610	43.0	29.828	44.0	50.0	35.9			42.0	38.1	37.2	34.1	N.	1	—	—	—	cu	3	st	1	12	—	—			18	
	19	29.598	44.0	29.526	43.1	36.2	36.0			42.9	41.8	51.9	49.3	S.	2	S.W.	1	—	Nim	10	ci-st	6	4	—	—			19	
	20	29.638	50.0	29.896	3.0	62.4	38.2			52.0	46.6	53.0	49.1	N.	1/2	N.	1	—	—	4	cu-st	8	8	—	—			20	
	21	29.916	52.0	29.920	32.6	55.0	39.0			52.2	48.7	49.0	46.7	S.W.	1	—	—	—	cu-st	5	st	2	10	—	—			21	
	22	29.726	49.6	29.400	49.0	52.0	40.4			49.5	46.8	46.2	45.2	S.W.	1	S.	1	—	cu-st	8	Nim	10	—	—	—			22	
	23	29.268	59.0	29.116	49.2	54.8	40.9			52.0	48.0	46.2	45.6	S.	1/2	E.	1/2	—	cu-st	10	Nim	10	—	—	—			23	
	24	29.110	44.2	29.134	49.5	53.2	46.1			47.0	43.1	44.9	43.9	N.W.	1	N.W.	1	—	cu-st	10	cu-st	10	—	—	—			24	
	25	29.164	48.0	29.176	48.0	52.8	39.9			47.0	43.1	44.2	41.5	N.W.	2	N.W.	2	—	cu	4	st	9	4	—	—			25	
	26	29.370	45.0	29.520	46.0	45.3	39.0			42.8	38.7	38.8	38.0	N.	2	N.W.	2	—	cu-st	10	Nim	10	4	—	—			26	
	27	29.626	48.0	29.422	47.0	48.2	36.1			44.0	39.1	43.1	40.8	S.W.	1	S.W.	2	—	ci	1	cu-st	10	1	—	—			27	
	28	29.204	48.0	29.244	46.0	48.7	39.8			46.0	44.2	45.6	43.9	S.	2	S.	1/2	—	st	10	Nim	10	—	—	—			28	
	29	29.212	46.0	29.208	46.2	51.1	39.2			42.7	38.6	43.0	40.0	N.W.	1/2	E.	1	—	cu-st	10	cu-st	6	2	—	—			29	
	30	29.322	46.8	29.452	47.5	54.1	38.6			45.5	39.9	44.0	38.1	N.W.	1/2	N.W.	1/2	—	cu-st	8	—	—	10	—	—			30	
	31																												31
Sums.		13121	1944	13140	1953	1938	1710			13244	12184	12726	12053						10	3.14									
Means.		29.754	45.9	29.753	45.9	44.1	36.7			44.1	40.9	42.3	40.2						0.95	0.93									
Total Corrections for Instrumental Errors.		+0.006	— .7	+0.006	— .7	— .4	— 0.0			— .2	— .3	— .2	— .3																
Corrections for Diurnal Range.																													
Corrected Means.		29.760	45.2	29.759	45.2	43.9	36.7			43.9	40.6	42.1	39.9																
No. of Column		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

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.	sgs.	" squalls.		
l.	" lightning.	t.	" thunder.		
li. cl.	" light clouds.	t. s.	" thunder storm.		
li. sh.	" light showers.	w.	" wind.		
li. so.	" 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<sup>††</sup> for Temp. (Col. 2), = 29.716  
Corrected Mean" of Barometer at 9 P.M., minus the Correction<sup>††</sup> for Temp. (Col. 4), = 29.715  
Mean at Station, corrected, and at 32°, = 29.715  
Correction for height, 66 feet above Mean Sea-level, = 0.073  
Mean, reduced to 32°, and Sea-level, = 29.788  
Highest Reading, corrected for Index error, on the 7 th, = 30.568  
Lowest Do. Do., on the 24 th, = 29.116  
Difference, or Monthly Range, = 1.452

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 20 th, = 61.6  
Lowest in Month, corrected for Index errors, on the 16 th, = 24.6  
Difference, or Monthly Range, = 37.0  
"Corrected Mean" of all the Highest, (Col. 5), = 48.7  
"Corrected Mean" of all the Lowest, (Col. 6), = 36.7  
Difference, or Mean Daily Range, = 12.0  
\*\* Calculated Mean Temperature of Month, = 42.7  
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =  
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =  
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =  
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, =  
Difference of above Means or Range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 43.05  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 40.2  
# Computed Temperature of Dew-Point, = 36.8  
# Do. Elastic Force of Vapour, = .219  
# Do. Weight of Vapour in a Cubic Foot of Air, =  
# Relative Humidity, (Saturation = 100), = 79  
RAIN fell on 20 Days; Amount in Inches, = 3.14

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

Observations made and Return verified by James Dale - Teacher  
Robert Gordon's College

(Signed) James Dale

376  
46  
556



# INSTRUCTIONS

## FOR TAKING METEOROLOGICAL OBSERVATIONS,

### WITH REMARKS ON THE USE OF INSTRUMENTS.

ONE of the chief objects that the SCOTTISH METEOROLOGICAL SOCIETY proposed to itself when the Society was established in 1855, was to secure greater uniformity in the system of observation pursued at all the Stations. Uniformity in the observations is absolutely necessary to justify the publication of Monthly Results from different observations, it being found that differences between the Returns from two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position or shelter of the instruments, different hours of observation, or even from the use of differently constructed instruments. It is therefore hoped, that those who kindly furnish Reports to the Society will, by a scrupulous attention to the following Directions, secure for their Monthly Returns, an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, an entire comparableness among the several Returns, without which the Society's Reports must inevitably fail in achieving one of the main objects of Meteorological Observation.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich or Railway Time only), as specified in the following remarks, or at the top of the column of the Schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 A.M. or 9 P.M.

**Weather-Glasses and Aneroids.** Though well-suited to indicate roughly variations of atmospheric pressure, are not fitted for scientific purposes. No Barometer should be used for Meteorological Observation that is not supplied with some means of adjustment or compensation which will secure that the height of the mercury in the tube is accurately measured from the fluctuating surface of the mercury in the cistern.

The Barometer in which the error arising from the fluctuating surface of the mercury in the cistern is entirely got rid of is PORTER'S Barometer, the arrangement consisting in applying pressure to the tube of a screw to the bottom of the cistern, which is made of flexible leather, thus raising or depressing the surface till it just meets the ivory point which forms the zero point of the scale.

The Barometer originally constructed by Mr. ADIE of London, and usually called the Board of Trade Barometer, has the great convenience of requiring no adjustment of the cistern. Its scale-errors are not too trifling, but so much shorter as to compensate the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. It is an excellent Barometer for ordinary Observers, inasmuch as it entirely dominates the error of observation likely to arise in any other case in setting the instrument to the zero point of the fixed scale when the light is not good. To show the accuracy with which these Barometers are made, it may be said, that when compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, the result that none of the readings differed from those of the Standard more than 0.003 inch.

A modification of PORTER'S Barometer is used at a number of the Society's Stations, by which the coincidence of the zero point with the surface of the mercury is indicated by a little ivory float, whose passes freely through the lid and case of the cistern. When indelible on this little piston-rod is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the face of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the vernier.

It is absolutely necessary that the Barometer which is to be used, shall have been compared with a Standard Barometer. The Barometer should be suspended in as good a light as can be secured, and to facilitate the reading, a piece of white paper may be put behind the tube. It must be hung truly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire, and must not be hung against a wall heated by a fire. The object being to secure that the whole instrument, including the brass fittings, the contained mercury, and the attached Thermometer, shall be, when read, at one uniform temperature; it is evident that the best position is that which is least liable to sudden changes of temperature.

In taking an Observation, the Attached Thermometer is first noted: the tube must then be gently tapped, and the cistern-adjustment carefully made. The eye, by raising and lowering it, must be brought into the plane of the back and front of the index—usually the lower edge of the vernier, which must be carefully adjusted so as to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly, so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will facilitate an accurate adjustment and reading of the Barometer. A mistake not unfrequently made by those beginning to observe, consisting in setting the edge of the vernier to the level of the clear surface of the mercury which is in direct contact with the glass tube, must be carefully avoided.

The errors most frequently made in reading the Barometer are errors of 1.000 inch, 0.500 inch, and 0.050 inch; that is to say, instead of 29.365 inches, either of the following is sometimes set down—viz., as 30.365 inches, 28.365 inches, 29.865 inches or 29.815 inches. Experience having shown that even the very best Observers make these mistakes, particular attention is directed to the matter. When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must first be screwed so as to form a tight plug to the cistern, thus preventing the escape of the mercury. Then screw up the ivory peg quite to the top of the tube, but to within a quarter of an inch of the cistern. Before disengaging the Barometer from its fastenings, it must be ascertained whether the mercury in the tube is at a complete vacuum; this is the case if, on inverting the instrument, a sharp tap is produced when the mercury strikes the top of the tube. If a dull tap is heard, there is air in the tube, which must be got rid of.

The Barometers are liable to be deranged by the introduction of air into their tubes, on removal from place to place, or in being roughly handled. It may be useful to Observers to know how the air may be expelled. First close the cistern by screwing the ivory peg tight, so as to prevent the escape of mercury; then screw up the ivory peg to about half an inch from the top of the tube; and, having slowly inverted the instrument, place the top of the tube on a yielding substance, such as the foot, and gently tap on the cistern with the palm of the hand, so as to induce the air to ascend through the column to the cistern, whence it may escape. Since there is the weight of two atmospheres—the pressure of the mercury in the Barometer, and the air outside—pressing on any air that may be inside the tube, it is usually a tedious operation to get it wholly expelled. After repeated trials, however, it is generally accomplished; and the clear metallic sound of the mercury, when gently struck against the top of the glass tube, will show when the whole of the air has been expelled. On hanging up the Barometer, care must be taken to screw down the mercury in the tube before unfastening the float of the cistern, for, if this be not done, the mercury will flow out, and the instrument be seriously damaged.

