

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Robert 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 *3* feet.

During the MONTH of *January* 188*9*.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.		WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>	Days of Month.	
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		9 A.M.		P.M.			9 h. A.M.							
		Barometer.	At- tached Ther- mometer	Barometer.	At- tached Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.	Velocity (0-10), and Species.	Amount (0-10), and Species.	Velocity (0-10), and Species.	Amount (0-10), and Species.		No. 8 inches.	No. 12 inches.	No. 22 inches.					
		* No.	inches.	°	inches.	°	°	°	°	°	°	°	°			No.	No.	No.	No.	0 h. A.M.	Direction.	Force.	Direction.		Force.	Direction.	Force.					°
		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
		30.136	41.2	30.248	39.8	38.2	37.6					.03	S.W.	1/2	W	1/2			1	Cl	2	Cl	4							1		
	2	30.232	38.4	30.494	37.5	35.2	25.4					—	S.W.	1/2	W	1/2			2	Cl	3	Cl	4							2		
	3	30.360	40.5	30.302	46.5	46.5	43.2					—	W.	1/2	S.W.	1/2			5	Cl	2	Cl	2							3		
	4	30.224	46.4	30.126	47.4	47.2	38.4					—	W.	1/2	S.W.	1/2			10	Cl	1	Cl	1							4		
	5	30.032	44.2	29.894	44.0	44.0	42.3					—	S.W.	1/2	S.W.	1			2	Cl	—	—	3							5		
	6	29.848	43.5	29.920	44.4	43.4	33.0					—	S.W.	1/2	—	—			2	Cl	1	Cl	3							6		
	7	29.896	40.2	29.784	41.2	39.2	27.7					—	S.W.	1/2	—	—			5	Cl	5	Cl	3							7		
	8	29.032	46.4	29.488	45.8	43.1	28.6					—	S.W.	1/2	S.W.	1			8	Cl	10	N.W.	2							8		
	9	29.268	48.2	29.028	47.6	41.4	32.5					.120	S	1/2	S	2			10	N.W.	10	Cl	—							9		
	10	29.448	44.6	29.672	43.4	38.2	33.7					.15	S	1/2	S	1/2			10	Cl	10	Cl	—							10		
	11	29.668	48.0	29.588	47.2	43.6	34.2					.02	S	1/2	S.E.	1/2			10	Cl	8	Cl	—							11		
	12	29.678	46.2	29.866	44.4	39.2	34.3					.06	S.E.	1	S.E.	1			10	Cl	10	Cl	—							12		
	13	30.048	43.6	30.132	46.8	39.4	33.8					.02	S.E.	1/2	—	—			10	Cl	6	Cl	—							13		
	14	30.136	43.5	29.980	42.6	40.1	32.8					—	S.W.	1/2	S.W.	2			10	Cl	10	Cl	—							14		
	15	29.952	47.5	29.816	46.8	41.3	35.8					—	S.E.	1	S.W.	1			10	Cl	10	Cl	—							15		
	16	29.794	47.2	29.838	42.2	40.1	38.2					.18	S	1/2	S.E.	1			10	Cl	10	Cl	—							16		
	17	29.986	43.5	29.930	43.4	41.4	38.8					.07	S.W.	1/2	S.W.	2			6	Cl	10	Cl	—							17		
	18	29.750	57.0	29.856	46.8	57.6	34.8					.06	S.W.	1	S.W.	2			10	Cl	—	—	2							18		
	19	29.928	48.4	30.048	47.2	42.6	32.2					—	W.	1	N.W.	1			4	Cl	—	—	5							19		
	20	30.082	46.8	30.136	47.0	42.4	31.6					—	N.W.	1	W	1/2			6	Cl	5	Cl	2							20		
	21	30.280	46.4	30.436	45.8	44.3	32.1					.02	N	1	N	1/2			4	Cl	2	Cl	3							21		
	22	30.460	41.0	30.344	42.5	43.8	33.2					.01	N	1/2	N.W.	1/2			5	Cl	—	—	3							22		
	23	30.352	46.2	30.360	48.2	47.1	34.3					—	—	—	W	1/2			5	Cl	6	Cl	3							23		
	24	30.310	48.5	30.244	49.1	52.8	35.2					—	—	—	W	1/2			2	Cl	3	Cl	5							24		
	25	30.114	49.0	30.024	49.6	53.2	39.1					—	W	1/2	—	—			10	Cl	10	Cl	2							25		
	26	30.164	48.6	30.336	47.8	41.2	29.7					.08	N.W.	1	N.W.	1/2			10	Cl	1	Cl	2							26		
	27	30.378	45.2	30.248	46.7	37.4	29.2					.06	W	1	W	1/2			7	Cl	10	Cl	3							27		
	28	30.048	45.6	29.846	45.3	45.2	31.3					—	W	1	W	1/2			3	Cl	10	Cl	2							28		
	29	29.412	49.2	29.658	40.2	44.6	38.5					.01	S.W.	1/2	N	1/2			10	Cl	2	Cl	2							29		
	30	29.252	41.1	29.570	40.2	45.2	33.3					.04	W	1	N.W.	1			6	Cl	—	—	2							30		
	31	29.332	49.0	29.340	49.2	58.2	37.3					.03	W	1/2	W	1/2			9	Cl	—	—	3							31		
Sums.		13 16 13	17 10	15 15 14	17 13	15 10 13	15 13					16 1 14		9		28			212		157	61										
Means.		29.943	45.5	29.952	45.0	43.9	34.2							0.79	0.90				6.8		5.1											
† Total Corrections for Instrumental Errors.		+0.06	-7	+0.06	-7									06	06						6.0											
† Corrections for Diurnal Range.																																
"Corrected Means."		29.949	44.8	29.958	44.3																											
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

NOTATION USED IN GENERAL REMARKS.					
a.	denotes aurora.	m.	denotes meteor.		
ci.	" cirrus.	ms.	" meteors.		
ci-cu.	" cirro-cumulus.	n.	" nimbus.		
ci-s.	" cirro-stratus.	r.	" rain.		
cu.	" cumulus.	h. r.	" heavy rain.		
cu-s.	" cumulo-stratus.	c. h. r.	" continued heavy rain.		
d.	" dew.	s.	" stratus.		
f.	" fog.	sc.	" scud.		
fr.	" frost.	s.	" sleet.		
h.-fr.	" hoar-frost.	s.	" snow.		
h.	" haze.	so.ha.	" solar halo.		
h. d.	" heavy dew.	sq.	" squall.		
hl.	" hail.	sqs.	" squalls.		
l.	" lightning.	t.	" thunder.		
li. cl.	" light clouds.	t. s.	" thunder storm.		
li. sh.	" light showers.	w.	" wind.		
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 $\dagger\dagger$ = *29.905*
 for Temp. (Col. 2), = *29.949* — *.044*.
 Corrected Mean" of Barometer at 9 P.M., minus the Correction $\dagger\dagger$ = *29.915*
 for Temp. (Col. 4), = *29.958* — *.043*.
 Mean at Station, corrected, and at 32°, = *29.910*
 Correction for height, *66* feet above Mean Sea-level, = *.074*
 Mean, reduced to 32°, and Sea-level, = *29.984*
 Highest Reading, corrected for Index error, on the *2nd*, = *30.494*
 Lowest Do. Do., on the *9th*, = *29.028*
 Difference, or Monthly Range, = *1.466*

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the *18th*, = *57.6*
 Lowest in Month, corrected for Index errors, on the *2nd*, = *25.4*
 Difference, or Monthly Range, = *32.2*
 "Corrected Mean" of all the Highest, (Col. 5), = *43.9*
 "Corrected Mean" of all the Lowest, (Col. 6), = *34.2*
 Difference, or Mean Daily Range, = *9.7*
 ** Calculated Mean Temperature of Month, = *39.0*
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the *th*, =
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =
 Lowest at Night, Black Bulb, (corrected for Index errors), on the *th*, =
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, =
 Difference of above Means or Range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), =
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), =
 † Computed Temperature of Dew-Point, =
 † Do. Elastic Force of Vapour, =
 † Do. Weight of Vapour in a Cubic Foot of Air, =
 † Relative Humidity, (Saturation = 100), =
 RAIN fell on *16* Days; Amount in Inches, = *1.14*

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		2	0	0	3	4	10	8	2	2	0.79
P.M.		2	0	0	3	2	8	8	3	3	0.90
Mean.		2	0	0	3	3	9	8	3	3	0.85 = 0.72

Observations made and Return verified by *James Dale, Teacher in Robert Gordon's College, Aberdeen*

(Signed)

Greatest daily range = *22.8* on the *18th*

f.g.
f.g.

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 2 1/2 feet. During the MONTH of February 1889.
 The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.		WIND.				CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.							
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.		Amount in inches.		9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer.		9 A.M.		P.M.						9 h. A.M.						
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	No.	Wet bulb.	No.	Wet bulb.	Direction.	Force.	Direction.	Force.	No.	Direction.	Amount (0-10), and Species.	No.	Direction.	Amount (0-10), and Species.					No.	3 inches.	No.	12 inches.	No.	22 inches.	
		* No.	inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°	°	°	°	°	°	°
		No.	inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°	°	°	°	°	°	°
	1	29.348	50.0	29.184	47.0	53.2	40.7																											1				
	2	28.996	45.0	28.860	43.4	39.8	30.6																											2				
	3	28.954	42.1	29.672	45.2	40.7	29.8																											3				
	4	30.212	40.5	30.836	40.2	38.6	32.5																											4				
	5	29.904	44.5	29.816	43.2	44.2	35.2																											5				
	6	29.820	41.0	29.698	42.4	37.2	33.5																											6				
	7	29.634	41.2	29.528	38.0	35.1	29.8																											7				
	8	28.916	41.5	28.954	41.8	35.7	29.5																											8				
	9	29.396	36.4	29.682	39.8	31.5	22.3																											9				
	10	29.456	37.0	29.438	36.3	31.4	24.3																											10				
	11	29.508	34.0	29.598	39.2	35.1	24.2																											11				
	12	30.106	37.2	29.962	39.0	37.2	24.4																											12				
	13	29.584	44.5	29.940	41.0	43.2	25.3																											13				
	14	29.080	44.0	29.020	39.2	44.2	31.3																											14				
	15	29.436	38.2	29.960	39.2	39.2	33.8																											15				
	16	29.490	41.8	29.248	47.5	47.2	33.4																											16				
	17	29.840	42.3	29.958	45.6	52.4	35.7																											17				
	18	29.960	49.5	29.846	50.4	56.2	38.6																											18				
	19	30.068	47.2	30.060	45.0	45.5	39.2																											19				
	20	29.810	45.4	29.990	47.6	45.1	36.8																											20				
	21	30.186	43.0	30.226	41.0	39.2	33.2																											21				
	22	30.180	42.5	30.196	41.2	41.4	34.6																											22				
	23	30.298	40.8	30.448	43.0	46.1	28.4																											23				
	24	30.308	40.5	30.258	42.4	46.3	32.7																											24				
	25	30.064	42.6	29.804	37.5	41.2	29.4																											25				
	26	29.940	44.0	29.768	41.2	39.2	33.1																											26				
	27	29.698	39.4	29.748	40.5	37.8	29.2																											27				
	28	29.898	44.4	30.036	37.2	37.8	31.1																										</					

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.	devis.	s.	stratus.
f.	fog.	sc.	scud.
h. fr.	hoar-frost.	s.	sleet.
h.	haze.	so. ha.	solar halo.
h. d.	heavy dew.	sq.	squall.
h. l.	hail.	sq.	squalls.
l.	lightning.	t.	thunder.
li. cl.	light clouds.	t. s.	thunder-storm.
li. sh.	light showers.	w.	wind.
lu. co.	lunar corona.	g.	gale of wind.
lu. ha.	lunar halo.		

