

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Glen Tana Aboyne*, County of *Aberdeen*, in Lat. _____, Long. _____, Distance from Sea *35* miles.

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

During the MONTH of *January* 189*2*

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. <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.		9 A.M.		P.M.		9 h. A.M.		9 h. P.M.															
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sunrays No.	Min. on Grass No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No. of hours in which it fell.	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.	SUNSHINE.					No. 1.	No. 2.	No. 3.	Temperature of Well at depth of feet, No.	Temperature at 1 fathom, and Density.	9 A.M.	9 P.M.			
		* No.	Inches.	No.	Inches.	No.	No.	No.	No.	No.	No.	No.	No.		No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
		No.	Inches.	No.	Inches.	No.	No.	No.	No.	No.	No.	No.	No.		No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.					No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
	1	29.65	46	29.85	45	40	23			35	33	41	40		N	4	NW	2		10		3											1							
	2	29.7	47	29.5	44	41	26			40	39	35	33		H	3	H	4		8E	6	10											2							
	3	29.62	40	29.79	40	44	18			33	32	30	29		H	2	NH	3		10		10												3						
	4	29.94	42	29.74	42	45	20			31	30	40	38		NH	3	H	2				10												4						
	5	29.25	45	29.61	45	46	20			43	42	35	33		N	2	N	4				10												5						
	6	28.95	43	29.19	40	43	15			33	32	30	29	0.45	N	4	N	2				10												6						
	7	29.1	39	29.11	41	35	18			23	21	29	27	0.45	N	2	N	3		10		10												7						
	8	29.19	42	29.89	44	34	14			32	31	33	31	0.55	NE	1	N	2		10		10												8						
	9	29.43	41	29.43	42	34	12			27	26	30	29	0.70	N	1	N	3		10		10												9						
	10	29.76	41	29.95	42	33	14			26	25	26	25	0.15	N	1	N	1		10		10												10						
	11	29.96	40	29.71	43	34	10			28	27	33	32		NW	1	H	2				10												11						
	12	29.81	42	29.81	40	40	11			32	31	26	24		N	1	N	1		10		10												12						
	13	29.64	39	29.31	43	38	15			23	22	35	34		S	1	S	1				10												13						
	14	29.26	41	29.25	44	38	13			34	33	27	25		S	1	SH	1		10		10												14						
	15	29.4	42	29.4	45	37	14			23	22	35	33	0.09	NH	2	NE	3		10		10												15						
	16	29.38	43	29.55	43	35	14			34	33	39	37		SE	3	S	3		10		10												16						
	17	29.7	42	29.73	43	35	22			57	35	38	36		SH	3	S	4		10		10												17						
	18	29.74	41	29.72	46	38	25			36	35	35	33	0.40	SH	1	S	2		10		10												18						
	19	29.78	45	29.81	47	39	27			37	36	37	35	0.30	H	1	S	1		10		10												19						
	20	29.78	45	29.8	46	37	23			34	33	32	30		S	1	S	1		10		10												20						
	21	29.7	44	29.89	47	36	13			35	33	34	33		S	2	H	2		10		10												21						
	22	29.54	44	29.59	46	38	23			35	32	29	27		H	1	H	1		10		10												22						
	23	29.7	45	29.51	47	40	18			27	26	39	37		H	1	H	2		NE	6	10												23						
	24	29.7	46	29.81	46	44	18			37	34	32	30		SH	1	H	1																24						
	25	30.1	44	30.19	46	40	27			37	34	39	37		H	1	H	2				10												25						
	26	29.95	48	29.87	48	46	30			45	41	43	40	0.43	NH	3	SH	2		10		10												26						
	27	29.49	50	29.51	51	51	25			45	48	40	37		SH	1	H	3		10		10												27						
	28	29.7	49	29.46	50	48	28			38	35	37	34		H	2	H	5		8E	8	10												28						
	29	29.37	52	29.48	53	54	27			52	51	43	41	0.10	H	5	H	5		10		10												29						
	30	29.53	53	29.62	50	58	29			43	40	41	39		H	4	H	3		NH	6													30						
	31	29.78	47	29.48	50	46	20			39	37	41	39		H	3	H	4		SH	3	10												31						
	Sums.	1867	128	1855	161	2560	8			142	92	157	111	332		62	75																							
	Means.	29.602	44.1	29.598	45.2	40.8	29.5			34.6	33.0	35.4	33.6			2.00	2.42																							
	+ Total Corrections for Instrumental Errors.																																							
	+ Corrections for Diurnal Range.																																							
	"Corrected Means."																																							
	No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30									

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

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = *29.561*
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = *29.554*
 Mean at Station, corrected, and at 32°, = *29.568*
 Correction for height, feet above Mean Sea-level, = _____
 Mean, reduced to 32°, and Sea-level, = _____
 Highest Reading, corrected for Index error, on the *25* th, = *30.190*
 Lowest Do. Do., on the *6* th, = *28.950*
 Difference, or Monthly Range, = *1.240*