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Lorry-boarded Box for the Thermometers, painted white inside and outside, and with the Hygrometers, either Eight Temperatures or Phillips's, whether they will act at the height of the cistern, they may be required to register. By the laws of the Society, Members and Observers have a right to have their instruments compared with those of the Secretary, and to advise with him regarding the proper use of instruments.

Very great care should be bestowed on the Observations of the Wind. Wind, the accuracy of which, both as regards Direction and Force, is so essential towards the right disposition of many of the more important problems of the science, is a Wind-Vane ought to be elevated at least 12 feet above any roof or other obstruction. When it oscillates incessantly, the wind direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thickly-planted Stations over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to BAROMETRIC GRADE, and other points connected with storms.

The Council would recommend the Hairspring Cup Anemometer, a self-registering instrument which shows the meter, a meter of Wind that passes it per day; from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometer recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Ballingall, the Society's Observer at Edinburgh, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobstructed situation for observation, and partly from the defective nature of the instruments used. The Rain-Gauge should not be placed on a slope or terrace, but on a level piece of ground, in an open situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from shrubs, trees, buildings, or other obstructions, at least as many feet from them as they are in height. The more important directions, towards which it is most desirable to have a free exposure, are in the order of their importance, S.W., N.E., S.E., S., and W. The rim of the Gauge must be perfectly level, and fixed so that it will remain level in all weathers, and be at a height of one foot above ground, over grass. In such gauges as Plumings, which are furnished with a measuring rod attached to a float, the rod ought to be fixed down, and the float rise to its height only at the time the instrument is read, it being found that a stem projecting above the rim of the gauge seriously interferes with the proper measurement of the Rain-fall. When a measuring glass is used, care should be taken to hold it quite perpendicular. The Rain Gauge ought to be read daily at 9 A.M. and the reading entered in the Returns of the previous day.

If the Gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month. Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow-shower occurs, it should be noted in the Remarks, and the letter S affixed to the depth of water received in Gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the Rain-Gauge. For wind, rain, and snow, as indeed in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Clouds ought to be noted on the right side. The amount of Clouds of Clouds that appear, within 90° or 30° of the zenith. 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## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Aberdeen, County of Aberdeen, in Lat. 57°9'N, Long. 2°6'W, Distance from Sea 1 mile.Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 22 feet.During the MONTH of May 1882.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. _____				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.  As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.  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.		Readings of the H. Cup Anemometer. No. _____	No. of hours in which it fell.	9 A.M.		P.M.		9 h. A.M.							
		Barometer. * No. _____	Attach- ed Ther- mometer No. _____	Barometer. No. _____	Attach- ed Ther- mometer No. _____	Max. No. _____	Min. No. _____	Max. in Sun's rays No. _____	Min. on Grass. No. _____	Dry bulb. No. _____	Wet bulb. No. _____	Dry bulb. No. _____	Wet bulb. No. _____	Direc- tion.	Force	Direc- tion.	Force			Velocity (0-10), and Direc- tion.	Amount (0-10), and Species.	Velocity (0-10), and Direc- tion.	Amount (0-10), and Species.	No. 3 inches.	No. 12 inches.	No. 22 inches.					
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°
1	29.496	48.0	29.430	47.6	52.0	35.9			46.8	43.0	46.6	44.1	W.	1	S.W.	1			.12	cu	3	cu-lt	6	8						1	
2	29.596	48.0	29.704	50.0	51.4	42.6			48.2	45.3	47.2	43.2	S.W.	1 1/2	W.	1			.04	cu-lt	10	ci	1	6						2	
3	29.880	50.0	29.739	49.5	55.1	36.5			49.0	44.0	46.9	45.7	—	—	—	—			.30	ci	1	sc	10	7						3	
4	29.608	50.5	29.716	50.0	53.0	45.2			51.0	48.1	47.0	43.1	N.W.	1	N.W.	1			—	cu-lt	9	st	10	6						4	
5	29.792	50.0	29.830	48.2	53.0	35.0			49.2	43.2	46.2	43.1	N.	1/2	S.W.	1/2			—	ci	1	ci	4	13						5	
6	29.818	48.0	29.862	46.0	48.0	40.1			46.8	44.0	43.4	41.8	S.	1	—	—			.05	cu-lt	10	st	10	—						6	
7	29.996	47.6	30.086	48.0	48.6	38.1			46.8	43.2	44.6	41.8	S.E.	1/2	E.	1			.06	ci-lt	10	cu-lt	10	—						7	
8	30.170	47.0	30.248	46.4	44.2	36.0			46.0	40.8	43.1	39.8	E.	1/2	E.	1/2			—	cu-lt	10	ci	5	4						8	
9	30.160	48.0	30.048	50.0	53.4	37.2			44.1	41.8	50.2	47.2	S.W.	1 1/2	—	—			.09	st	10	cu-lt	10	6						9	
10	30.218	53.2	30.162	52.8	61.7	38.2			52.9	45.8	51.7	47.0	W.	1/2	—	—			.01	cu	4	ci-lt	2	12						10	
11	30.094	53.0	29.722	50.0	56.1	43.8			53.4	47.7	49.9	47.4	W.	1/2	W.	1 1/2			.42	st	10	Nim	10	4						11	
12	30.006	50.0	30.214	52.0	58.0	39.8			50.8	44.9	49.0	44.5	N.W.	2	N.W.	1/2			.01	ci-cu	1	st	1	8						12	
13	30.338	50.6	30.404	50.0	57.2	42.5			50.8	46.2	47.8	44.2	N.	2	—	—			—	st	10	st	10	6						13	
14	30.426	50.0	30.420	49.5	52.0	38.8			48.0	42.1	45.0	40.2	N.E.	1	N.E.	1			—	cu	8	cu-lt	8	10						14	
15	30.398	48.0	30.412	48.8	51.1	41.0			46.0	40.0	42.5	39.2	N.E.	1	N.E.	1/2			—	cu-lt	9	cu-lt	2	10						15	
16	30.452	50.0	30.444	47.8	54.2	39.8			49.0	43.6	45.0	42.2	N.E.	1	E.	1			—	ci	1	—	—	15						16	
17	30.434	52.0	30.410	50.2	62.0	36.1			55.0	50.3	47.3	44.0	—	—	S.	1/2			—	—	—	—	—	16						17	
18	30.404	56.0	30.336	51.8	61.9	39.4			57.0	51.6	49.8	45.0	S.	1/2	—	—			—	—	—	—	—	15						18	
19	30.292	47.0	30.258	51.0	53.0	42.2			46.3	44.4	46.8	45.2	S.	1/2	—	—			—	cu-lt	8	ci	1	12						19	
20	30.210	47.5	30.112	47.0	52.0	38.8			46.5	44.7	42.0	41.0	S.	1/2	—	—			—	st	10	ci	1	10						20	
21	30.076	51.7	30.092	50.0	56.9	38.9			51.0	48.3	49.0	47.5	S.E.	1/2	—	—			—	st	10	st	10	5						21	
22	30.046	52.0	29.828	50.0	58.8	40.8			52.0	49.1	47.2	45.8	S.E.	1	S.E.	1/2			—	cu	3	ci-cu	5	14						22	
23	29.676	48.0	29.472	49.0	54.2	40.3			47.0	44.8	48.0	46.2	S.E.	1	S.	1/2			.02	ci-cu	5	ci-lt	6	14						23	
24	29.216	50.0	29.120	50.5	55.2	42.7			48.9	48.0	50.2	43.1	—	—	S.	1			.08	st	10	cu-lt	8	6						24	
25	29.360	57.0	29.464	52.0	60.8	48.3			57.0	50.1	50.0	46.2	S.W.	1/2	S.W.	1			.25	ci-lt	3	cu-lt	10	10						25	
26	29.470	55.0	29.660	53.0	66.0	48.7			56.4	53.8	52.1	51.0	N.W.	1	S.W.	1			.01	ci-cu	8	cu-lt	10	10						26	
27	29.682	57.0	29.738	56.0	63.4	49.6			56.1	52.4	54.6	49.2	S.	1 1/2	W.	1			—	cu	5	ci	2	12						27	
28	29.838	57.0	30.008	58.0	64.6	47.9			55.4	51.4	57.0	49.3	S.W.	2	—	—			.12	ci-cu	4	ci	1	14						28	
29	30.148	61.0	30.238	59.0	69.4	48.6			60.2	50.4	52.2	45.4	W.	1	—	—			—	—	—	ci	2	10						29	
30	30.308	57.0	30.340	57.0	61.0	46.0			57.2	48.3	53.4	48.2	S.	1/2	S.	1/2			—	cu	8	ci-lt	10	10						30	
31	30.368	57.0	30.386	54.0	61.2	48.7			55.2	50.6	52.4	48.0	S.E.	1	—	—			—	ci-cu	6	ci-cu	8	8						31	
Sums.	1216.14	14.3	1214.12	13.6	13.8	18.14			16.9	12.11	16.4	16.8		7		5			14	1.58		187	173	287							
Means.	29.999	51.6	29.997	50.9	56.7	41.5			50.9	46.5	48.5	44.9		0.87		0.47				6.0		5.6									
† Total Corrections for Instru- mental Errors.	Sum of last month +0.006	-1.8	+0.006	-1.8	-1.5	-1.1			-1.2	-1.3	-1.2	-1.3																			
† Corre- ctions for Diurnal Range.																															
"Cor- rected Means."	30.005	50.8	30.003	50.1	56.2	41.4			50.7	46.2	48.3	44.6																			
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† = 29.945  
for Temp. (Col. 2), = 30.005..... = 30.005

Corrected Mean" of Barometer at 9 P.M., minus the Correction†† = 29.945  
for Temp. (Col. 4), = 30.005..... = 30.005

Mean at Station, corrected, and at 32°,..... = 29.945

Correction for height, 66 feet above Mean Sea-level,..... = 0.072

Mean, reduced to 32°, and Sea-level,..... = 30.017

Highest Reading, corrected for Index error, on the 16 th,..... = 30.458

Lowest Do. Do., on the 24 th,..... = 29.126

Difference, or Monthly Range,..... = 1.332

\* 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 capillarity and Index Errors.