TABLE FOR ESTIMATING FORCE OF WIND.

Estimated Force, 0-4.	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), = 29.719 ⁸³ 036 = 29.679
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.757 ⁸³ 036 = 29.721
 Mean at Station, corrected, and 76.4 = 29.706
 Correction for height, 66 feet above Mean Sea-level, = .024
 Mean, reduced to 32°, and Sea-level, = 29.780
 Highest Reading, corrected for Index error, on the 23 th, = 30.448
 Lowest Do. Do., on the 2 th, = 28.860
 Difference, or Monthly Range, = 1.588

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 18 th, = 56.2
 Lowest in Month, corrected for Index errors, on the 9 th, = 22.3
 Difference, or Monthly Range, = 33.9
 "Corrected Mean" of all the Highest, (Col. 5), = 41.3
 "Corrected Mean" of all the Lowest, (Col. 6), = 31.6
 Difference, or Mean Daily Range, = 9.7
 ** Calculated Mean Temperature of Month, = 36.4
 S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 18 th, = 56.2
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 41.3
 Lowest at Night, Black Bulb (corrected for Index errors), on the 18 th, = 31.6
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 31.6
 Difference of above means or range ("exposed"), = 19.7

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 56.2

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 22.3

Computed Temperature of Dew-Point, = 33.9

Do. Elastic Force of Vapour, = 41.3

Do. Weight of Vapour in a Cubic Foot of Air, = 31.6

Relative Humidity (Saturation = 100), = 9.7

RAIN fell on 27 Days; Amount in Inches, = 3.04

WIND.	SUMMARY.										Mean Velocity in miles per day.
	Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	
A.M.		10	0	0	2	1	3	4	8	0	1.30
P.M.		11	1	0	2	1	2	3	8	0	1.21
Mean.		10	1	0	2	1	3	3	8	0	1.25 = 1.56

Observations made and
 Return verified by

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

(Signed)

Greatest daily range = 17.9 on the 13 th

ABT.
J. S.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, County of Aberdeen, in Lat. 57° 4' 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 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.								SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.								HYGROMETER.				Rain.				WIND.								CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.		Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
		9 h. A.M.				9 h. P.M.				Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer. No.	9 A.M.		P.M.		SUNSHINE H.ours.	9 h. A.M.			Temperature of Water, 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. Mention the hour at which Storms, including Thunder and Lightning, began and ended.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Barometer. * No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sunrays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	Direction.	Force			Velocity (0—10), and Species.	Amount (0—10), and Species.	Velocity (0—10), and Direction.	Amount (0—10), and Species.		No. 3 inches.	No. 12 inches.	No. 22 inches.	9 A.M.		9 P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 2), = 29.802
"Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 4), = 29.811
Mean at Station, corrected, and at 32°, = 29.806
Correction for height, feet above Mean Sea-level, = .074
Mean, reduced to 32°, and Sea-level, = 29.880
Highest Reading, corrected for Index error, on the 15th, = 30.432
Lowest Do. Do., on the 19th, = 29.116
Difference, or Monthly Range, = 1.316

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 24th, = 66.2
Lowest in Month, corrected for Index errors, on the 5th, = 10.5
Difference, or Monthly Range, = 55.7
"Corrected Mean" of all the Highest, (Col. 5), = 45.1
"Corrected Mean" of all the Lowest, (Col. 6), = 33.2
Difference, or Mean Daily Range, = 11.9
** Calculated Mean Temperature of Month, = 39.2
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), =
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), =
†† Computed Temperature of Dew-Point, =
†† Do. Elastic Force of Vapour, =
†† Do. Weight of Vapour in a Cubic Foot of Air, =
†† Relative Humidity (Saturation = 100), =
RAIN fell on 22 Days; Amount in Inches, = 2.39
WIND. SUMMARY.
Direction. N NE E SE S SW W NW Calm or Variable. Mean Force. Mean Velocity in miles per day.
A.M. 5 0 3 4 2 5 4 8 0.98
P.M. 7 0 1 5 2 5 5 6 0.88
Mean. 6 0.2 4 2 5 5 7 0 0.93 = 0.86

Observations made and Return verified by James Dale, Teacher in Robert Gordon's College, Aberdeen
Greatest Daily Range = 29.1 on the 6th (Signed) JA.

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 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 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 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 nearest hour, if the observations are made at intervals of 24 hours, or at the top of the nearest hour, if the observations are made at intervals of 12 hours. 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 Anemometers, though well suited to indicate roughly variations of atmospheric pressure, are not fitted for scientific purposes. No Barometer should be used for Meteorological observation which 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 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. Atle of London, and usually called the Board of Trade Barometer, has the great convenience of requiring no adjustment of the cistern. Its scale-marks are not true inches, but so much shorter as to compensate the error that would otherwise arise from the fluctuating surface of the mercury in the cistern. This is an excellent Barometer for ordinary purposes, inasmuch as it entirely eliminates the error of observation likely to arise in setting the instrument. To show the zero point of the fixed scale when the light is not good, 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 ivory point with the surface of the mercury is indicated by a little ivory float, whose stem passes freely through the lid and case of the cistern. When the index-line on this little piston-rod is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the 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 observers' 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 glass tube, must be entirely avoided. The eye must be directly in front of the index, which is in direct contact with the glass tube, must be directly in front of the index. The eye must be directly in front of the index, which is in direct contact with the glass tube, must be directly in front of the index. The eye must be directly in front of the index, which is in direct contact with the glass tube, must be directly in front of the index.

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 air 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 untightening 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 Louvre-boarded Box for protection 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 and Zambra's, or Phillips's, whether they will act at the highest temperatures they may be required 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. 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 round 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 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 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 Ballinabry, 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, and partly from the perfect impossibility of obtaining a perfect, purely mechanical indication for observation, and partly from the defective nature of the instruments used. The Rain Gauge should not be placed on a top, but on a level piece of ground, in as open a situation as the Observer can secure for it. 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. 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 Fleming's, 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 Rain-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-snow-fall slower 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 estimated from the greater or less obscuration 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 Clouds is entered from a scale of 0 to 10; thus, when the sky over-head is wholly covered, 10, and so on.

Observations of the Clouds are made at 9 A.M. and at sunset, as illustrating the condition and the height 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, 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, 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 sunshin 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 underground 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 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, either greatly heated by the sun or cooled by nocturnal radiation. At or near the time of high

correct numbering 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 and Zambra's, or Phillips's, whether they will act at the highest temperatures they may be required 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. 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 round 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 GRADIENTS, and other points connected with storms.

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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 miles.