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the *30* th, = *58.0*
 Lowest in Month, corrected for Index errors, on the _____ th, = _____
 Difference, or Monthly Range, = _____
 "Corrected Mean" of all the Highest, (Col. 5), = *40.8*
 "Corrected Mean" of all the Lowest, (Col. 6), = *27.5*
 Difference, or Mean Daily Range, = *13.3*
 * Calculated Mean Temperature of Month, = *34.2*
 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), = *35.0*
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = *33.3*
 Computed Temperature of Dew-Point, = *30.6*
 Do. Elastic Force of Vapour, = *.170*
 Do. Weight of Vapour in a Cubic Foot of Air, = _____
 Relative Humidity (Saturation = 100), = *83*
 RAIN fell on *10* Days; Amount in Inches, = *3.32*

WIND.												SUMMARY.			
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.				
A.M.	7	1		1	4	4	10	4		2.00					
P.M.	8	1			6	2	12	2		2.42					
Mean.	7	1.0	1	5	3	11	3	0		2.21					

(Signed) *Robert Warburton Glen Tana Aboyne*

Observations made and Return verified by _____

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Abayne, County of Aberdeen Shire, in Lat. _____, Long. _____, Distance from Sea 35 miles.
 Height of Cistern of the Barometer above Mean Sea-Level _____ feet, above Ground _____ feet.
 During the MONTH of February 1882.
 The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				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.			9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.			9 h. A.M.					As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Barometer. No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sun-rays No.	Min. on Grass. No.	Dry bulb. No.	Wet bulb. No.	Dry bulb. No.	Wet bulb. No.	No. of hours in which it fell. No.	Amount in inches. No.	Direction. No.	Force No.	Direction. No.	Force No.	Readings of the U. S. Cup Anemometer. No.	9 h. A.M. No.	Velocity (0-10), and Direction. No.	Amount (0-10), and Species. No.	Velocity (0-10), and Direction. No.	Amount (0-10), and Species. No.	Hours.	No. 3 inches.	No. 12 inches.	No. 22 inches.	Temperature of Well at depth of feet, No.		Temperature at 1 fathom, and Density.	0-10. No.	9 A.M.	9 P.M.	Mention the hour at which Storms, including Thunder and Lightning, began and ended.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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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.
fr.	frost.	s.	sleet.
h.-fr.	hoar-frost.	s.	snow.
h. d.	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), = 29.602
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.609
 Mean at Station, corrected, and at 32°, = 29.605
 Correction for height, feet above Mean Sea-level, = _____
 Mean, reduced to 32°, and Sea-level, = 29.605
 Highest Reading, corrected for Index error, on the 13 th., = 30.440
 Lowest Do. Do., on the 1 th., = 28.610
 Difference, or Monthly Range, = 1.830

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 10 th., = 57.0
 Lowest in Month, corrected for Index errors, on the 1 th., = 2.0
 Difference, or Monthly Range, = 55.0
 "Corrected Mean" of all the Highest, (Col. 5), = 40.8
 "Corrected Mean" of all the Lowest, (Col. 6), = 28.6
 Difference, or Mean Daily Range, = 14.2
 ** Calculated Mean Temperature of Month, = 33.7
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 1 th., = _____
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = _____
 Lowest at Night, Black Bulb (corrected for Index errors), on the 1 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), = 33.8
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 31.8
 † Computed Temperature of Dew-Point, = 28.2
 † Do. Elastic Force of Vapour, = 1.54
 † Do. Weight of Vapour in a Cubic Foot of Air, = _____
 † Relative Humidity (Saturation = 100), = 80
 RAIN fell on 13 Days; Amount in Inches, = 3.86

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	8				2	1	2			1.38	
P.M.	7				4	1	1			1.45	
Mean.	7.5				3.5	1.5	1.5			1.42	