†† The Diurnal Range for Scotland is as yet unknown.

‡ These "Hygrometrical Deductions" are calculated from Glaisher's Hygrometrical Tables, Second Edition only.

§ While the Diurnal Range is unknown, the Arithmetical Mean of Cols. 5 and 6 will be entered as the "Calculated Mean Temperature."

Any Observations not taken under the conditions specified in the Directions on the other side, or noted at the Top of each column, must be marked as such by the observer, in each Schedule. See over.

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 24 th,..... = 68.6

Lowest in Month, corrected for Index errors, on the 5 th,..... = 35.0

Difference, or Monthly Range,..... = 33.6

"Corrected Mean" of all the Highest, (Col. 5),..... = 56.2

"Corrected Mean" of all the Lowest, (Col. 6),..... = 41.4

Difference, or Mean Daily Range,..... = 14.8

\*\* Calculated Mean Temperature of Month,..... = 48.8

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"),..... =

g.D. Range on the 17th 25.5

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11),..... = 49.5

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12),..... = 45.4

† Computed Temperature of Dew-Point,..... = 41.0

† Do. Elastic Force of Vapour,..... = 2.58

† Do. Weight of Vapour in a Cubic Foot of Air, ... = 2.93

† Relative Humidity, (Saturation = 100),..... = 73

RAIN fell on 14 Days; Amount in Inches,..... = 1.58

WIND.												SUMMARY.		
Direction.	N	NE	E	SE	S	SW	W	NW	Caln or Variable.	Mean Force.	Mean Velocity in miles per day.			
A.M.	2	3	1	5	6	4	4	3	3	0.87				
P.M.	0	2	3	1	4	4	3	2	12	0.47				
Mean.	1	3	2	3	5	4	3	3	7	0.67	= 0.45 lbs			

Observations made and Return verified by James Dale - Teacher  
Robert Gordon's College

(Signed) James Dale

H.R.







## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.  
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2 1/2 feet. During the MONTH of June 1882.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.  As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.  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.		No. of hours in which it fell.	Amount in inches.	9 A.M.		P.M.		9 h. A.M.								Temperature of WELL at depth of feet. No.	Temperature at 1 fathom, and Depth.	9 A.M.	3 P.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.			No. of the H. Cup 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.	Hours.										No.	3 inches.	12 inches.	No. 22 inches.
inches.	°	inches.	°	°	°	°	°	°	°	°	°	°																											
1	30.380	56.0	30.324	54.0	60.6	41.4			57.0	52.0	51.4	49.0	S.	1	S.	1/2			—	—	—	—	—	16							1								
2	30.274	57.0	30.184	53.5	59.8	47.3			55.9	51.0	52.0	49.0	S.	1	S.	1			—	—	—	ci-cl	9	12							2								
3	30.002	57.0	29.752	57.0	59.0	50.0			57.3	53.9	53.4	51.0	S.	1/2	S.E.	1/2			.56	cu-cl	9	lt	10	4							3								
4	29.222	57.0	29.424	58.0	66.0	50.2			57.1	54.2	54.0	52.0	S.W.	1 1/2	—	—			.02	Nim	6	cu-cl	8	10							4								
5	29.404	58.0	29.390	57.4	62.2	50.0			57.4	51.8	54.1	50.4	S.	1 1/2	—	—			.04	cu	4	ci-cl	4	16							5								
6	29.374	58.0	29.394	58.2	64.6	52.3			56.2	54.3	54.2	51.1	S.W.	1	S.	1/2			.05	cl	10	ci-cl	9	12							6								
7	29.144	58.0	29.592	57.4	61.9	49.3			58.0	54.0	53.0	51.1	S.W.	1/2	—	—			.27	cu-cl	8	cu-cl	10	8							7								
8	29.598	58.0	29.432	57.4	59.6	48.3			57.5	51.6	52.0	50.2	N.W.	1	—	—			.11	cu	6	ci-cl	8	10							8								
9	29.370	54.0	29.524	56.2	54.6	49.4			52.2	51.2	53.2	52.0	E.	1	N.E.	1			.10	cl	10	Nim	10	—							9								
10	29.704	55.6	29.842	53.0	53.0	47.6			53.0	47.2	48.8	44.6	N.	3	N.E.	2			.04	cu-cl	9	cu-cl	4	10							10								
11	29.848	52.0	29.704	54.0	56.8	41.3			51.3	45.0	44.0	42.0	N.W.	2	—	—			.55	cu	2	cl	10	6							11								
12	29.610	51.0	29.686	51.0	47.2	39.0			45.0	43.0	45.0	42.6	N.W.	2	N.W.	2			.16	Nim	10	cu-cl	9	2							12								
13	29.690	51.0	29.624	53.0	58.0	40.0			48.2	44.0	44.0	44.3	N.W.	2	—	—			.07	ci-cl	4	ci-cl	5	14							13								
14	29.370	51.0	29.212	55.0	62.2	39.0			49.0	48.2	50.6	48.2	S.W.	1	N.W.	1			.18	cl	10	cl	10	6							14								
15	29.360	56.0	30.008	52.0	54.0	44.8			50.0	45.0	46.0	42.0	N.W.	2	N.	1			—	cu-cl	6	—	—	12							15								
16	30.106	52.0	29.114	52.5	57.8	41.9			51.0	45.4	47.1	45.1	N.W.	1 1/2	—	—			—	cu-cl	8	ci-cl	5	12							16								
17	29.924	55.0	29.710	54.0	56.0	43.0			54.8	49.0	50.0	49.0	S.W.	1	S.W.	1			.17	ci-cl	10	cl	10	4							17								
18	29.540	53.0	29.368	53.8	53.0	47.9			50.0	49.3	51.4	50.2	S.	1/2	S.E.	1/2			.05	cl	10	cl	10	—							18								
19	29.712	54.0	29.776	54.6	58.9	49.0			52.9	50.9	52.6	50.8	E.	1/2	—	—			—	cl	10	ci-cl	6	8							19								
20	29.748	54.0	29.710	53.8	62.5	46.0			58.6	53.0	52.2	51.0	E.	1/2	S.	1/2			.02	cu	4	ci-cl	10	10							20								
21	29.568	54.0	29.734	56.5	61.5	51.0			54.0	52.0	55.5	52.2	S.	2	—	—			.01	Nim	10	ci-cl	4	8							21								
22	29.788	55.6	29.716	54.6	60.0	48.0			56.4	54.2	53.0	52.0	S.E.	1/2	S.E.	1/2			.95	ci-cl	8	cl	10	—							22								
23	29.680	54.0	29.870	56.0	61.0	50.8			52.8	52.2	52.8	50.9	S.E.	1/2	S.	1/2			.11	Nim	10	ci	5	8							23								
24	29.984	57.0	30.048	56.0	62.2	49.8			57.8	54.0	52.8	51.4	S.	1	S.	1/2			.11	ci	1	cl	16	8							24								
25	29.930	56.0	29.998	56.0	60.0	50.0			58.2	53.3	54.3	53.1	E.	1/2	—	—			—	ci-cl	8	ci	1	6							25								
26	29.998	56.0	30.050	56.8	66.9	46.0			63.6	58.0	57.0	44.0	—	—	—	—			.05	ci	1	cl	10	12							26								
27	30.076	57.0	30.108	57.4	63.0	48.0			57.0	53.0	55.0	53.3	S.	1	N.E.	1			—	cl	10	ci-cl	6	10							27								
28	30.110	58.0	30.118	52.8	63.6	52.0			60.0	57.0	52.8	52.0	N.E.	1	—	—			—	cu-cl	4	cl	10	8							28								
29	30.130	57.0	30.160	58.4	67.3	50.8			62.2	57.3	53.0	52.7	N.E.	1 1/2	N.	1			—	ci	1	cu-cl	2	15							29								
30	30.162	57.5	30.762	58.5	66.3	51.2			60.0	53.8	54.0	51.7	N.E.	1/2	—	—			—	—	—	—	—	16							30								
31																																31							
Sums.		1515 10	16	1313 11	168	1410	138			148	136	117	96					6		362		189	205	263															
Means.		29.770	55.4	29.764	55.4	60.7	47.7			55.1	51.4	51.7	49.5	1.12	0.50					6.3		6.8																	
† Total Corrections for Instrumental Errors.		+0.006	-0.8	+0.006	-0.8	-0.6	-0.2			-0.2	-0.4	-0.2	-0.4																										
‡ Corrections for Diurnal Range.																																							
“Corrected Means.”		29.776	54.6	29.770	54.6	59.4	47.0			54.9	51.0	51.5	49.1																										
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.
cl.	cirrus.	ms.	meteors.
ci-cu.	cirro-cumulus.	n.	nebulae.
ci-s.	cirro-stratus.	r.	rain.
cu.	cumulus.	h. r.	heavy rain.
cu-s.	cumulo-stratus.	c. h. r.	continued heavy rain.
ci-s.	dear.	s.	stratus.
f.	fog.	sc.	scud.
fr.	frost.	s.	sleet.
h-fr.	hoar-frost.	sq.	squall.
h.	haze.	so. h.	solar halo.
h. d.	heavy dew.	sq.	squall.
h. l.	hail.	sq.	squall.
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. la.	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†† = 29.706  
for Temp. (Col. 2), = 29.776 - 0.070 = 29.706  
Corrected Mean” of Barometer at 9 P.M., minus the Correction†† = 29.702  
for Temp. (Col. 4), = 29.804 - 0.102 = 29.702  
Mean at Station, corrected, and at 32°, = 29.720  
Correction for height, 66 feet above Mean Sea-level, = 0.074  
Mean, reduced to 32°, and Sea-level, = 29.794  
Highest Reading, corrected for Index error, on the 14th, = 30.386  
Lowest Do. Do., on the 14th, = 29.218  
Difference, or Monthly Range, = 1.168

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 29th, = 66.7  
Lowest in Month, corrected for Index errors, on the 14th, = 38.9  
Difference, or Monthly Range, = 27.8  
“Corrected Mean” of all the Highest, (Col. 5), = 59.4  
“Corrected Mean” of all the Lowest, (Col. 6), = 47.0  
Difference, or Mean Daily Range, = 12.4  
\*\* Calculated Mean Temperature of Month, = 53.2

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

G.D. Range on the 14th = 22.8

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 53.2  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 50.0  
# Computed Temperature of Dew-Point, = 46.8  
# Do. Elastic Force of Vapour, = 320  
# Do. Weight of Vapour in a Cubic Foot of Air, = 3.58  
# Relative Humidity, (Saturation = 100), = 79  
RAIN fell on 20 Days; Amount in Inches, = 3.62

WIND.		SUMMARY.					
Direction.	N	NE	E	SE	S	SW	W
A.M.	1	3	4	2	8	5	0
P.M.	2	3	0	3	6	1	0
Mean.	2	3	2	2	7	3	0

Observations made and Return verified by { James Dale Teacher in Rob. Gordon's College

(Signed) James Dale

6661 77







# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Aberdeen County of Aberdeen, in Lat. 57°9' N, Long. 2°6' W, Distance from Sea 1 miles.

Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2½ feet.

During the MONTH of July 1882.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS.				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.		No. of hours in which it fell.	Amount in inches.	9 A.M.		P.M.		9 h. A.M.		Temperature of air at height of feet. No.	Temperature of surface and depth.			0—10.		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.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Barometer.	Atmospheric Thermometer.	Barometer.	Atmospheric Thermometer.	Max.	Min.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.			Velocity (0—5), and Direction.	Amount (0—10), and Species.	Velocity (0—5), and Direction.	Amount (0—10), and Species.	No.	12 inches.					No.	22 inches.					9 A.M.	9 P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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	1	20.086	57.7	30.038	57.5	60.0	47.4			57.5	53.0	53.0	51.3	S. 2	1/2	S. W.	1/2			Sp	Run	Sp	Run																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† = 29.685  
 for Temp. (Col. 2), = 29.686  
 Corrected Mean" of Barometer at 9 P.M., minus the Correction†† = 29.606  
 for Temp. (Col. 4), = 29.607  
 Mean at Station, corrected, and at 32°, = 29.605  
 Correction for height, 66 feet above Mean Sea-level, = 0.074  
 Mean, reduced to 32°, and Sea-level, = 29.679  
 Highest Reading, corrected for Index error, on the 26 th, = 30.386  
 Lowest Do. Do., on the 7 th, = 29.100  
 Difference, or Monthly Range, = 1.286

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 28 th, = 70.3  
 Lowest in Month, corrected for Index errors, on the 26 th, = 47.1  
 Difference, or Monthly Range, = 23.2  
 "Corrected Mean" of all the Highest, (Col. 5), = 63.9  
 "Corrected Mean" of all the Lowest, (Col. 6), = 51.2  
 Difference, or Mean Daily Range, = 12.7  
 \*\* Calculated Mean Temperature of Month, = 57.62  
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =  
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =  
 Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =  
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, =  
 Difference of above Means or Range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 58.48  
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 54.6  
 †† Computed Temperature of Dew-Point, = 51.2  
 †† Do. Elastic Force of Vapour, = 0.377  
 †† Do. Weight of Vapour in a Cubic Foot of Air, =  
 †† Relative



# TAKING METEOROLOGICAL 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 Louver-boarded Box for Thermometers, painted white inside and outside, and screwed to four stout posts, also painted white, firmly fixed in the ground. The posts must be such a length that the Thermometers are hung in position the Bulbs of the Minimum and Maximum Thermometers and of the Dry and Wet Bulb Thermometers will be at the same height of four feet above the ground, the maximum Thermometer being hung lower than the others. The thermometer to be placed over a plot of grass-land, and in the open space to which the sun's rays have free access (as far as possible) is to be placed in a box, the sides of which are of the dry ice surrounding conditions the Observer can best secure. The Thermometers are suspended on cross-laths 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 GROUND, AND METHOD IN PROTECTING THE THERMOMETERS AS VITAL IN THE SYSTEM OF METEOROLOGICAL OBSERVATION, SINCE WITHOUT IT OBSERVATIONS MADE AT DIFFERENT STATIONS ARE INCOMPARABLE, THUS RENDERING IT IMPOSSIBLE TO COMPARE THE CLIMATES OF PLACES WITH EACH OTHER AS FAR AS THEIR MOST IMPORTANT FEATURES.

stations made at different Stations are incomparable, thus rendering impossible to compare the Climates of places with each other as Professor Phillips, and Negretti and Zambri's Maximum Thermometers, and Rutherford's Minimum Thermometer are recommended. It is recommended that these Maximum Thermometers be graduated on the glass stem. The Minimum Thermometer is liable to two derangements—viz, the column 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 Protected Thermometers, but of frequent occurrence with exposed Thermometers. Hence a systematic examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

Let the thermometer be taken in the hand by the end farthest from the bulb, and raised above the head, and then forcibly swung down towards the subject, so that the bulb may be placed 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 still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. The patient should be detached from all spirits, and the thermometer held where the detached column of spirit is seen, and the bulb gently vibrated up and down, till the surface of the broken column is nearly level with the surface of the column below it. Care must be taken that the heat is not applied too suddenly; for, if this be done, the tube will break and the instrument be destroyed. The best way to apply the requisite amount of heat is by bringing the end of the tube slowly down towards a 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-bulb Thermometers.**—During night, have a black coating, which may easily be made, or mended, by the application of a mixture of lampblack and printer's ink. They are placed in shallow black-lacquered boxes, whose sides protect the bulbs from the sun, and 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-bulbs enclosed in glass jackets<sup>1</sup> may also be used, being indel preferable 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.

any one of these methods.

The Hygrometer in use at the Society's Stations consists of two Thermometers usually, but not necessarily, mounted on one frame. As apparently slight deviations from the approved form of this apparatus seriously vitiate the Hygrometrical Observations, Observers are specially requested not to attend to the following conditions.—The bulbs must hang down at least an inch free from the scales and frame to which they are attached; the frame must be so set as will bring the tubes forward by an inch from any board on which it may be suspended; the water-pan must be covered, and angled places to which the water is directed must be covered, and angled places to which the bulb is exposed must be covered; the bulb must be under the rack of the medium filament, and fastened at the neck of the rack of the medium filament, which also supplies it with water. It must be placed so that the water in the pan is always clean and moist, and the water pure. In frosty weather, observation is a matter of much delicacy, and must be made with great care. The bulb must be moistened 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.

In reading the Thermometer great care must be taken in bringing the eye exactly opposite the tip of the index or column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus, if the Thermometer will be read—39°·9, 40°·0, or 40°·1; or again, 40°·0, 40°·4, 40°·6, according as it indicates a little under, an exact coincidence with, or a little over 40°, or 40½°, respectively. So also 40½°, 40°·7, or 40°·8 respectively. In reading Rutherford's Minimum Thermometer, the indication of that end of the index which is next to the surface of the spirit is alone noted. On opening the Thermometer 805, the Dry and Wet Ball Thermometers are to be first, and rapidly, read, inasmuch as they are readily affected by heat from the person of the Observer.

100° F. or 40° C. more or less must be registered 40° F., or 40° C., Minimum 100° F. or 40° C. respectively. In reading, Rutherford's Minimum Thermometer, the indication of that out of the index which is next to the surface of the spirit is alone noted. On opening the Thermometer box, the Dry and Wet Bulb Thermometers are to be first, and rapidly, read, inasmuch as they are really affected by heat from the person of the Observer.

The Hygrometer is to be read at 9 a.m. and 9 p.m. The Self-Registering Thermometers are read at 9 a.m. only, as indicating the temperature at the greatest and least degrees of temperature in the 24 hours preceding.

Mode of clearing the Thermometer.

Temperature.

No instrument ought to be used for Meteorological purposes till it has been carefully tested by comparison with a Standard Thermometer. When such Thermometers, as 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 true 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 vane of Barometers in reference to their scales, and the perfect freedom of the Barometer from air; the correct number of the Self-Registering Thermometers are read, since, in which, at least, the extremes may occur at any hour; and it is necessary to prefer their exactness to their proper meteorological days. In the selection of their Society's scales, the indications registered on the 31<sup>st</sup> of these series of phenomena commencing at 9 p.m. on the 24<sup>th</sup>, and extending till 9 p.m. on the 31<sup>st</sup>.

*Verification of Thermometers.*

It has been carefully tested by comparison with a Standard Thermometer. When such Thermometers, as 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 true 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.

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July 1882

July 1882 To Mr

*ALEXANDER L.*  
*Secretary of*

BUCHAN,  
*the Meteorology*

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*Society of Scotland*

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DINBURGH.