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

During the MONTH of April 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			SEA. Temperature at 1 fathom, and Density.	OZONE. 0-10. 9 A.M. 9 P.M.	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 Lightening, began and ended.	Dry Month.			
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs. Sun's rays.		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.	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.		No. of hours in which it fell.	Amount in inches. No.	Direction.	Force.	Direction.	Force.	Readings of the H. Cup Anemometer. No.	Velocity (0-6) and Direction.		Amount (0-10), and Species.	Velocity (0-6) and Direction.	Amount (0-10), and Species.					No. 3 inches.	No. 12 inches.	No. 22 inches.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°		°	°	°	°	°	°	°	°		°	°	°					°	°	°
	1	29.624	49.0	29.660	43.5	45.9	37.7							.13-	N.W.	1	N.W.	2	3	ci	1	cu	5								1		
	2	29.752	45.2	29.806	43.5	39.2	33.6							—	N.W.	2 1/2	N.W.	1/2	5	cu-st	2	cu	5								2		
	3	29.656	44.2	29.394	42.3	40.7	32.3							.35-	W	1 1/2	S.W.	2	10	st	10	Nim	—								3		
	4	29.410	44.6	29.594	43.2	42.1	35.8							.11	E	1 1/2	E	1	10	st	—	—	1/2								4		
	5	29.690	43.6	29.722	42.5	42.1	37.9							.09	E	1	S.E.	1/2	10	cu-st	10	st	1								5		
	6	29.600	42.5	29.670	44.6	43.1	37.2							.13	E	1	N.E.	1	10	st	10	st	—								6		
	7	29.660	43.8	29.688	44.8	41.2	37.8							.06	E	1 1/2	E	2	10	st	10	st	—								7		
	8	29.612	43.2	29.570	44.4	41.4	38.2							.12	E	1	S.E.	1	10	st	10	st	—								8		
	9	29.608	43.8	29.642	43.2	43.7	36.8							.06	E	1	E	1 1/2	8	cu	10	st	2								9		
	10	29.636	44.0	29.650	44.2	44.2	35.1							.09	E	1	E	1	10	cu-st	10	st	1									10	
	11	29.632	46.5	29.708	44.3	45.4	36.3							.26	S.E.	1/2	S.E.	1/2	10	st	10	st	—									11	
	12	29.832	48.2	29.424	48.6	47.2	38.8							.12	E	1	N.E.	1	10	cu-st	8	ci-cu	—									12	
	13	29.836	46.5	29.862	46.6	43.2	35.0							.04	N	1	N.E.	1	8	ci-cu	9	cu-st	3									13	
	14	29.874	46.3	29.894	47.2	48.2	36.4							.03	N	1	N.W.	1	7	ci-cu	9	cu-st	5									14	
	15	29.924	46.0	29.920	46.5	46.1	35.8							.02	N.W.	1	N.W.	1	9	cu-st	6	cu-st	5									15	
	16	29.940	46.5	29.854	49.0	47.2	35.1							.01	N	1	N.W.	1	10	ci-st	10	st	2									16	
	17	29.858	51.0	29.964	51.0	54.7	41.5							—	N.W.	1 1/2	S.E.	1	9	ci-cu	9	cu	5									17	
	18	29.982	51.4	29.890	53.4	60.2	42.3							—	S.E.	1/2	N.E.	1 1/2	9	cu-st	8	ci-st	8									18	
	19	29.878	55.0	29.782	56.0	57.3	45.8							.04	N.W.	1	W	1 1/2	7	ci-cu	9	cu-st	5									19	
	20	29.636	56.4	29.560	55.5	61.2	43.3							.01	W	1	W	1 1/2	6	cu	7	cu	6									20	
	21	29.446	53.2	29.332	52.0	54.6	41.5							.02	S.W.	1 1/2	S.W.	1	6	cu-st	1	st	5									21	
	22	29.532	52.1	29.666	45.4	48.1	36.8							—	N.W.	1 1/2	N.W.	1/2	6	cu	7	cu-st	6									22	
	23	29.384	51.0	29.360	48.2	47.2	37.9							.09	S	1 1/2	S.E.	1/2	10	st	4	st	4									23	
	24	29.680	50.6	29.860	47.2	43.2	37.0							.39	N.E.	1 1/2	N.E.	1	10	st	10	st	—									24	
	25	29.972	48.6	29.980	45.2	47.2	39.8							—	N.E.	1	N.	1	10	st	8	st	4									25	
	26	29.880	46.0	29.752	46.1	46.8	33.1							.02	N.	1/2	S	1 1/2	8	cu-st	10	st	5									26	
	27	29.840	52.0	29.880	51.0	54.2	41.3							.01	S	1 1/2	S	1	6	ci-cu	4	ci-st	8									27	
	28	29.782	48.6	29.608	48.0	44.3	37.5							.36	S.E.	1	S.E.	1	10	st	10	st	—									28	
	29	29.672	51.0	29.560	48.0	50.2	40.7							—	S	1	S.E.	1	5	ci-cu	9	cu-st	9									29	
	30	29.912	49.5	29.680	49.0	48.7	39.2							.33	S	1 1/2	E.	1	10	st	10	st	2									30	
	31																																31
	Sums.	21 15 9 149	21 17 148	21 16 148	21 16 148	21 16 148	21 16 148							10																			
	Means.	29.723433	29.726433	29.726433	29.726433	29.726433	29.726433							24	29 1	34	33																
	+ Total Corrections for Instrumental Errors.	x006	-7	x006	-7																												
	+ Corrections for Diurnal Range.																																
	"Corrected Means."	29.734474	29.731462																														
	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.	" meteor.		
ci-cu.	" cirro-cumulus.	n.	" nimbus.		
ci-s.	" cirro-stratus.	r.	" rain.		
cu.	" cumulus.	h. r.	" heavy rain.		
cu-s.	" cumulo-stratus.	c. h. r.	" continued heavy rain.		
d.	" dew.	s.	" stratus.		
f.	" fog.	sc.	" scud.		
fr.	" frost.	s.	" sleet.		
h.-fr.	" hoar-frost.	so.	" snow.		
h.	" haze.	so. ha.	" solar halo.		
h. d.	" heavy dew.	sq.	" squall.		
hl.	" hail.	sqs.	" squalls.		
l.	" lightning.	t.	" thunder.		
li. cl.	" light clouds.	t. s.	" thunder-storm.		
li. sh.	" light showers.	w.	" wind.		
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

NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	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.
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.	t. s.	thunder.
l.	lightning.	t. s.	thunder-storm.
li. cl.	light clouds.	w.	wind.
li. sh.	light showers.	g.	gale of wind.
li. co.	light showers.		
li. ha.	light showers.		

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), = 29.734 - .050 = 29.684
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.731 - .046 = 29.685
 Mean at Station, corrected, and at 32', = 29.684
 Correction for height, 66 feet above Mean Sea-level, = .074
 Mean, reduced to 32', and Sea-level, = 29.758
 Highest Reading, corrected for Index error, on the 25th, = 29.980
 Lowest Do. Do., on the 21st, = 29.332
 Difference, or Monthly Range, = 0.548

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 20th, = 61.2
 Lowest in Month, corrected for Index errors, on the 3rd, = 32.3
 Difference, or Monthly Range, = 28.9
 "Corrected Mean" of all the Highest, (Col. 5), = 47.5
 "Corrected Mean" of all the Lowest, (Col. 6), = 37.9
 Difference, or Mean Daily Range, = 9.6
 ** 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), =

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

Computed Temperature of Dew-Point, =

Do. Elastic Force of Vapour, =

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

Relative Humidity (Saturation = 100), =

RAIN fell on 24 Days; Amount in Inches, = 2.91

WIND.		SUMMARY.			
Direction.		N	NE	E	SE
A.M.	4	2	8	3	3
P.M.	1	5	5	2	2
Mean.	3	3	6	5	3

Observations made and Return verified by James Dale Leacher in
Robert Gordon's College, Abdn

(Signed)

Greatest daily range = 18.2 on the 17th

AM
J. G.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Gordon's College, Abdn.*, County of *Aberdeen*, in Lat. $59^{\circ}9'N$, Long. $2^{\circ}6'W$, Distance from Sea $\frac{1}{2}$ miles.

Height of Cistern of the Barometer above Mean Sea-Level 66 feet, above Ground 22 feet.

During the MONTH of *May* 188*9*.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>		Days of Month.		
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.			No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		9 h. A.M.			9 h. P.M.									
		Barometer. * No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sun-rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.				Direction.	Force.	Direction.	Force.	Velocity (0-10) and Species.	Amount (0-10) and Species.		Velocity (0-10) and Species.	Amount (0-10) and Species.	No. 3 inches.						No. 12 inches.	No. 23 inches.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°				No.	°	°	°	°	°		°	°	°						°	°
	1	29.588	51.0	29.732	46.4	49.7	41.8							.24		S.E.	1	S	1			10	st	—	—	5						1	
	2	29.638	50.0	29.830	47.4	50.1	40.5							.01		S	1	S	1 1/2			10	cu-st	10	cu-st	6						2	
	3	29.846	49.0	29.874	46.5	47.8	40.7									S.E.	1/2	S.E.	1/2			10	st	10	st	—						3	
	4	29.990	50.0	30.020	49.2	51.3	43.7									S	1	S	1/2			8	cu	10	ci-cu	7						4	
	5	29.980	47.2	29.920	47.0	48.2	41.6							.12		N.E.	1/2	E	1			10	cu-st	10	st	—						5	
	6	29.972	52.0	29.982	49.5	53.2	44.2									E	1	S	1/2			5	st	4	ci-st	7						6	
	7	29.902	52.0	29.780	49.5	52.7	40.8							.01		S.E.	1/2	S.E.	1/2			5	cu	10	st	6						7	
	8	29.730	51.6	29.774	51.4	49.2	44.7									S.E.	1/2	S.E.	1/2			10	st	10	st	—						8	
	9	29.780	51.4	29.840	51.2	55.4	45.8									S.E.	1/2	S.E.	1/2			5	ci-cu	10	cu-st	5						9	
	10	29.780	52.8	29.904	50.2	54.3	44.2							.04		S.E.	1/2	S.E.	1/2			2	st	2	st	9						10	
	11	29.924	53.2	29.974	51.2	58.2	44.6									E	1	N.E.	1			4	ci-st	10	ci-st	12						11	
	12	29.994	52.5	30.000	54.4	58.3	46.1									N.E.	1	N	1			3	ci-st	2	ci-st	13						12	
	13	30.008	51.8	29.932	51.0	55.8	46.2									N.W.	1	N.W.	1			10	st	10	st	6						13	
	14	29.840	52.2	29.846	50.5	51.8	45.7									N	1/2	S.E.	1			10	st	2	st	5						14	
	15	29.832	51.8	29.906	48.0	48.6	40.8									E	1/2	E	1			10	st	10	st	—						15	
	16	30.008	50.4	30.040	49.0	49.2	45.3									S.E.	1/2	S	1			10	st	10	st	—						16	
	17	30.074	51.6	30.032	52.0	51.7	42.6							.14		S	1/2	N.E.	1			10	st	10	st	4						17	
	18	29.854	51.8	29.852	54.0	55.1	42.1							.01		E	1/2	S	1			10	st	5	ci-st	5						18	
	19	29.922	51.6	29.988	52.4	52.2	42.7									S	1/2	S	1/2			10	st	10	st	2						19	
	20	30.040	51.8	30.060	52.4	62.2	45.1									S	1/2	S	1/2			10	cu-st	—	—	10						20	
	21	30.108	56.0	30.082	55.6	63.1	46.2									S	1/2	S	1/2			1	st	1	st	10						21	
	22	29.934	57.2	29.844	62.4	68.8	47.3									S	1/2	S.W.	1			1	st	10	st	9						22	
	23	29.790	61.4	29.708	62.0	67.5	53.6									S.W.	1	S.W.	1 1/2			4	ci-st	6	ci-st	9						23	
	24	29.560	58.1	29.570	61.2	65.3	55.1							.23		S	1	S	1			9	cu-st	10	cu-st	11						24	
	25	29.532	54.1	29.648	54.1	56.2	47.7									S.E.	1	S.E.	1/2			10	cu-st	1	cu-st	8						25	
	26	29.746	59.2	29.860	57.3	57.3	42.2									S.E.	1/2	S.E.	1			9	cu-st	2	cu-st	12						26	
	27	29.846	56.0	29.748	55.2	55.4	42.0							.01		S.E.	1	S.E.	1/2			7	cu	5	cu-st	9						27	
	28	29.574	56.2	29.490	55.4	54.1	47.6							.26		S	1/2	S	1			10	st	9	cu-st	2						28	
	29	29.498	55.2	29.540	53.0	58.2	47.3									S	1	S	1/2			10	st	5	st	7						29	
	30	29.590	56.6	29.658	53.4	57.1	46.8									S	1	S	1			5	cu	2	st	8						30	
	31	29.588	53.2	29.596	53.0	56.4	47.2							.26		S.W.	1 1/2	S	1			10	st	4	ci-st	4						31	
	Sums.	25 507	103 626	046 868	163 932	15								11	133		230	255				235	207	191									
	Means.	29.823	53.3	29.840	52.8	56.3	44.9										0.74	0.82				7.6	6.7										
	+ Total Corrections for Instrumental Errors.	+0.06	-7	+0.06	-7												0.6	0.6				7.2											
	+ Corrections for Diurnal Range.																																
	"Corrected Means."	29.829	52.629	29.846	52.1																												
	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.		
ci.	cirrus.	ms.	meteors.		
ci-cu.	cirro-cumulus.	n.	nimbos.		
ci-s.	cirro-stratus.	r.	rain.		
cu.	cumulus.	h. r.	heavy rain.		
cu-s.	cumulo-stratus.	c. h. r.	confirmed heavy rain.		
d.	depression.	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.		
hail.	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 gale
1.	Light air	3.	Very fresh	6	Violent gale

NOTATION USED IN GENERAL REMARKS.

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

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = 29.829 0.663 = 29.764

"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.846 0.663 = 29.783

Mean at Station, corrected, and at 32', = 29.774

Correction for height, 66 feet above Mean Sea-level, = 0.074

Mean, reduced to 32', and Sea-level, = 29.848

Highest Reading, corrected for Index errors, on the 21st, = 30.108

Lowest Do. Do. on the 28th, = 29.490

Difference, or Monthly Range, = 0.618

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 22nd, = 68.8

Lowest in Month, corrected for Index errors, on the 2th, = 40.5

Difference, or Monthly Range, = 28.3

"Corrected Mean" of all the Highest, (Col. 5), = 55.3

"Corrected Mean" of all the Lowest, (Col. 6), = 44.9

Difference, or Mean Daily Range, = 10.4

** Calculated Mean Temperature of Month, = 50.1 48.8

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 1st, = 66

"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 66

Lowest at Night, Black Bulb (corrected for Index errors), on the 1st, = 40.5

"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 40.5

Difference of above means or range ("exposed"), = 25.5

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 50.1

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 44.9

Computed Temperature of Dew-Point, = 44.9

Do. Elastic Force of Vapour, = 0.74

Do. Weight of Vapour in a Cubic Foot of Air, = 0.82

Relative Humidity (Saturation = 100), = 87.8

RAIN fell on 11 Days; Amount in Inches, = 1.33

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	1	2	4	10	11	2	1		0	0.74	
P.M.	1	2	2	9	4	2	1		0	0.82	
Mean.	1	2	3	9	13	2	0		0	0.78	0.618

Observations made and Return verified by

James Dale, Teacher
Gordon's College

(Signed)

Greatest daily range = 21.5 on the 22nd

WMA.
J.F.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Aberdeen, County of Aberdeen, in Lat. $57^{\circ}9' N$, Long. $2^{\circ}6' W$, Distance from Sea 1 miles.Height of Cistern of the Barometer above Mean Sea-Level 66 feet, above Ground feet.During the MONTH of June 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER.				Rain.		WIND.				CLOUDS.				SUNSHINE.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.	Days of Month.			
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer.	9 A.M.		P.M.		9 h. A.M.									
		Barometer.	Attached Ther- mometer.	Barometer.	Attached Ther- mometer.	Max.	Min.	Max. in Sun's rays	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.		Velocity (0—10), and Species.	Amount (0—10), and Species.	Velocity (0—10), and Species.		Amount (0—10), and Species.	No.	3 inches.					12 inches.	22 inches.	
		* No.	inches.	°	inches.	°	°	°	°	No.	°	No.	°			No.	°	No.	°		No.	°	No.		°	No.	°					No.	°	No.
		9 h. A.M.	°	9 h. P.M.	°	°	°	°	°	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	9 h. A.M.	°	9 h. P.M.	°	9 h. A.M.	°		9 h. P.M.	°	°					°	°	°
1	29.790	57.2	29.852	56.4	58.4	48.8											Am sp													1				
2	29.890	56.4	29.756	57.0	61.2	49.8											10	cu-st	7	ci-st	2									2				
3	29.694	57.2	29.892	58.0	64.1	50.2											1	st	1	st	7									3				
4	30.080	59.1	30.380	60.0	66.2	49.2											1	st	—	—	13									4				
5	30.494	59.2	30.482	59.6	66.4	48.3											2	ci	3	ci	13									5				
6	30.344	59.5	30.120	61.1	62.5	48.2											—	—	10	st	11									6				
7	30.170	59.5	30.148	58.2	62.3	51.5											0.08	N.E.	1	E	½									7				
8	29.960	56.4	29.828	57.2	56.8	47.2											0.03	E	1	S	1									8				
9	29.866	54.5	29.894	56.5	57.2	40.8											0.03	N.E.	½	N.E.	1									9				
10	29.940	54.6	29.990	52.6	59.8	51.2											—	N	1	E	½									10				
11	29.900	57.0	29.802	55.6	59.8	41.2											—	S	1	S.W.	1									11				
12	29.828	57.6	29.840	59.2	65.5	47.3											—	S.W.	1	Nim	½									12				
13	29.832	61.0	29.754	59.0	62.4	47.1											0.01	S.W.	1	S.W.	—									13				
14	29.830	58.4	29.810	58.6	55.7	54.2											—	W	1	W	1									14				
15	29.910	61.2	29.930	61.6	68.6	53.2											—	S	½	S.W.	½									15				
16	30.030	60.4	30.152	59.0	64.3	47.6											—	W	1	W	1									16				
17	30.194	59.0	30.254	58.2	64.2	47.3											—	S.W.	½	S.W.	1									17				
18	30.288	59.2	30.278	57.2	62.2	50.3											—	S	1	S	½									18				
19	30.448	59.6	30.240	58.2	61.2	46.1											—	S	½	E.	1									19				
20	30.244	59.6	30.152	58.2	59.8	51.4											—	E	1	E	1									20				
21	30.160	59.2	30.108	58.0	58.5	49.2											—	E	1	E	½									21				
22	30.132	58.5	30.218	59.5	67.5	50.1											—	N.E.	1	N.E.	1									22				
23	30.172	59.0	30.140	58.5	56.4	49.4											—	N.E.	½	S.E.	½									23				
24	30.094	57.2	30.178	58.3	57.4	44.2											—	E	1	—	—									24				
25	30.132	57.1	30.090	57.3	62.2	44.3											—	S.E.	½	S	1									25				
26	30.076	60.0	30.052	59.0	74.6	47.2											—	S	½	E	½									26				
27	30.030	62.8	30.048	59.5	67.3	53.0											—	S	½	E	½									27				
28	30.036	61.1	30.076	62.8	73.3	52.2											—	S.E.	½	N.E.	½									28				
29	30.058	59.5	30.070	61.6	63.5	55.2											0.01	—	—	—	—									29				
30	20.170	59.8	30.292	62.5	69.4	58.1											—	S.W.	1	N	½									30				
31	12.169	20.9	12.169	19.9	16.2	14.8																								31				
Sums.	901.498	160.8	901.826	165.4	148.7	146.78							90.72				21.5	20.0			191	178		257										
Means.	30.060	58.7	30.061	58.6	62.2	48.9											0.72	0.67			6.4	5.9												
+ Total Corrections for Instrumental Errors.	x006	-7	x006	-7													06	06																
+ Corrections for Diurnal Range.																																		
"Corrected Means."	30.066	58.0	30.067	57.9																														
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				

NOTATION USED IN GENERAL REMARKS.					
a.	denotes aurora.	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.	so. ha.	solar halo.		
h.	haze.	sq.	squall.		
h. d.	heavy dew.	sq.	squalls.		
hl.	hail.	t.	thunder.		
l.	lightning.	t. s.	thunder-storm.		
li. cl.	light clouds.	w.	wind.		
li. sh.	light showers.	5.	gale of wind.		
lu. co.	lunar corona.				
lu. ha.	lunar halo.				

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = 29.987
"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.988
Mean at Station, corrected, and at 32°, = 29.988
Correction for height, 66 feet above Mean Sea-level, = .074
Mean, reduced to 32°, and Sea-level, = 30.062
Highest Reading, corrected for Index error, on the 5th, = 30.494
Lowest Do. Do., on the 3rd, = 29.694
Difference, or Monthly Range, = 0.800

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 26th, = 74.6
Lowest in Month, corrected for Index errors, on the 9th, = 40.8
Difference, or Monthly Range, = 33.8
"Corrected Mean" of all the Highest, (Col. 5), = 63.0
"Corrected Mean" of all the Lowest, (Col. 6), = 48.9
Difference, or Mean Daily Range, = 14.1
** Calculated Mean Temperature of Month, = 56.0
S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 26th, = 74.6
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 74.6
Lowest at Night, Black Bulb (corrected for Index errors), on the 9th, = 40.8
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 40.8
Difference of above means or range ("exposed"), = 33.8

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 74.6
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 40.8
Computed Temperature of Dew-Point, = 56.0
Do. Elastic Force of Vapour, = 48.9
Do. Weight of Vapour in a Cubic Foot of Air, = 14.1
Relative Humidity (Saturation = 100), = 56.0
RAIN fell on 9 Days; Amount in Inches, = 0.72

WIND.												SUMMARY.			
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.	Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.
A.M.	1	4	2	5	8	5	2	0	1	0.72					
P.M.	1	3	8	3	6	4	2	1	2	0.67					
Mean.	1	4	6	4	7	4	2	1	1	0.70	0.249				

Observations made and
Return verified by(Signed) pro. James Dale
W.D.J. G.
J. G.Greatest daily range = 27.4 on the 26th