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OBSERVATIONS		FOREST TREES.	
Alder,	• • •	Beech,	• • •
Ash,	• • •	Birch,	• • •
Elm,	• • •	Larch,	• • •
Lime,	• • •	Oak,	• • •
Sycamore or Plane	• • •		



## SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abdn. County of Aberdeen, in Lat. 57°9'N Long. 2°6'W, Distance from Sea 1 mile.  
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 22 feet. During the MONTH of August 1882.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.  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. * No.	Attach- ed Ther- mometer	Barometer. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun/rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Dirac- tion.	Force	Dirac- tion.	Force	No. of hours in which it fell.	Amount in inches.	Velocity (0-10), and Dirac- tion.	Amount, (0-10), and Species.	Velocity (0-10), and Dirac- tion.	Amount, (0-10), and Species.	No. 3 inches.	No. 12 inches.	No. 22 inches.					
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°
1		29.906	60.0	29.834	64.0	67.3	53.9			60.6	59.1	62.3	61.0	—	—	—	—		.06	st	10	lt	10	—					1		
2		29.532	65.4	29.800	59.3	66.9	54.7			65.5	57.6	55.6	49.9	W.	2	N.	3		—	cu-lt	7	cu-lt	8	8					2		
3		29.980	58.0	30.141	56.2	61.0	50.7			57.0	50.0	51.8	42.5	N.W.	3	N.	1		—	cu-lt	7	—	—	8					3		
4		30.190	56.8	30.168	57.8	64.6	46.7			57.0	51.0	53.2	54.0	N.	1½	—	—		.05	cu-lt	9	st	10	10					4		
5		30.130	60.8	30.144	61.0	70.2	52.7			63.7	59.6	61.0	57.3	N.W.	1	N.W.	½		—	cu-lt	10	cu-lt	2	12					5		
6		30.046	59.5	30.084	60.8	70.3	50.2			60.6	56.1	59.0	56.0	N.W.	½	N.	½		—	cu-lt	3	cu-lt	4	14					6		
7		30.176	59.0	30.212	58.0	67.1	53.6			58.1	53.2	54.0	51.8	N.	1½	—	—		—	st	10	—	—	8					7		
8		30.200	58.6	30.192	57.0	64.5	46.3			58.6	54.3	55.5	53.1	E.	1	N.	½		—	st	8	st	10	10					8		
9		30.240	60.0	30.262	62.0	69.7	53.9			59.2	56.8	60.1	56.4	S	½	—	—		—	cu-lt	10	cu-lt	6	10					9		
10		30.276	63.0	30.126	65.9	77.3	51.0			61.2	57.3	65.2	58.0	—	—	—	—		—	—	—	—	—	15					10		
11		30.080	68.0	29.970	67.0	83.1	52.6			73.6	64.2	64.5	59.7	W	½	S.W.	1		—	cu-lt	10	cu-lt	10	14					11		
12		29.882	65.0	29.658	63.0	71.0	54.2			63.3	59.0	59.6	57.2	S.W.	1½	—	—		—	ci	1	st	10	14					12		
13		29.812	62.5	29.678	63.0	68.0	53.9			62.1	59.0	59.3	57.9	S.W.	1	—	—		.06	cu-lt	8	st	10	2					13		
14		29.608	63.4	29.678	60.0	70.6	56.0			62.2	59.2	59.8	57.7	S.W.	1	—	—		.07	ci-cu	5	ci-st	5	10					14		
15		29.538	64.4	29.570	62.0	63.1	53.8			61.0	57.2	59.8	55.2	S	1½	S.	1		.08	Nim	8	st	10	8					15		
16		29.628	62.0	29.692	62.4	64.0	53.4			60.0	59.0	59.1	57.8	E	½	N.E.	1		.27	st	10	st	10	—					16		
17		29.768	62.0	29.760	58.2	64.5	54.9			58.1	57.0	57.0	56.6	—	—	S.S.	1		.05	st	10	st	10	6					17		
18		29.798	61.4	29.904	61.4	69.1	54.2			60.0	57.6	58.3	54.3	—	—	S.	1		—	ci-cu	8	ci-st	10	10					18		
19		29.858	62.2	29.840	61.4	67.0	50.0			60.0	52.5	56.5	54.2	S.W.	½	S.W.	1		.06	ci-lt	5	ci-st	8	8					19		
20		29.742	61.6	29.494	60.0	64.5	45.1			62.2	54.8	57.0	53.0	S.W.	1½	S.W.	2½		.05	ci	4	cu-lt	10	6					20		
21		29.328	58.0	29.292	61.6	68.1	52.9			56.5	54.0	58.0	53.0	S.W.	1	S.W.	1		.10	cu-lt	10	ci-st	8	6					21		
22		29.436	60.2	29.398	60.0	63.7	53.3			59.1	54.0	54.2	51.8	N.W.	2	—	—		.22	ci	2	st	10	8					22		
23		29.098	57.0	29.186	58.0	61.1	49.0			52.9	51.0	52.1	49.0	N.W.	1	N.W.	2		—	st	10	st	10	6					23		
24		29.240	57.0	29.318	57.6	65.2	48.5			54.7	49.8	55.8	52.8	N.W.	1½	N.W.	½		.02	ci-cu	8	cu-lt	7	8					24		
25		29.364	59.6	29.418	59.4	65.0	51.8			57.0	54.1	57.0	55.0	—	—	S.E.	½		.01	cu	3	st	10	5					25		
26		29.470	59.0	29.522	59.6	62.0	51.6			58.2	53.2	55.8	53.7	N.E.	½	N.E.	1		.17	ci-cu	9	Nim	10	3					26		
27		29.586	59.0	29.672	59.0	62.0	52.1			56.7	54.2	56.0	54.6	N.	1	—	—		.04	cu-lt	9	st	10	4					27		
28		29.502	57.4	29.316	57.2	62.6	52.6			56.9	54.2	54.2	53.0	N.	½	S.E.	1		.12	st	10	Nim	10	4					28		
29		29.310	59.0	29.528	58.2	61.3	53.2			57.2	54.8	54.4	52.6	E.	1	N.	1½		.16	Nim	10	st	10	—					29		
30		29.784	59.0	29.958	57.0	57.3	48.7			56.6	53.0	49.8	47.0	N.	1½	N.	1		.01	ci-cu	6	ci-cu	4	8					30		
31		30.012	58.0	29.856	56.0	61.6	47.8			53.0	48.1	52.0	48.0	N	½	N.E.	1		.25	ci	5	cu-lt	8	10					31		
Sums.		14512	166	15610	157	138	1215			294.3	149	177	169	7	3			8													
Means.		29.760	60.4	29.770	60.0	66.2	51.8			59.5	55.3	57.1	54.0	0.95	0.76																
† Total Corrections for Instrumental Errors.		+0.006	-0.8	+0.006	-0.8	-0.6	-0.2			-0.2	-0.4	-0.2	-0.4	0.6	0.6																
‡ Corrections for Diurnal Range.																															
“Corrected Means.”		59.6		59.2	65.6	51.6				59.3	54.9	56.9	53.6																		
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	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. 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

Thunder, much Lightning, 8 to 9 P.M.

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.	c. h. r.	" heavy rain.
cu-s.	" cumulo-stratus.	c. h. r.	" continued heavy rain.
d.	" dew.	s.	" stratus.
f.	" fog.	sc.	" squall.
fr.	" frost.	s.	" sleet.
h. fr.	" hoar-frost.	s.	" snow.
h.	" haze.	sol. h.	" solar halo.
h. d.	" heavy dew.	sq.	" squall.
hl.	" hail.	sq.	" squall.
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	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†† = 29.683  
for Temp. (Col. 2), = 29.776 - 0.093  
Corrected Mean" of Barometer at 9 P.M., minus the Correction†† = 29.694  
for Temp. (Col. 4), = 29.776 - 0.082  
Mean at Station, corrected, and at 32°, = 29.688  
Correction for height, 66 feet above Mean Sea-level, = 0.072  
Mean, reduced to 32°, and Sea-level, = 29.760  
Highest Reading, corrected for Index error, on the 10 th, = 30.276  
Lowest Do. Do., on the 23 th, = 29.098  
Difference, or Monthly Range, = 1.178

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 11 th, = 82.5  
Lowest in Month, corrected for Index errors, on the 20 th, = 45.0  
Difference, or Monthly Range, = 37.5  
"Corrected Mean" of all the Highest, (Col. 5), = 65.6  
"Corrected Mean" of all the Lowest, (Col. 6), = 51.6  
Difference, or Mean Daily Range, = 14.0  
\*\* Calculated Mean Temperature of Month, = 58.6  
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"), =  
G.S.R. on the 11th = 30.1

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 58.1  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 54.2  
†† Computed Temperature of Dew-Point, = 50.7  
†† Do. Elastic Force of Vapour, = 371  
†† Do. Weight of Vapour in a Cubic Foot of Air, = 4.15  
†† Relative Humidity, (Saturation = 100), = 76  
RAIN fell on 19 Days; Amount in Inches, = 1.85

WIND. SUMMARY.											
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	6	1	3	0	2	6	2	6	5	0.95	
P.M.	6	3	0	2	3	4	0	3	10	0.76	
Mean.	6	2	1	2	5	1	5	7	0.86		0.74 lbs

Observations made and Return verified by James Dale, Teacher in  
Gordon's College, Abdn.

(Signed)

516 516  
678 678  
719 719  
796 796







# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abdu, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.

Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2½ feet.