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abda, 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 July 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 8 P.M.				HYGROMETER.				Rain.		WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.				
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer. No. _____ 9 h. A.M.	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.		
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sun-rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.		Velocity (0—6) and Direction.	Amount (0—10), and Species.	Velocity (0—6) and Direction.		Amount (0—10), and Species.	No. 3 inches.	No. 12 inches.						No. 22 inches.	9 A.M.	3 P.M.
		* No.	inches.	°	inches.	°	°	°	°	°	°	°	°			°	°	°	°		°	°	°		°	°	°						°	°	°
	1	30.408	62.4	30.376	61.0	65.0	49.7							—	N.W.	1/2	S	1/2		4	Ca-st	10	Ca-st	5								1			
	2	30.464	59.0	30.430	58.5	59.4	54.2							—	N	1	E	1/2		10	Ca-st	—	—	6								2			
	3	30.388	62.2	30.340	61.5	61.4	49.0							—	N.E.	1/2	—			—	—	—	—	12								3			
	4	30.316	62.0	30.280	60.5	60.5	52.2							—	N	1/2	N.E.	1		10	Ca-st	10	St	6								4			
	5	30.296	59.8	30.210	59.0	63.3	53.3							—	N.E.	1/2	E	1/2		10	St	—	—	6								5			
	6	30.170	59.5	29.930	58.2	56.6	48.0							11 14 14	N	1/2	N.W.	1/2		8	Ca-st	10	St	4								6			
	7	29.712	58.5	29.580	58.0	58.8	50.1							22 22	N.W.	1 1/2	N.W.	1 1/2		10	Ca-st	7	Ca-st	2								7			
	8	29.574	58.0	29.718	57.3	57.5	47.1							22 22	N.W.	2	N.W.	1		10	Nim	10	Nim	—								8			
	9	29.868	57.0	29.880	57.5	58.4	52.4							22 22	N.W.	1/2	E	1/2		10	Ca-st	1	St	4								9			
	10	29.788	56.0	29.730	55.8	55.6	48.4							18	E	1/2	E	1/2		10	Nim	10	Nim	—								10			
	11	29.794	57.1	30.020	57.3	56.3	50.4							—	N	1	N	1/2		10	Ca-st	9	Ca-st	—								11			
	12	30.074	58.5	30.086	58.0	58.4	43.2							—	E	1/2	—	—		—	—	—	—	12								12			
	13	29.974	60.7	29.880	59.1	64.3	53.2							06	S.E.	1	S	1		2	Ca-st	10	Ca-st	8								13			
	14	29.840	60.0	29.742	58.5	62.8	51.8							07	N.W.	1/2	—	—		—	—	10	Ca-st	3								14			
	15	29.648	58.0	29.646	58.0	60.6	49.6							04	S	1/2	—	—		6	Ca-st	8	Ca-st	5								15			
	16	29.730	60.2	29.778	59.0	61.9	49.2							20	E	1	E	1/2		3	Ca	10	Ca-st	10								16			
	17	29.818	58.1	29.888	57.0	56.5	51.4							07	N	1	N.W.	1		10	Ca-st	10	Ca-st	—								17			
	18	29.838	57.2	29.812	58.0	62.2	48.2							07	N.W.	1	N.W.	1/2		10	Ca-st	10	Ca-st	4								18			
	19	29.716	57.0	29.700	58.5	63.3	48.5							45 45	N.W.	1	N.W.	1/2		10	St	10	Ca-st	4								19			
	20	29.620	59.0	29.628	58.5	61.5	51.0							82	S	1/2	N.W.	1/2		10	St	10	Ca-st	—								20			
	21	29.524	58.0	29.456	57.9	57.6	49.8							85	N.W.	1	N.W.	1		10	St	10	Ca-st	2								21			
	22	29.560	58.0	29.640	58.5	58.5	50.1							14	W	1/2	—	—		—	—	4	Ca-st	5								22			
	23	29.682	61.1	29.746	59.5	62.4	41.5							—	S.E.	1/2	S	1/2		3	Ca-st	—	—	10								23			
	24	29.690	60.0	29.556	59.2	61.8	42.2							03	S.E.	1	S	1		2	Ca-st	8	Ca-st	6								24			
	25	29.458	59.0	29.520	58.0	61.7	54.4							07	N.E.	1	N.E.	1		10	Ca-st	10	Cl	5								25			
	26	29.616	59.2	29.764	57.5	58.8	51.0							07	N.W.	1	N.W.	2		8	Ca-st	10	St	2								26			
	27	29.816	58.5	29.860	60.0	61.2	54.6							07	N.W.	2	—	—		—	—	10	Cl	6								27			
	28	29.786	59.8	29.908	60.0	65.4	54.2							—	S	1/2	S	1/2		6	Ca-st	10	St	6								28			
	29	29.996	59.5	30.008	58.6	65.6	54.0							—	S	1/2	S.W.	1		9	Ca	10	St	10								29			
	30	30.102	57.2	30.080	58.2	66.3	53.1							—	S	1/2	S.E.	1		5	Ca	6	Cl	8								30			
	31	30.046	57.6	29.960	58.3	69.3	53.4							—	S	1/2	S	1/2		8	Ca-st	10	St	7								31			
Sums.		27.312	178.1	27.128	165.1	29.9	11.2							3.42		25.0	19.5			204	233	158													
Means.		29.881	59.0	29.875	58.6	61.0	50.4								0.81		0.63			66	7.5														
+ Total Corrections for Instru- mental Errors.		+0.06	-7	+0.06	-7																														
+ Corrections for Diurnal Range.																																			
+ "Cor- rected Means."																																			
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 2), = 29.887 0.80 = 29.807
"Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 4), = 29.881 0.79 = 29.802
Mean at Station, corrected, and at 32', = 29.804
Correction for height, feet above Mean Sea-level, = 0.74
Mean, reduced to 32', and Sea-level, = 29.888
Highest Reading, corrected for Index error, on the 2 th., = 30.464
Lowest Do. Do., on the 21 th., = 29.465
Difference, or Monthly Range, = 0.999

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 31 th., = 69.3
Lowest in Month, corrected for Index errors, on the 23 th., = 41.5
Difference, or Monthly Range, = 27.8
"Corrected Mean" of all the Highest, (Col. 5), = 61.0
"Corrected Mean" of all the Lowest, (Col. 6), = 50.4
Difference, or Mean Daily Range, = 10.6
** Calculated Mean Temperature of Month, = 55.7
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), =

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

Computed Temperature of Dew-Point, =

Do. Elastic Force of Vapour, =

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

Relative Humidity (Saturation = 100), =

RAIN fell on 18 Days; Amount in Inches, = 3.42

WIND.												SUMMARY.		
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.			
A.M.	5	3	3	3	6		1	10		0.81				
P.M.	1	2	5	1	6	1	9	6		0.63				
Mean.	3	3	4	2	6	0	0	10	3	0.72				

Observations made and
Return verified byW. C. Dale
James Dale, Gordon's College

(Signed)

Greatest Daily
Range = 20.9 on the 23rd

JH.

JH.

FOR TAKING MÉTÉOROLOGICAL

The Council of the Society recommend that the E-Registering Thermometers, and the Dry and Wet Bulb Hygrometer, 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 when the Thermometers are hung in position the Bubs of the Minimum Thermometer, and of the Dry and Wet Bulb Thermometers, will be exactly at the same height of FOUR FEET above the ground, the Maximum Thermometer being hung immediately above the Minimum thermometer. The Thermometer Box is to be placed over a plot of grass, and in a free open space to which the sun's rays have free access during as much of the day as surrounding conditions allow the Observing Officer to secure. The Thermometers are suspended on cross-sticks in the Box, and face the door, which should open to the north or south, near the centre of the floor.

The Council regard the question of UNIFORMITY OF HEIGHT, and METHOD IN PROTECTING THE THERMOMETERS, as vital in every system of Meteorological Observations, and

it is Observations made at different Stations are incompatible, and it is therefore impossible to compare the Climates of places with each other as regards their most important features.

Professor Phillips, and Negretti and Zambra's Minimum Thermometers, and Negretti and Zambra's Thermometers, Thermometers, and other Thermometers, are recommended that these Thermometers be graduated on the glass stem. The Minimum Thermometer is liable to two derangements—viz, the Minimum 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 tried 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 beat 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. By this method another method must be adopted if the column of spirit in the top of the bulb be turned down, and be obliged to flow, and cautiously if the cap can be turned into the tube where the detached portion of spirit is, and the bulb be turned into vapour by the heat, will condense on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for if this be done, the 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 nearest the bulb towards a heated flame from a gas-burner; or, if gas be not at hand, a piece of heated metal will serve instead.

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

Black-Bulb Thermometers—The bulbs of these thermometers are coated with a black coating, which may easily be made, or mentioned 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 wind. 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 grass, in an open situation. Snow must not be allowed to cover either of these thermometers; nor the sun's heat to affect them. The Minimum Thermometer by distillation. Black-bulbs enclosed in glass jackets may also be used, being indelible 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.

The Hygrothermometer in use at the Society's Stations consists of two dry and two wet bulbs on one frame. As apparently slight deviations from the Hygrothermometer 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

detached; the frame must be such as will bring the tubes forward from any inch from any board on which it may be suspended; the water must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but no case under the bulbs; the thermometer must be of medium fineness, and instead of the usual muslin must be of medium fineness, with water. It must be seen by the Observer that the muslin is always clean and moist, and that the water is always fresh. In frosty weather, observation is a matter of much delicacy, and must be made with great care. The bulb must be immersed by immersion from 15 to 30 minutes before the hour of observation. From the film of ice thus formed evaporation will be observed as from the moist cloth in ordinary circumstances.

proceed as from the most common ordinary method, to having the eye placed opposite the tip of the index. In reading the Thermometer greatest care must be taken to ascertain the contents of a degree, and noted in decimals. Thus, the Thermometer will be read—39°.8, 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°, 40¾, and 40¾, more or less, may be registered 40°·2, 40°·3, and 40°·4, 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 before. Hour of observing (the greatest and least degrees of temperature in the 24 hours preceding.)

indifference when the Self-Registering Thermometers are read, since in winter at least, the extremes may occur at any hour; and it is necessary to refer their occurrence to their proper meteorological day. In the Society's schedules, the indications registered on the 24th are those of a series of phenomena commencing at 9 p.m. on the 23d, and extending till 9 p.m. on the 31d.

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 dry bulb of the Hygrometer. The freezing-point of each Thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

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

water, in cases where the observations cannot be taken daily, observation may be made on the 5th, 15th, and 25th of each month. When convenient, extra Sea Observations might be taken for other days and greater depths, noting also the Temperature of the Air and the Hour of Observation. It is also very desirable that observations on the daily Maxima and Minima by Thermometers continually immersed, be substituted at points where the coast is not so exposed to the wind. The Temperature of the water at the bottom of Wells ought, when practicable, to be taken, both the depth of the well and of the water being noted.

mention what Text-Papers we used. Schönbrunn, Mödlin's, etc. The Paper is affixed by a pin to a board in the Observatory, in the magnetic Box, and the indications registered at 9 A.M. and 9 P.M. If it is desired that these indications be registered in connection with the force and direction of the wind at the time of any observation, in the following manner—thus 3 N.W. , as an Ozone early in the schedule will indicate that the Ozone paper is tilted 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

Remarks. The use of such rules can be very much abused, and is not to be assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are in general use is given at the foot of the column. Besides special and extraordinary contractions, 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, &c. Remarks ought to be made on the occurrence of Meteors, Auroræ Boreales, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail,

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 occupied, or ruled off for the purpose, from the column of 'Remarks.' Observations in connection with the Periodic Return of the

Observations in Seasons, possess of only great scientific value, but in connection with are of considerable importance in connection with the Periodic Re-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 species sown 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.

Meteorological Secretary, in order that every instrument may be examined and improved before being used; and they consider it necessary that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

A. B.
(By Order)

Edinburgh, December 1888.

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DATE	DESCRIPTION	AMOUNT	BALANCE
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Barley,	Bere or I	Oats,	Wheat,	Beans,	Pease,	Potatoes,	Turnips,	Rye Grass
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[illegible][illegible]

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

BOOK POST.

BOOK POST.

[illegible]

FOREST TREES.	In Flower.	Leaf buds first appear.	In Leaf.	Divested of Leaves.	GROUPS, mentioning variety.	Planting.	Sowing or above Ground.	Appearing.	In Ear.	First Out or raised.
Alder,					Birch,					
Ash,					Bere or Birg,					
Beech,					Oats,					
Birch,					Wheat,					
Elm,					Beans,					
Larch,					Potatoes,					
Lime,					Turnips,					
Oak,					Rye Grass,					
Sycamore or Plane,										

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	First in generally.	MIGATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Quince,		
Bourtree or Elder,		Black Currant,			House-Swallow,		
Broom,		Cherry,			Lapwing,		
Hazel,		Gean,			Plover,		
Hawthorn,		Gooseberry,			Sand-Martin,		
Holly,		Peach,			Starling,		
Laburnum,		Pear,			Swan,		
Lilac,		Plum,			Rail or Corn Crake,		
Melrose,		Strawberry,					
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Vibin,							

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

Have the goodness also to state any information you may be able to collect relative to the crops of grain, hay, potatoes, turnips, fruits, etc., whether plentiful, or in perfection; whether any have suffered from blight, disease, etc. Whether zoonotic disease prevails among cattle; and the Agricultural condition of the district generally.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abbe, 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 August 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.		WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS.		Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	No. of hours in which it fell.	Amount in inches.	Direction.	Force.	Direction.	Force.	Velocity (0-10), and Species.	Velocity (0-10), and Species.	No. 8 inches.	No. 12 inches.		No. 22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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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.
h.-fr.	hoar-frost.	s.	sleet.
h.	haze.	so. ha.	solar halo.
h. d.	heavy dew.	sq.	squall.
h.	hail.	sqs.	squalls.
l.	lightning.	t.	thunder.
li. cl.	light clouds.	t. s.	thunder-storm.
li. sh.	light showers.	w.	wind.
li. co.	lunar corona.	g.	gale of wind.
li. ha.	lunar halo.		

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{1}{1000}$ for Temp. (Col. 2), = 29.618
"Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{1}{1000}$ for Temp. (Col. 4), = 29.631
Mean at Station, corrected, and at 32°, = 29.624
Correction for height, feet above Mean Sea-level, = .074
Mean, reduced to 32°, and Sea-level, = 29.698
Highest Reading, corrected for Index error, on the 31st, = 30.198
Lowest Do. Do., on the 20th, = 29.030
Difference, or Monthly Range, = 1.168

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 2th, = 71.8
Lowest in Month, corrected for Index errors, on the 25th, = 45.4
Difference, or Monthly Range, = 26.4
"Corrected Mean" of all the Highest, (Col. 5), = 62.0
"Corrected Mean" of all the Lowest, (Col. 6), = 50.9
Difference, or Mean Daily Range, = 11.1
* Calculated Mean Temperature of Month, = 56.4
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 2th, = 71.8
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 71.8
Lowest at Night, Black Bulb (corrected for Index errors), on the 25th, = 45.4
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 45.4
Difference of above means or range ("exposed"), = 26.4

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 53.6Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 50.9Computed Temperature of Dew-Point, = 50.9Do. Elastic Force of Vapour, = 0.95Do. Weight of Vapour in a Cubic Foot of Air, = 0.79Relative Humidity (Saturation = 100), = 0.87RAIN fell on 24 Days; Amount in Inches, = 5.36

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

Observations made and Return verified by James Dale, Teacher in Robert Gordon's CollegeGreatest Daily Range = 17.9 on the 31st

7A

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abbeyside, County of Aberdeen

, in Lat. $57^{\circ}9'$, Long. $2^{\circ}6'$, 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 September 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE. H.ours.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.			No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		No. of the H. Cup Anemometer.	9 h. A.M.		P.M.		9 h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.				Direction.	Force.	Direction.	Force.		Velocity (0—10), and Species.		Velocity (0—10), and Species.	No. 8 inches.	No. 12 inches.					No. 22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	cirrus.	ms.	meteora.
ci-cu.	cirro-cumulus.	h.	hail.
ci-s.	cirro-stratus.	r.	rain.
cu.	cumulus.	h. r.	heavy rain.
cu-s.	cumulo-stratus.	c. h. r.	continued heavy rain.
d.	dew.	s.	stratus.
f.	fog.	sc.	scud.
h.	hoar-frost.	s.	sleet.
h-fr.	hoar-frost.	s.	snow.
h.	haze.	so. ha.	solar halo.
h. d.	heavy dew.	sq.	squall.
h.	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. ha.	lunar halo.		

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 2), = 29.889
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 4), = 29.894
 Mean at Station, corrected, and at 32°, = 29.892
 Correction for height, feet above Mean Sea-level, = .074
 Mean, reduced to 32°, and Sea-level, = 29.966
 Highest Reading, corrected for Index error, on the th, = 30.448
 Lowest Do. Do., on the th, = 29.348
 Difference, or Monthly Range, = 1.100

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 70.1
 Lowest in Month, corrected for Index errors, on the th, = 35.4
 Difference, or Monthly Range, = 34.7
 "Corrected Mean" of all the Highest, (Col. 5), = 57.8
 "Corrected Mean" of all the Lowest, (Col. 6), = 47.1
 Difference, or Mean Daily Range, = 10.7
 ** Calculated Mean Temperature of Month, = 52.4
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, = 70.1
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 70.1
 Lowest at Night, Black Bulb (corrected for Index errors), on the th, = 35.4
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 47.1
 Difference of above means or range ("exposed"), = 34.7

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 52.4

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 52.4

Computed Temperature of Dew-Point, = 52.4

Do. Elastic Force of Vapour, = 52.4

Do. Weight of Vapour in a Cubic Foot of Air, = 52.4

Relative Humidity (Saturation = 100), = 52.4

RAIN fell on 14 Days; Amount in Inches, = 1.08

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		6	1	0	5	5	2	4	7		1.02
P.M.		5	4	0	3	6	3	4	5		1.07
Mean.		5	3	0	4	5	3	4	6	0	1.04 = 1.08

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

(Signed) James Dale
 Greatest Daily Range = 23.9 on the 26th

77

OK

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abdy County of Aberdeen

, in Lat. $57^{\circ}9'N$, Long. $2^{\circ}6'W$, 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 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.		WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			SEA. Temperature and Direction, and Density.	OZONE.		GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>		Days of Month.		
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer.		9 A.M.		P.M.			9 h. A.M.				0-10.						
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	Max. in Sun/shade.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	No. of hours in which it fell.	Amount in inches.	Direction.	Force.	Direction.	Force.	No.	Velocity (0-10), and Species.	Amount (0-10), and Species.	No. 8 inches.		No. 12 inches.	No. 22 inches.	9 A.M.		P.M.						
		* No.		No.		No.	No.	No.	No.																										
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°		°	°	°		°	°				°	°
	1	30.078	51.2	30.090	50.4	53.3	42.1							07		N.W.	1	N.E.	1		4	ci-cu	10	st	5							1			
	2	29.972	51.0	29.808	51.6	51.5	40.3							—		N	1/2	N	1		4	ci-cu	10	st	6							2			
	3	29.756	52.2	29.648	52.3	52.4	44.3							20		N	1/2	N	1/2		10	ci-cu	10	Nim	1							3			
	4	29.570	54.3	29.506	54.6	53.3	46.2							11		S.W.	1	S.W.	1/2		9	cu	5	cu	3							4			
	5	29.556	54.8	29.536	54.2	52.5	43.4							08		S.W.	1	S.E.	1/2		8	cu	9	cu	4							5			
	6	29.440	54.2	29.440	54.2	49.7	44.8							51		S.W.	1	S	1		10	st	10	cu-st	2							6			
	7	28.758	54.0	28.728	53.4	53.5	45.4							21		S.E.	2	S	1		10	cu-st	10	st	—							7			
	8	29.020	52.4	28.960	48.6	50.8	42.7							19		S.W.	1/2	W	1/2		—	—	10	Nim	5							8			
	9	28.820	47.2	28.860	47.6	49.2	34.1							06		S.W.	1	S	1/2		2	st	4	ci-st	5							9			
	10	29.116	48.3	29.248	57.3	53.6	33.2							02		S.E.	1	S	1		8	cu	5	ci	6							10			
	11	29.400	49.2	29.532	56.4	56.4	36.3							—		S	—	S	1/2		2	ci	1	ci	8							11			
	12	29.600	52.1	29.610	52.4	52.3	43.1							51		N	1	N	1		5	ci-cu	10	st	2							12			
	13	29.742	52.2	29.824	51.8	52.4	37.1							07		N	1/2	N	1/2		10	cu-st	9	cu	2							13			
	14	29.900	47.8	29.830	49.2	50.6	34.6							—		N.E.	1/2	N	1		5	ci-cu	—	—	6							14			
	15	29.742	50.4	29.610	53.6	53.8	36.7							10		S.W.	—	S.W.	1/2		10	st	10	st	1							15			
	16	29.658	53.3	29.704	53.0	53.3	35.2							19		W	—	W	1		10	st	10	st	—							16			
	17	29.716	52.7	29.634	52.1	50.1	46.9							54		N.E.	1/2	S.E.	1/2		10	st	10	st	—							17			
	18	29.650	53.8	29.540	54.2	52.1	45.2							08		S	1	S	2		10	st	9	cu	1							18			
	19	29.432	53.8	29.452	52.7	52.3	48.1							07		S.E.	2	S.E.	1 1/2		10	st	10	st	1							19			
	20	29.494	53.5	29.570	54.2	53.8	47.2							—		E	2	E	1 1/2		7	cu-st	10	st	2							20			
	21	29.640	53.4	29.732	52.0	50.2	49.8							09		E	1	E.	1 1/2		6	cu	10	st	2							21			
	22	29.816	52.5	29.862	51.2	50.2	47.1							11		E	1	E.	1		8	cu	10	cu-st	2							22			
	23	29.952	53.2	30.034	50.1	47.6	45.4							06		E	1	E	1		10	st	10	st	2							23			
	24	30.144	48.2	30.258	46.7	49.3	39.1							03		S.E.	1/2	S.E.	1/2		10	st	10	st	4							24			
	25	30.330	47.6	30.336	49.2	47.2	36.8							02		E	—	S.E.	1/2		10	st	10	st	2							25			
	26	30.388	46.8	30.410	49.2	45.2	38.7							09		S	1/2	S	1		10	ci-cu	10	st	—							26			
	27	30.198	49.4	30.072	50.8	47.2	39.8							12		E	1/2	E.	—		10	cu-st	10	cu-st	—							27			
	28	29.880	48.1	29.772	43.8	47.3	39.7							07		N	1/2	N	1		8	ci-cu	4	ci	1							28			
	29	29.698	47.6	29.508	51.2	45.8	32.4							03		S.W.	1	S.W.	1/2		10	Nim	10	st	1/2							29			
	30	29.470	52.2	29.308	51.4	53.2	39.3							06		S.W.	1 1/2	S.W.	1		10	st	10	st	—							30			
	31	29.570	48.0	29.648	49.2	50.2	36.3							—		W.	1	W.	1		2	ci-cu	3	ci	5							31			
	Sums.	20.558	360	20.060	466	40.3	31.8							357			254		290			238		259		78									
	Means.	29.663	51.2	29.647	51.5	51.3	41.0										0.82		0.94			7.7		8.4											
	+ Total Corrections for Instrumental Errors.	+006	-7	+006	-7	-2											0.6		0.6			8.0													
	+ Corrections for Diurnal Range.																																		
	"Corrected Means."																																		
	No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				