During the MONTH of September 1882

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.						SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.		OZONE.		GENERAL REMARKS.  As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depressure 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, at least above Ground.		Exposed Black Balls.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H.Cup Anemometer. No. —		No. of hours in which it fell.		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. * No. —	Attached Thermometer	Barometer. No. —	Attached Thermometer	Max. No. —	Min. No. —	Max. in Sun's rays	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	No. —	No. —	Velocity (0—10), and Direction.	Amount (0—10), and Species.	Velocity (0—10), and Direction.	Amount (0—10), and Species.	SUNSHINE. Hours.	No. — 8 inches.	No. — 12 inches.	No. — 22 inches.									
		inches.	°	inches.	°	°	°	°	°	°	°	°	°																							
		* No. —		No. —		No. —	No. —	No. —	No. —																											
	1	29.670	56.8	29.190	58.5	58.7	57.3			54.0	53.0	58.6	57.8	S.E.	1½	S.E.	1		.64	Nim	10	Nim	10	—								1				
	2	29.044	58.0	29.152	59.5	65.8	54.9			58.0	56.0	56.5	55.0	S.W.	½	S.W.	½		.75	Bu-ct	8	ci-st	3	1								2				
	3	29.468	58.0	29.784	56.4	57.9	51.6			57.5	55.3	52.8	51.7	N.W.	2	N.W.	2½		—	Nim	10	st	5	—								3				
	4	30.064	55.0	30.024	54.2	58.6	47.7			53.1	48.2	51.0	48.3	N.W.	½	N.W.	1		.22	st	10	ci	2	16								4				
	5	29.832	60.4	29.956	58.4	62.6	48.2			60.1	56.3	51.9	48.6	W.	2	—	—		—	ci-st	10	—	—	8								5				
	6	30.198	57.0	30.320	56.4	63.2	42.0			54.8	50.2	53.0	49.7	N.W.	½	—	—		—	ci	2	—	—	12								6				
	7	30.222	57.0	30.204	56.2	66.1	41.0			54.6	49.8	55.0	51.2	W.	1	S.W.	1		—	ci	2	st	2	12								7				
	8	30.316	58.2	30.418	54.6	64.1	50.2			57.0	50.5	52.3	48.4	N.W.	1	—	—		—	ci-en	7	—	—	12								8				
	9	30.322	58.2	30.094	58.4	63.2	41.9			57.4	53.2	57.0	54.8	S.W.	2	S.W.	½		—	ci	2	st	10	11								9				
	10	29.872	58.0	29.708	59.1	58.4	52.1			57.0	52.0	54.9	53.4	S.W.	2	S.W.	1		.04	st	10	st	10	—								10				
	11	29.574	55.0	29.562	52.2	61.0	46.6			51.2	48.0	48.2	45.0	S.W.	½	S.W.	1		—	—	—	—	—	12								11				
	12	29.618	49.8	29.604	52.6	61.8	35.3			46.3	44.7	49.8	47.0	S.W.	½	—	—		—	ci	1	ci	6	12								12				
	13	29.634	53.2	29.612	54.6	56.0	45.6			52.0	49.1	50.0	48.7	N.W.	1	N	1		.25	st	10	st	10	—								13				
	14	29.502	56.2	29.534	58.0	57.4	49.0			54.8	53.4	57.0	56.4	N.	1½	S.W.	1		.35	Nim	10	st	10	—								14				
	15	29.634	56.5	29.738	57.4	61.1	56.0			55.2	54.7	55.3	55.0	S.E.	½	S.E.	2		.01	st	10	ci-st	8	4								15				
	16	29.756	56.4	29.846	52.4	61.0	50.1			53.1	53.0	51.0	48.7	S.W.	1½	—	—		.01	st	10	—	—	6								16				
	17	29.882	54.5	29.888	52.0	61.0	45.5			53.4	49.5	49.0	46.8	S.W.	½	—	—		.05	ci-st	4	—	—	6								17				
	18	30.034	49.6	30.102	52.4	58.1	49.0			46.9	44.9	48.2	46.8	W.	1	N.W.	1		.07	st	10	—	—	6								18				
	19	30.148	55.3	30.182	57.2	59.1	47.5			52.4	51.2	52.6	51.3	N.W.	1½	N.E.	1½		.03	st	10	st	10	3								19				
	20	30.128	54.2	30.094	53.4	57.1	47.8			51.1	48.2	51.4	49.7	N	2	N	½		—	st	10	st	10	—								20				
	21	30.068	52.8	30.012	53.4	53.2	48.9			52.0	49.8	51.0	49.9	N	½	N	1		—	st	10	ci-st	10	—								21				
	22	29.956	52.4	29.882	53.4	56.6	49.0			52.2	49.9	52.8	49.9	N.E.	½	—	—		—	st	10	st	10	—								22				
	23	29.876	56.4	29.856	55.0	59.1	48.8			55.8	52.7	53.2	51.2	S.W.	½	S.W.	½		.03	ci-st	5	st	10	2								23				
	24	29.792	57.4	29.842	57.6	59.4	51.2			57.0	52.8	55.0	53.2	S.W.	1	—	—		—	ci-st	10	st	10	6								24				
	25	29.728	56.8	29.662	57.4	60.0	52.0			56.2	54.0	55.0	51.3	S.	1	S.	1		.01	cu	8	st	10	4								25				
	26	29.622	58.6	29.486	58.2	60.1	52.0			57.0	55.0	56.0	54.2	S.	1½	S.	2		.22	ci-st	5	ci-en	8	10								26				
	27	29.502	57.2	29.264	56.8	57.3	52.7			56.2	55.2	54.1	52.0	S.	1	S.W.	1		.03	st	10	cu	9	—								27				
	28	29.34	53.8	29.512	54.3	61.1	47.0			53.7	50.8	51.2	48.2	S.W.	½	W.	½		.03	ci	6	cu	8	6								28				
	29	29.504	48.6	29.572	44.4	53.0	55.6			40.6	39.1	45.8	42.7	—	—	—	—		—	st	10	st	2	4								29				
	30	29.758	48.4	29.634	53.2	57.1	58.9			46.2	44.2	53.2	50.3	W.	½	W.	2½		.08	—	—	st	10	10								30				
	31																																31			
Sums.		1413.13	1910	1444.11	1710	158	1512			138	1510	138	1613		8		4		6																	
Means.		23.82	163.7	23.758	164.6	20.01	230.0			108.8	27.7	82.7	17.2		30.5		24.0		12	23.2																
† Total Corrections for Instru- mental Errors.		x.006	—	x.006	—	—	—			50.9	53.6	51.8	50.6		1.02		0.86																			
‡ Corrections for Diurnal Range.										—	—	—	—		.06		.06																			
" Cor- rected Means."		54.7		54.7	59.1	47.5				53.4	50.9	52.6	50.2																							
No. of	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						

**BAROMETER**, "corrected Mean" at 9 A.M., minus the Correction  $\uparrow$  } = 29.730  
for Temp. (Col. 2), = 29.800 ..... - .070 }

Corrected Mean" of Barometer at 9 P.M., minus the Correction  $\uparrow$  } = 29.728  
for Temp. (Col. 4), = 29.798 ..... - .070 }

**Mean at Station, corrected, and at 32°**, ..... = 29.729

Correction for height, 66 feet above Mean Sea-level, ..... = .074

**Mean, reduced to 32°, and Sea-level**, ..... = 29.803

Highest Reading, corrected for Index error, on the 8 th, ..... = 30.418

Lowest Do. Do. on the 2 th, ..... = 29.044

Difference, or **Monthly Range**, ..... = 1.374

<b>S.-R. THERMOMETER</b> , (in shade, etc.), <b>Highest in Month</b> , (corrected for Index Errors), on the 7 <sup>th</sup> , .....	= 65.5
<b>Lowest in Month</b> , corrected for Index errors, on the 12 <sup>th</sup> , .....	= 35.1
Difference, or <b>Monthly Range</b> , .....	= 30.4
"Corrected <b>Mean</b> " of all the <b>Highest</b> , (Col. 5), .....	= 59.1
"Corrected <b>Mean</b> " of all the <b>Lowest</b> , (Col. 6), .....	= 47.5
Difference, or <b>Mean Daily Range</b> , .....	= 11.6
** Calculated <b>Mean Temperature</b> of Month, .....	= 53.13

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

G.S. Range on the 12<sup>th</sup> 26.1

<b>HYGROMETER, Mean</b> (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), .....	=	53.0
<b>Mean</b> (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), .....	=	50.4
‡ Computed <b>Temperature of Dew-Point</b> , .....	=	<del>49.8</del> 47.8
‡ Do. <b>Elastic Force of Vapour</b> , .....	=	3.39
‡ Do. <b>Weight of Vapour in a Cubic Foot of Air</b> , ... =	=	3.72
‡ <b>Relative Humidity</b> , (Saturation = 100), .....	=	<del>80</del> 82
<b>RAIN</b> fell on <u>17</u> Days; Amount in Inches, .....	=	2.82

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	1	1	2	2	10	4	6	1	1.02	
P.M.	3	1	0	2	2	8	2	3	9	0.80	
Mean.	3	1	1	2	2	9	3	4	5	0.91	=0.83

Observations made and  
Return verified by

(Signed).

James Dale

812







# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon College - Abdon, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.  
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 24 feet. During the MONTH of October 1882.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.		SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.  As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.  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.	Atta- ched Ther- mometer.	Barometer.	Atta- ched Ther- mometer.	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direc- tion.	Force	Direc- tion.	Force	Readings of the H.Cup Anemometer, No. —	No. of hours in which it fell.	Amount in Inches. No.	Velocity (0-5), and Direction.	Amount (0-10), and Species.	Velocity (0-5), and Direction.	Amount (0-10), and Species.					No. 1.	No. 2.	No. 3.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		Inches.		Inches.															9 h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</

Fine Lunar halo - 9 P.M.  
Heavy shower hail - 10.30 A.M.  
do do do 2 A.M.

NOTATION USED IN GENERAL REMARKS.			
a.	aurora.	m.	meteor.
ci.	cirrus.	ms.	meteors.
ci-cl.	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.	so. ha.	solar halo.
h.	haze.	sq.	squall.
h. d.	heavy dew.	sq. s.	squalls.
h. l.	light clouds.	t. s.	thunder.
li. sh.	light showers.	w.	wind.
li. co.	lunar corona.	w. 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†† = 29.778  
for Temp. (Col. 2), = 29.839 — .061  
Corrected Mean" of Barometer at 9 P.M., minus the Correction†† = 29.758  
for Temp. (Col. 4), = 29.822 — .064  
Mean at Station, corrected, and at 32°, = 29.768  
Correction for height, 66 feet above Mean Sea-level, = .072  
Mean, reduced to 32°, and Sea-level, = 29.840  
Highest Reading, corrected for Index error, on the th, = 30.674  
Lowest Do. Do. on the th, = 29.040  
Difference, or Monthly Range, = 1.634

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 63.4  
Lowest in Month, corrected for Index errors, on the th, = 31.9  
Difference, or Monthly Range, = 31.5  
"Corrected Mean" of all the Highest, (Col. 5), = 54.7  
"Corrected Mean" of all the Lowest, (Col. 6), = 44.7  
Difference, or Mean Daily Range, = 10.0  
\*\* Calculated Mean Temperature of Month, = 49.7  
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, = —  
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = —  
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, = —  
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = —  
Difference of above Means or Range ("exposed"), = —

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 49.2  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 46.9  
†† Computed Temperature of Dew-Point, = 44.4  
†† Do. Elastic Force of Vapour, = 29.4  
†† Do. Weight of Vapour in a Cubic Foot of Air, = —  
†† Relative Humidity, (Saturation = 100), = 84  
RAIN fell on 22 Days; Amount in Inches, = 2.94

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		0	4	3	3	8	5	0	5	3	0.87
P.M.		0	3	2	5	7	5	0	1	8	0.98
Mean.		0	3	3	4	7	5	0	3	6	0.92 = 0.85

\* 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 capillarity and Index Errors.  
†† The Diurnal Range for Scotland is as yet unknown.  
†† Practically, though not absolutely a minus correction.  
†† These "Hygrometrical Deductions" are calculated from Glaisher's Hygrometrical Tables, Second Edition only.  
‡ While the Diurnal Range is unknown, the Arithmetic Mean of Cols. 5 and 6 will be entered as the "Calculated Mean Temperature."  
Any Observations not taken under the conditions specified in the Directions on the other side, or noted at the Top of each column, must be marked as such by the observer, in each Schedule. See over.