NOTATION USED IN GENERAL REMARKS.					
a.	denotes aurora.	m.	denotes meteor.		
ci.	" cirrus.	ms.	" meteors.		
ci-cu.	" cirro-cumulus.	n.	" nimbus.		
ci-s.	" cirro-stratus.	r.	" rain.		
cu.	" cumulus.	h. r.	" heavy rain.		
cu-s.	" cumulo-stratus.	c. h. r.	" confirmed 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.	sqa.	" squalls.		
l.	" lightning.	t.	" thunder.		
li. cl.	" light clouds.	t. s.	" thunder-storm.		
li. sh.	" light showers.	w.	" wind.		
lu. co.	" lunar corona.	5°	" gale of wind.		
lu. ha.	" lunar halo.				

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 2), = 29.661
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 4), = 29.595
 Mean at Station, corrected, and at 32', = 29.603
 Correction for height, feet above Mean Sea-level, = .074
 Mean, reduced to 32', and Sea-level, = 29.677
 Highest Reading, corrected for Index error, on the th, = 30.410
 Lowest Do. Do., on the th, = 28.728
 Difference, or Monthly Range, = 1.682

S-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 56.2
 Lowest in Month, corrected for Index errors, on the th, = 32.9
 Difference, or Monthly Range, = 23.3
 "Corrected Mean" of all the Highest, (Col. 5), = 51.1
 "Corrected Mean" of all the Lowest, (Col. 6), = 41.0
 Difference, or Mean Daily Range, = 10.1
 ** Calculated Mean Temperature of Month, = 46.0
 S-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, = —
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = —
 Lowest at Night, Black Bulb (corrected for Index errors), on the th, = —
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = —
 Difference of above means or range ("exposed"), = —

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = —
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = —
 ** Computed Temperature of Dew-Point, = —
 ** Do. Elastic Force of Vapour, = —
 ** Do. Weight of Vapour in a Cubic Foot of Air, = —
 ** Relative Humidity (Saturation = 100), = —
 RAIN fell on 26 Days; Amount in Inches, = 3.57

WIND.		SUMMARY.	
Direction.	N N E S S W W N W	Calm or Variable.	Mean Force.
A.M.	6 2 6 5 3 6 2 1		0.82
P.M.	7 1 5 5 7 3 3		0.94
Mean.	6 2 5 5 5 4 3 1	0	0.88 = 0.77

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

Greatest Daily Range, = 26.2

FOR TAKING METEOROLOGICAL

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Louvre-boarded Box, painted white inside and outside, and placed in a level position, so as to be exposed to the sun and shade equally, and removed from all obstructions, except those of four stout posts, also painted white, firmly fixed in the ground. The posts must be 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, the Maximum Thermometer being hung immediately above the Minimum thermometer. The thermometer is to be placed over a plot of ground, and in a free open space to which the sun's rays have free access during as much of the day as surrounding conditions enable the Observer to secure.

The thermometers are suspended on cross-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, LEVEL GROUND, AND METHOD IN PROTECTING THE THERMOMETERS, as vital in every system of Meteorological Observation, since without it all 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 Minimum Thermometers, and Kutherford's with protected Thermometers, being a systematic series of instruments, and having been frequently used by Professor Self-Registering Thermometers, are recommended. It is recommended that these thermometers be graduated on the glass stem. The minimum thermometer is liable to two arrangements—viz., the louver of spirit bracking, and part of the spirit distilling by high temperature and lodging at the top of the tube. This arrangement 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 right by

that it Observations made at different Stations are incompatible, and 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 their self-registering counterparts, and the Minimum Thermometers, are recommended. It is recommended that these Thermometers be graduated on the Fahrenhheit scale. These thermometers are of glass, and are of the spirit distilling by high vacuum, and are of the spiral, and of the straight tube, and of the occasional occurrence with protected Thermometers, but of the 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 right by

any one, when the column of spirit chanced 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 knee; the object being, on the principle of centrifugal force, to dash 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 no other method must be adopted, if the portion of spirit in the top of the tube be sunken, as the heat should be applied above the column, and the top of the tube raised up, so that the heat will condense on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for, if this be done, the 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; or, if gas be 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 from the earth, must be made of glass, and not of metal.

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 blackened boxes, whose sides protect the bulbs from the wind. 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 grass, in an open situation. Now the sun's heat is affected by other of these Thermometers. Show the sun's heat to affect the minimum Thermometer by distillation. Black-balls enclosed in glass jackets may also be used, being indeed preferable to the above. It must, however, be added, that the whole subject of the observation of Solar Terrestrial Radiation is so vast, in a sufficient

The Hygrometer in use at the Society's Stations consists of two Thermometers usually, but not necessarily, mounted vertically and wet Bulb on one frame. As apparently slight deviations from the approved form of this apparatus seriously vitiate the Hygrometrical Observations, Observers are specially requested to attend to the following conditions:—The bulbs mustang down

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 as much as possible, and the water must be so regulated as to keep the air very much from any board on which it may be suspended; and the water must be covered, and altogether placed to the side, and a little below the level of the vet. bulb, but in no case under the bulbs, the water must be of medium fineness, and fastened at the neck of the bottle by the cotton, which also supplies it with water. It must be seen by the Observer that the muckin is always clean, and moist, and that 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 column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus the Thermometer will read $-39^{\circ}.4$, $40^{\circ}.0$, or $40^{\circ}.1$; or again, $0^{\circ}.4$, $40^{\circ}.6$, according as it indicates a little under, coincident with, or a little over 40° , or $40^{\circ}.5$, respectively. So also $40^{\circ}.5$ and $40^{\circ}.6$ may or less must be registered $40^{\circ}.4$, $40^{\circ}.3$, and $40^{\circ}.2$, respectively. In reading Bartherford's Minimum Thermometer the indication of that end of the index which is next to the surface of the spirit is alone noted. On operating 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 Thermometer is read at 9 A.M. and 9 P.M. only, as in the course of observing the greatest and least degrees of temperature during the four hours preceding. It is not matter of 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 unattached scale, undergo repairs, they are very liable to be moved from their position on the Scale, and ought never afterwards to be used without being re-tested. The Self-Registering, especially the minimum Thermometers, ought frequently to be compared with the dry bulb of the Hygrometer. The freezing-point of each thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

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

observation, in cases where the observations cannot be taken daily, the observations may be made on the 5th, 15th, and 25th of each month. When convenient, extra Sea Observations might be taken for other purposes, 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. Svenson, 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 Temperature of walls. Well and of the water being noted. Mention what Test-Papers are used, Schönbein's or Moffet's, etc. The Paper is affixed by a pin to a board in the Thermometer Box, and the indications registered at 9 A.M. Ozone.

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 $3^{00}N.E.$, as an Ozome entry, in the schedule will indicate that the Ozome paper is fasted 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 ferromagnetic, trial 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

Remarks.— Those for which no rules can be given not being assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are in general use is given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevailing Diseases, differences in character, colour, velocity, and direction, between the Lower and Upper Strata of clouds, the 'Colour of the Sky, &c. Remarks ought to be made on the occurrence of Meteors, Auroræ Boreales, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail,

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 omitted, 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

connection with are of considerable importance in connection with the Periodic Review of Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena, so that the published Summaries may fairly represent the whole of Scotland. Observations ought to be confined to individual trees and shrubs; to particular species of birds, and, in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm. The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention

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 needless that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

A. B.
(By Order)

EDINBURGH, December 1388.

Page 47

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Year.	Divested of Leaves.	Good mentionning
		Barley,
		Bare or D
		Oats,
		Wheat,
		Beans,
		Pease,
		Turnips,
		Potatoes,
		Rye Grass

[illegible]

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

Worcester
October 1889

To the *SECRET*

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SECRET

BOOK POST

ETARY

Scottish Meteorological

122 *Geo*

Society,
George Street,
EDINBURGH.

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ative to the Cr
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t generally.

Effect relative to the control group

	m.
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Mountain Ash or Rowan
Red Flowering Currant,
Rhododendron Ponticum,
Whin,

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

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

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 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.		WIND.				CLOUDS.				SUNSHINE. H.ours.	THERMOMETERS under Ground.			Temperature of Well at 8 A.M. 1st. S.O.	SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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		Barometer. * No. inches.	Attached Thermometer. No. °	Barometer. No. inches.	Attached Thermometer. No. °	Max. No. °	Min. No. °	Max. in Sun/ways No. °	Min. on Grass. No. °	Dry bulb. No. °	Wet bulb. No. °	Dry bulb. No. °	Wet bulb. No. °			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.	No. 12 inches.						No. 22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

NOTATION USED IN GENERAL REMARKS.			
a.	denotes aurora.	m.	denotes meteor.
ci.	cirrus.	ms.	meteors.
ci-cu.	cirro-cumulus.	n.	nimbus.
ci-st.	cirro-stratus.	r.	rain.
cu.	cumulus.	h. r.	heavy rain.
cu-s.	cumulo-stratus.	c. h. r.	continued heavy rain.
d.	dew.	s.	sleet.
f.	fog.	sc.	scud.
fr.	frost.	s.	snow.
h. fr.	hoar-frost.	so. ha.	solar halo.
h.	haze.	sq.	squall.
h. d.	heavy dew.	sgs.	squalls.
h.	hail.	t.	thunder.
li.	lightning.	t. s.	thunder-storm.
li. cl.	light clouds.	w.	wind.
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), = 30.004 - .054 = 29.950
"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 30.004 - .054 = 29.950
Mean at Station, corrected, and at 32°, = 29.950
Correction for height, feet above Mean Sea-level, = .074
Mean, reduced to 32°, and Sea-level, = 30.024
Highest Reading, corrected for Index error, on the th, = 30.570
Lowest Do. Do., on the th, = 28.924
Difference, or Monthly Range, = 1.646

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 62.2
Lowest in Month, corrected for Index errors, on the th, = 28.8
Difference, or Monthly Range, = 33.4
"Corrected Mean" of all the Highest, (Col. 5), = 47.8
"Corrected Mean" of all the Lowest, (Col. 6), = 36.7
Difference, or Mean Daily Range, = 11.1
** Calculated Mean Temperature of Month, = 42.2
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, = 62.2
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 62.2
Lowest at Night, Black Bulb (corrected for Index errors), on the th, = 28.8
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 28.8
Difference of above means or range ("exposed"), = 33.4

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 62.2
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 51.4
Computed Temperature of Dew-Point, = 51.4
Do. Elastic Force of Vapour, = 0.87
Do. Weight of Vapour in a Cubic Foot of Air, = 0.88
Relative Humidity (Saturation = 100), = 0.88
RAIN fell on 13 Days; Amount in Inches, = 1.33

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.	2					1	8	11	7	1	0.87
P.M.	2				1	9	10	6	2		0.88
Mean.	2	0	0	1	0	9	10	7	1		0.88 = 0.77

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

(Signed) W.H.A.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abdee, 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 Dec. 18 1889.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE. H.ours.	THERMOMETERS under Ground.			SEA.	OZONE.		GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.				
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs. Sun's rays, Grass.		9 h. A.M.		9 h. P.M.			9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.			9 h. A.M.		9 h. 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.		No. of hours in which it fell.	No.	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.		No. 12 inches.	No. 22 inches.			Temperature of WELL at depth of feet, No.	Temperature at 1 fathom, and Density.	9 A.M.	9 P.M.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°		°	°	°	°	°	°	°	°		°	°	°		°	°			°	°	°	°
	1	30.132	47.5	30.224	47.4	43.3	36.7							—	—	S.W. 1/2	S. 1/2		10	St	10	St	—							1					
	2	30.330	46.8	30.360	47.2	44.3	30.8							—	—	S.W. 1/2	S.W. 1/2		10	St	10	St	2							2					
	3	30.340	46.7	30.430	47.2	43.4	35.8							—	—	S.W. 1/2	S.W. 1/2		10	St	10	St	—							3					
	4	30.530	47.4	30.570	45.4	41.2	36.1							.06		S.W. 1/2	S.W. 0		10	St	10	St	1							4					
	5	30.616	45.5	30.624	44.6	40.2	36.8							.03		S. 0	S. 0		10	St	2	St	—							5					
	6	30.404	43.5	29.996	43.2	40.3	35.1							.31		S.W. 1 1/2	S.W. 1		10	St	10	St	2							6					
	7	30.052	44.4	30.058	41.2	40.4	33.3							—		N 1/2	N 1		1	St	—	—	3							7					
	8	29.932	44.2	29.080	44.6	42.3	39.4							.13		N.W. 1	W 1		10	St	10	N.W.	—							8					
	9	29.420	49.2	29.140	45.2	53.2	36.1							—		W 1	W 1		10	St	—	—	2							9					
	10	28.820	47.2	29.008	43.8	41.7	34.5							.15		W 1	W 1 1/2		6	St	2	St	2							10					
	11	29.308	42.8	29.604	41.2	35.2	32.8							.04		N.W. 1	N 1 1/2		5	St	6	St	1							11					
	12	29.812	47.1	29.524	46.2	36.2	25.1							.26		N.W. 1/2	S.W. 1 1/2		2	St	10	St	1							12					
	13	29.420	47.4	29.870	39.8	43.1	24.2							—		W 1	W 0		2	St	2	St	2							13					
	14	30.088	37.5	30.082	41.3	41.3	30.8							.10		W 1/2	S.W. 1		2	St	10	St	2							14					
	15	30.204	43.6	30.080	44.7	43.7	34.6							.01		W 1/2	S.W. 1 1/2		2	St	6	St	1							15					
	16	30.070	46.9	30.170	45.2	46.1	35.2							.02		S.W. 0	S.W. 1		10	St	10	St	1							16					
	17	29.820	52.0	30.004	48.8	53.2	39.1							—		S.W. 1 1/2	S.W. 0		10	St	10	St	1							17					
	18	29.582	51.4	30.004	42.3	51.1	44.0							.09		S. 1	N.W. 1		10	St	—	—	—							18					
	19	29.732	48.6	29.436	46.0	49.2	39.7							.06		S.W. 2	S. 1 1/2		4	St	10	St	—							19					
	20	29.430	45.4	29.244	39.8	38.4	35.7							—		S.W. 1 1/2	W 1		10	St	10	St	1							20					
	21	29.328	38.0	29.510	41.0	38.1	29.1							—		S.W. 1/2	W 1		4	St	1	St	1/2							21					
	22	29.432	44.3	29.460	44.7	41.2	27.6							.39		S.W. 1/2	S.W. 0		10	N.W.	10	St	—							22					
	23	29.732	43.8	29.634	44.6	42.0	35.3							.12		S. 1/2	S. 1		5	St	10	St	1/2							23					
	24	29.414	47.2	29.746	45.4	46.2	34.3							.46		S. 1	W 1/2		10	N.W.	5	St	—							24					
	25	30.140	42.5	30.154	46.4	44.2	35.1							—		S.W. 1	S. 1 1/2		5	St	10	St	1							25					
	26	30.266	47.1	30.378	46.8	48.2	34.3							—		S.W. 1	S.W. 1		10	St	10	St	1							26					
	27	30.440	47.2	30.432	44.4	45.2	41.8							—		S.W. 1	S. 1 1/2		10	St	10	St	—							27					
	28	30.210	42.5	30.164	45.6	39.3	28.1							—		S. 1 1/2	S.W. 1/2		10	St	10	St	—							28					
	29	30.140	39.0	30.254	43.0	36.2	27.3							—		S.W. 1/2	S.W. 0		8	St	10	St	—							29					
	30	30.228	43.2	30.008	44.2	40.2	29.3							.06		S. 1/2	S.W. 1/2		10	St	10	St	—							30					
	31	29.502	46.2	29.836	46.8	48.2	29.4							—		S.W. 2	S.W. 1		10	St	8	St	—							31					
	Sums.	1397 17 1/2		1134 15 1/2		127 17 1/2								6	229	26 1/2	25 1/2		236	232	25														
	Means.	29.909 45.0		29.926 44.5		43.2 33.8										0.85	0.82		7.6	7.5															
	+ Total Corrections for Instru- mental Errors.	-0.006 -7		-0.006 -7												0.6	0.6		7.6																
	+ Correc- tions for Diurnal Range.																																		
	"Cor- rected Means."																																		
	No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				

NOTATION USED IN GENERAL REMARKS.					
a.	denotes aurora.	m.	denotes meteor.		
ci.	cirrus.	ms.	meteors.		
ci-st.	cirro-cumulus.	n.	nimbus.		
ci-s.	cirro-stratus.	r.	rain.		
cu.	cumulus.	h. r.	heavy rain.		
cu-s.	cumulo-stratus.	c. h. r.	continued heavy rain.		
d.	dew.	s.	stratus.		
f.	fog.	sc.	scud.		
fr.	frost.	s.	sleet.		
h-fr.	hoar-frost.	s.	snow.		
h.	haze.	so. ha.	solar halo.		
h. d.	heavy dew.	sq.	squall.		
hl.	hail.	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), 29.872
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), 29.891
 Mean at Station, corrected, and at 32°, 29.882
 Correction for height, feet above Mean Sea-level, 0.74
 Mean, reduced to 32°, and Sea-level, 29.956
 Highest Reading, corrected for Index error, on the 5th, 30.624
 Lowest Do. Do., on the 10th, 28.820
 Difference, or Monthly Range, 1.804

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 17th, 55.2
 Lowest in Month, corrected for Index errors, on the 13th, 24.2
 Difference, or Monthly Range, 31.0
 "Corrected Mean" of all the Highest, (Col. 5), 43.2
 "Corrected Mean" of all the Lowest, (Col. 6), 33.8
 Difference, or Mean Daily Range, 9.4
 * Calculated Mean Temperature of Month, 38.5
 S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 17th, 55.2
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, 55.2
 Lowest at Night, Black Bulb (corrected for Index errors), on the 13th, 24.2
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, 24.2
 Difference of above means or range ("exposed"), 31.0

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), 55.2
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), 43.2
 * Computed Temperature of Dew-Point, 43.2
 * Do. Elastic Force of Vapour, 33.8
 * Do. Weight of Vapour in a Cubic Foot of Air, 9.4
 * Relative Humidity (Saturation = 100), 38.5
 RAIN fell on 16 Days; Amount in Inches, 2.29

WIND.		SUMMARY.	
Direction.	Force.	Mean Force.	Mean Velocity in miles per day.
A.M.	1	6	16.5
P.M.	2	6	15.7
Mean.	2	6	16.1

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

(Signed) Great Daily Run
= 18.9 on the 13th