Observations made and Return verified by

(Signed)

James Dale  
Observer







# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Aberdeen, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.  
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2 1/2 feet. During the MONTH of November 1882.  
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.  As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.  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. * No.	Attach- ed Ther- mometer.	Barometer. No.	Attach- ed Ther- mometer.	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	Headings of the H. Cup Anemometer. No.	No. of hours in which it fell.	Amount in inches. No.	Velocity (0-10), and Direction.	Amount (0-10), and Direction.	Amount (0-10), and Direction.	No. 3 inches.	12 inches.	No. 22 inches.						
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°	°
		°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°	°
	1	29.538	53.0	29.208	52.6	53.2	37.5			52.0	50.0	52.4	51.0	S.	1	S.	1 1/2			.7	st	10	st	10							1	
	2	29.408	46.6	29.356	51.0	53.8	40.5			43.2	41.6	46.6	44.2	—	—	S.W.	1/2			.6	—	—	—	—	6						2	
	3	29.428	48.0	29.008	52.0	52.2	42.1			45.2	43.2	49.0	45.1	S.W.	1	S.W.	2 1/2			.16	cu-st	6	st	10	4						3	
	4	28.936	49.0	29.240	50.2	52.9	41.7			46.6	41.8	48.9	43.7	S.W.	1	S.W.	1 1/2			—	st	10	—	—	4						4	
	5	29.392	49.5	29.404	49.1	50.0	41.9			46.3	42.8	43.6	40.8	S.W.	1 1/2	S.	1			.31	st	10	—	—	—						5	
	6	29.890	45.6	29.710	48.4	37.6	38.3			41.2	38.3	38.3	37.0	N.W.	1/2	—	—			—	cl	1	—	—	6						6	
	7	29.668	41.0	29.192	49.1	49.1	29.8			32.4	31.3	48.6	45.1	W.	1/2	S.	4			.19	—	—	cu-st	10	5						7	
	8	29.030	44.0	29.730	48.0	49.4	35.6			37.1	35.7	43.0	41.2	W.	3 1/2	W.	1/2			.65	st	2	cl-st	6	4						8	
	9	28.838	45.0	29.126	48.4	45.0	37.9			41.2	40.3	42.0	39.0	N.W.	3	N.W.	2			.30	N.W.	10	st	5	—						9	
	10	29.300	45.0	29.310	44.5	44.8	37.1			39.5	35.2	39.5	38.0	N.W.	1 1/2	N.W.	1			.15	st	6	st	4	2						10	
	11	29.650	45.6	29.404	46.2	46.1	38.1			40.0	39.0	40.1	38.1	N.W.	1	N.W.	1/2			.01	cl-st	2	st	4	5						11	
	12	30.090	47.0	30.144	45.0	45.3	32.8			38.0	36.2	35.8	34.6	—	—	—	—			.06	cl	3	cu-st	4	4						12	
	13	30.204	42.4	30.292	46.1	43.0	33.1			35.2	34.1	34.8	33.8	N.W.	1	—	—			.04	cl	6	—	—	4						13	
	14	30.258	44.1	30.152	48.6	45.0	30.2			37.6	35.4	44.1	39.0	W.	1	S.W.	1			.02	cl	8	st	2	4						14	
	15	29.896	46.2	29.650	46.0	45.1	39.6			43.2	39.2	42.0	39.8	S.	1	S.	3			.15	cl-st	8	cu-st	10	1						15	
	16	29.702	45.0	29.918	45.0	44.1	37.6			44.1	41.3	41.2	39.4	S.	1 1/2	S.	1			.10	cu-st	10	st	10	2						16	
	17	29.938	46.0	29.868	46.4	42.8	30.0			31.2	30.1	36.8	33.0	—	—	—	—			.01	cl	3	cu-st	8	2						17	
	18	29.706	43.6	29.244	45.0	42.5	35.0			38.0	36.2	41.9	40.8	S.W.	1	S.W.	3			.53	st	10	cu-st	10	—						18	
	19	29.096	44.0	29.076	45.5	42.8	31.9			38.0	36.2	32.9	31.0	W.	1	—	—			—	cu-st	8	—	—	—						19	
	20	29.198	36.0	29.490	43.0	40.0	27.5			29.7	27.2	36.8	35.2	—	—	N.W.	1			.33	cl	3	cl	8	4						20	
	21	29.654	42.0	29.586	45.0	39.0	34.3			37.1	36.1	38.6	37.0	N.	1	—	—			.26	st	4	st	10	2						21	
	22	29.100	45.4	29.190	46.0	45.2	35.4			39.2	38.6	43.2	41.2	W.	1	W.	1			.04	st	10	cu-st	2	—						22	
	23	29.188	45.2	28.902	46.0	46.4	40.0			42.4	41.0	46.0	44.2	N.W.	1	W.	1/2			.09	st	10	cu-st	9	—						23	
	24	28.914	45.2	28.866	44.2	46.5	33.1			41.2	39.0	34.0	31.8	N.W.	1/2	N.W.	1			—	cl-cu	8	st	2	5						24	
	25	28.850	38.0	28.794	43.0	39.8	32.7			36.0	34.3	36.2	34.7	W.	1	—	—			.89	st	8	cu-st	8	4						25	
	26	28.966	42.0	29.274	43.0	38.3	32.7			37.2	35.0	36.8	35.8	—	—	W.	1/2			.37	st	10	st	10	—						26	
	27	29.464	40.0	29.544	42.0	40.2	33.4			35.2	32.4	37.1	36.1	N.W.	1	N.W.	2			.33	—	—	cu	1	4						27	
	28	29.892	42.0	29.880	45.0	39.3	33.0			36.2	33.3	34.2	32.1	N.	1	N.W.	1/2			.09	—	—	st	10	4						28	
	29	29.680	45.0	29.842	45.0	42.1	32.0			41.3	39.5	42.0	40.0	N.	1	N.	2			.18	st	10	st	10	—						29	
	30	30.152	44.0	30.068	45.0	43.0	30.1			41.3	40.4	31.3	29.9	N.	1	—	—			.01	cl-st	4	—	—	4						30	
	31																															31
Sums.		15.026	135.6	15.038	192.3	144.5	154.9			286.8	221.1	168.8	152.6	25.0	31.5					6.57	180	163	80									
Means.		29.501	44.5	29.501	46.4	44.8	35.2			39.6	37.5	40.6	38.4	0.93	1.85						60	54										
† Total Corrections for Instrumental Errors.		+0.006	-0.3	+0.006	-0.3	-0.3	-0.0			-0.1	-0.2	-0.1	-0.2	.06	.06																	
‡ Corrections for Diurnal Range.																																
"Corrected Means."		29.507	44.2	29.507	46.7	44.5	35.2			39.5	37.3	40.5	38.2																			
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.		
cl-cu.	" cirro-cumulus.	n.	" nimbus.		
cl-s.	" cirro-stratus.	r.	" rain.		
cu.	" cumulus.	h. r.	" heavy rain.		
cu-s.	" cumulo-stratus.	c. h. r.	" continued heavy rain.		
d.	" dew.	s.	" stratus.		
f.	" fog.	sc.	" scud.		
fr.	" frost.	s.	" sleet.		
h-fr.	" hoar-frost.	s.	" snow.		
h.	" haze.	so.ha.	" 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†† for Temp. (Col. 2), = 29.507..... - .041..... = 29.466  
Corrected Mean" of Barometer at 9 P.M., minus the Correction†† for Temp. (Col. 4), = 29.507..... - .048..... = 29.459  
Mean at Station, corrected, and at 32°,..... = 29.462  
Correction for height, feet above Mean Sea-level,..... = .074  
Mean, reduced to 32°, and Sea-level,..... = 29.536  
Highest Reading, corrected for Index error, on the 13 th,..... = 30.292  
Lowest Do. Do., on the th,..... = 28.794  
Difference, or Monthly Range,..... = 1.498

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 2 th,..... = 53.5  
Lowest in Month, corrected for Index errors, on the 20 th,..... = 27.5  
Difference, or Monthly Range,..... = 26.0  
"Corrected Mean" of all the Highest, (Col. 5),..... = 44.5  
"Corrected Mean" of all the Lowest, (Col. 6),..... = 35.2  
Difference, or Mean Daily Range,..... = 9.3  
\*\* Calculated Mean Temperature of Month,..... = 39.8  
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),..... = 40.0  
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12),..... = 37.8  
† Computed Temperature of Dew-Point,..... = 34.9  
† Do. Elastic Force of Vapour,..... = .203  
† Do. Weight of Vapour in a Cubic Foot of Air, ... = 2.36  
† Relative Humidity, (Saturation = 100),..... = 82  
RAIN fell on 26 Days; Amount in Inches,..... = 6.57

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	0	1	0	2	4	6	8	5	0.93	
P.M.		1	0	1	0	4	5	4	7	8	1.05	
Mean.		2	0	1	0	3	5	5	8	6	0.99	= 0.98

Observations made and Return verified by James Dale - Teacher  
Gordon's College, Aberdeen

Greatest Daily Range = 19.3 on the 7 th

NA.







# SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Aberdeen, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.  
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2½ feet. During the MONTH of December

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. _____				WIND.				RAIN.		CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			TEMPERATURE of WELL at depth of feet. No. _____	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.		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.	Max.	Min.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	Velocity (0-10), and Direction.	Amount (0-10), and Species.	Velocity (0-10), and Direction.	Amount (0-10), and Species.	No. _____	3 inches.		12 inches.	No. _____	22 inches.					No. _____	9 A.M.	9 P.M.			
		* No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____	No. _____		No. _____	No. _____	No. _____					No. _____	No. _____	No. _____	No. _____	No. _____	No. _____
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°		°	°	°					°	°	°	°	°	°
1	29.946	42.0	29.948	45.0	37.2	77.4			32.0	30.1	36.1	35.0	N.W.	1	—	—	.14	cu-st	10	cu	6	3									1						
2	29.770	41.4	29.420	44.0	41.0	30.8			36.3	34.3	39.8	38.2	W.	1	S.W.	3	.49	st	10	cu-st	10	—									2						
3	29.170	44.0	28.970	44.5	45.2	38.5			42.8	41.8	43.5	42.0	S.W.	1/2	S.	2	.24	cu-st	8	st	10	—									3						
4	28.976	43.6	29.262	43.2	44.2	31.5			40.2	39.3	36.0	34.1	S.	2	S.E.	3	.50	cu-st	10	cu-st	10	—									4						
5	29.518	40.4	29.602	42.8	37.1	30.2			34.2	32.0	31.6	29.8	E.	3	N.E.	2	.26	cu-st	10	st	2	4									5						
6	29.538	39.0	29.576	41.2	34.0	28.0			31.5	30.2	31.2	30.3	E.	2	N.E.	2	.40	st	10	—	—	3									6						
7	29.348	41.2	29.620	42.0	37.0	25.8			34.2	33.1	31.8	31.0	E.	1 1/2	—	—	.30	cu-st	10	st	10	—									7						
8	29.708	39.0	29.702	42.0	37.6	24.8			26.5	26.1	35.4	34.6	S.E.	1/2	2	1	.57	st	10	st	10	1									8						
9	29.686	41.0	29.690	41.0	39.6	32.3			39.6	36.6	37.0	36.0	E.	1/2	N.E.	1	.30	cu-st	6	cu-st	9	1									9						
10	29.610	41.0	29.668	40.8	39.7	35.0			36.2	35.1	36.3	35.2	N	1 1/2	—	—	.15	st	10	—	—	—									10						
11	29.664	40.6	29.662	41.4	33.1	27.6			31.4	30.6	29.2	26.8	—	—	N	1/2	.26	st	10	cu-st	5	—									11						
12	29.604	35.5	29.660	38.6	30.0	15.4			18.0	18.0	16.0	16.0	—	—	S.	1/2	.14	ci	4	—	—	4									12						
13	29.630	35.0	29.616	39.1	30.0	11.5			23.1	22.5	22.1	21.4	—	—	—	—	.04	ci	10	st	10	—									13						
14	29.714	32.0	29.500	37.0	22.1	12.5			15.0	15.0	18.0	17.5	S.W.	1/2	S.W.	1/2	—	ci	4	—	—	4									14						
15	29.838	32.2	29.868	38.0	32.0	8.5			9.0	9.0	32.0	31.4	S.W.	1/2	S.W.	1/2	.50	st	2	st	10	4									15						
16	29.912	41.0	29.884	41.0	43.3	31.0			41.2	40.6	43.0	42.1	S.E.	1 1/2	S.E.	2	.58	st	10	st	10	—									16						
17	29.692	43.0	29.680	40.9	45.6	40.5			44.6	44.0	43.9	43.0	S.	2	S.	1/2	.38	st	10	cu-st	8	2									17						
18	29.710	42.0	29.842	45.6	46.1	41.2			45.5	40.0	45.0	44.2	S.	1	S.	1	.17	st	10	st	10	—									18						
19	29.994	45.2	30.100	45.5	46.2	42.8			45.0	44.1	43.9	43.6	S.	1	S.	1/2	.01	st	10	—	—	—									19						
20	30.032	45.0	29.642	48.0	46.0	41.0			43.8	42.9	46.0	44.0	S.W.	1/2	S.W.	3	—	st	10	ci-cu	10	—									20						
21	29.332	45.0	29.376	46.2	47.0	38.0			45.0	44.2	41.0	38.2	S.W.	1	S.W.	1	.02	st	8	ci-st	3	1									21						
22	29.390	44.0	29.164	45.4	43.4	36.7			41.2	37.3	38.3	36.8	S.W.	1	N.W.	1	.07	ci	1	st	10	5									22						
23	29.392	43.0	29.662	42.4	43.2	31.1			38.0	36.6	32.0	30.6	N.W.	1	N.W.	1	.12	cu-st	4	ci-st	2	2									23						
24	29.090	41.5	29.548	42.0	34.8	29.1			32.6	31.4	33.9	32.5	—	—	N.W.	1/2	.07	st	10	cu-st	8	2									24						
25	29.396	42.0	29.336	40.5	36.8	24.0			36.6	33.1	32.1	29.6	N.W.	1/2	N.W.	1/2	—	cu-st	8	ci-st	2	2									25						
26	29.440	41.0	29.344	43.0	34.0	26.0			34.1	32.8	26.5	26.0	N.W.	1/2	—	—	.28	st	2	cu-st	10	4									26						
27	29.256	43.0	29.012	43.0	42.0	23.0			38.4	37.2	40.0	39.0	S.E.	1 1/2	S.W.	1	.20	st	10	cu-st	4	—									27						
28	29.238	45.0	29.404	46.0	47.8	36.4			47.4	43.8	40.6	39.1	N.W.	1 1/2	N.W.	1	.60	cu	8	st	10	—									28						
29	29.064	42.4	29.240	42.6	41.2	37.2			39.4	38.9	38.4	36.2	S.	1/2	N.	1	.26	st	10	cu	5	—									29						
30	29.670	40.0	29.524	42.0	41.2	34.8			37.0	35.4	40.4	38.5	N.	1/2	W.	1	.03	ci-st	2	st	2	4									30						
31	29.710	42.4	29.668	42.0	43.1	38.0			42.2	41.7	39.0	38.2	S.W.	1 1/2	—	—	.23	st	10	st	1	1									31						
Sums.		171510	9.4	181488	117	147	1410			153	1210	149	157			8			10																		
		17.738	34.4	18.022	76.1	21.5	03.6			171.414	117.020	129.7		30.0	31.0		28	22.8		247		187	47														
Means.		29.572	41.1	29.583	42.5	39.4	30.1			35.5	34.0	35.5	34.2			0.97				8.0		6.0															
† Total Corrections for Instru- mental Errors.		+0.006	-.6	+0.006	-.6	-0.2	+1			-0.2	-0.2	-0.2	-0.2			0.6																					
† Corrections for Diurnal Range.																																					
"Cor- rected Means."		40.5		41.9	39.2	30.2			35.3	33.8	35.3	34.0																									
No. of		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						

<b>BAROMETER,</b>	"corrected Mean" at 9 A.M., minus the Correction ↑↑	=	29.547
	for Temp. (Col. 2), = 29.578 .... - .031 }		
	Corrected Mean " of Barometer at 9 P.M., minus the Correction ↑↑	=	29.551
	for Temp. (Col. 4), = 29.587 .... - .036 }		
<b>Mean at Station, corrected, and at 32°,.....</b>		=	29.549
Correction for height, 66 feet above Mean Sea-level,.....		=	.074
<b>Mean, reduced to 32°, and Sea-level,.....</b>	29.623	=	29.623
Highest Reading, corrected for Index error, on the th,.....		=	30.100
Lowest Do. Do., on the th,.....		=	28.970
Difference, or <b>Monthly Range</b> ,.....		=	1.130

<b>S.-R. THERMOMETER,</b> (in shade, etc.), <b>Highest in Month,</b> (corrected for Index Errors), on the      th,.....	=	<u>47.6</u>
<b>Lowest in Month,</b> corrected for Index errors, on the      th, .....	=	<u>8.6</u>
Difference, or <b>Monthly Range,</b> .....	=	<u>39.0</u>
" Corrected <b>Mean</b> " of all the <b>Highest,</b> (Col. 5), .....	=	<u>39.2</u>
" Corrected <b>Mean</b> " of all the <b>Lowest,</b> (Col. 6), .....	=	<u>30.2</u>
Difference, or <b>Mean Daily Range,</b> .....	=	<u>9.0</u>
** Calculated <b>Mean Temperature</b> of Month, .....	=	<u>34.7</u>

<b>S.-R. THERMOMETER, Black Bulb in Sun, Highest,</b>	(corrected for	
Index Errors), on the	th,	=
“Corrected <b>Mean</b> ,” (Col. 7), <b>of 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), <b>of Black Bulb, Min.</b>	on grass,	=
Difference of above Means or Range (“exposed”),		=

G. S. Range on the 15th. 23-2

**HYGROMETER, Mean** (corrected) A.M. and P.M. Reading of Dry  
**Bulb**, (Cols. 9 and 11), ..... = 35.3

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), ..... = 33.9

‡ Computed **Temperature of Dew-Point**, ..... = 31.7

†† Do. **Elastic Force of Vapour**, ..... = 47

†† Do. **Weight of Vapour in a Cubic Foot of Air**, ... = 2.0

## Relative Humidity, (Saturation = 100), ..... = 87

**RAIN** fell on 28 Days; Amount in Inches, ..... = 7.28

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	2	0	4	3	5	7	1	5	4	0.97	
P.M.	2	3	1	2	5	6	1	5	6	1.00	
Mean.	2	2	2	3	5	6	1	5	5	0.98	= 0.96

Observations made and  
Return verified by

{ James Dale - Teacher in  
Robert Gordon's College Abdu

(Signed).

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