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

Observations made and
 Return verified by

(Signed) Robert Warburton

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Forest of Glen Tana, County of Aberdeen Shire*, in Lat. _____, Long. _____, Distance from Sea *35* miles.
Height of Cistern of the Barometer above Mean Sea-Level _____ feet, above Ground _____ feet. During the MONTH of *March* 189*2*.
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. <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.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.											
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No. of hours in which it fell.	Amount in inches.	Dir.	Force.	Dir.	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.	No. 3 inches.	No. 12 inches.	No. 22 inches.		
		* No.		No.		No.	No.	No.	No.						No.																					
		Inches.	"	Inches.	"	"	"	"	"	"	"	"	"		"	"	"	"	"	"	"	"	"	"	"	"					"	"	"	"	"	"
	1	30.10	42	30.17	46	38	19			32	30	37	35		E	1	H	1		10	10	2								1						
	2	30.27	44	30.29	45	36	22			31	30	33	31		H	1	H	1		10	10	3								2						
	3	30.22	44	30.25	46	35	20			30	28	30	28		S	1	H	1		10	10	3								3						
	4	30.32	44	30.25	36	37	18			28	27	29	27		H	1	H	1		10	10	5								4						
	5	30.25	34	30.18	46	41	0.5			25	23	29	27		H	1	H	1		10	10	6								5						
	6	30.10	42	30.0	44	42	15			42	40	35	33		S	1	H	1		10	10	4								6						
	7	29.95	42	29.83	43	40	13			28	27	32	30		H	1	H	2		10	10	3								7						
	8	29.76	41	29.66	46	36	18			30	29	29	27		H	1	N	2		NE 9	10	5								8						
	9	29.38	43	29.19	40	41	13			24	23	27	25	0.32	NH	3	N	2		10	10	6								9						
	10	29.82	38	29.61	43	31	0.5			25	24	33	31	0.15	N	1	N	1		NE 9	10	2								10						
	11	29.61	41	29.69	46	35	17			32	31	30	28	0.70	N	1	N	1		10	10	4								11						
	12	29.61	44	29.45	42	39	14			26	24	35	33	0.30	N	1	N	1		NE 6	10	5								12						
	13	29.39	45	29.31	43	34	16			33	32	30	28	0.15	N	1	N	1		10	10	2								13						
	14	29.31	42	29.41	44	35	20			29	26	27	25	0.8	N	1	N	1		6	0	4								14						
	15	29.38	40	29.38	40	36	0.3			18	15	27	25		H	1	H	1		—	—	8								15						
	16	29.66	37	29.63	42	41	0.1			17	15	41	39		H	1	S	2		—	10	5								16						
	17	29.61	44	29.81	48	46	0.6			44	42	43	41		S	3	S	3		10	10	4								17						
	18	30.0	50	30.11	50	52	3.4			48	46	42	39		H	1	H	1		10	10	6								18						
	19	30.29	52	30.30	45	54	3.0			44	42	43	41		N	1	H	1		8E 9	10	5								19						
	20	30.28	44	30.19	46	48	2.0			48	46	43	41		H	1	H	1		10	8W 8	8								20						
	21	30.17	40	30.22	47	45	2.0			28	26	39	37		H	1	H	1		10	10	2								21						
	22	30.42	46	30.39	49	47	2.2			37	35	41	39		H	2	NH	1		—	10	5								22						
	23	30.39	47	30.23	44	47	2.8			44	42	39	37		NH	2	H	1		10	—	7								23						
	24	30.14	41	29.92	46	50	1.9			32	31	39	37		H	1	H	1		NE 4	—	6								24						
	25	29.83	42	29.54	47	55	1.9			32	31	39	37		H	1	NH	2		E 2	10	8								25						
	26	29.50	46	29.69	40	34	1.9			30	27	40	37	0.12	NH	1	N	1		10	10	3								26						
	27	29.9	36	29.89	37	40	0.6			38	35	29	27		N	2	NH	1		10	10	2								27						
	28	29.85	34	30.08	35	31	0.5			28	26	27	25		H	2	H	2		NE 4	10	1								28						
	29	30.33	33	30.29	42	32	0.7			30	27	25	23		H	1	H	1		—	10	8								29						
	30	30.37	39	30.28	40	46	1.0			20	18	43	41		H	1	H	2		SE 5	10	8								30						
	31	30.29	43	30.18	47	56	2.4			40	37	40	38		N	2	H	1		NE 8	10	6								31						
	Sums.	1287	58	2832	115	40	45.0			993	935	1076	1012	1.22		40		40																		
	Means.	29.935	41.6	29.913	43.7	41.3	4.2			320	302	347	326			1.29		1.29																		
	+ Total Corrections for Instrumental Errors.						13.6																													
	+ Corrections for Diurnal Range.																																			
	"Corrected Means."						21.6																													
	No. of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = *29.900*
"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = *29.873*
Mean at Station, corrected, and at 32', = *29.886*
Correction for height, feet above Mean Sea-level, = _____
Mean, reduced to 32', and Sea-level, = _____
Highest Reading, corrected for Index error, on the *22*th, = *30.420*
Lowest Do. Do., on the *9*th, = *29.190*
Difference, or Monthly Range, = *1.230*

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the *31*th, = *58.0*
Lowest in Month, corrected for Index errors, on the _____th, = *2.0*
Difference, or Monthly Range, = *56.0*
"Corrected Mean" of all the Highest, (Col. 5), = *41.3*
"Corrected Mean" of all the Lowest, (Col. 6), = *21.6*
Difference, or Mean Daily Range, = *19.7*
** Calculated Mean Temperature of Month, = *31.2*

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), = *33.3*
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = *31.4*
Computed Temperature of Dew-Point, = *27.8*
Do. Elastic Force of Vapour, = *.152*
Do. Weight of Vapour in a Cubic Foot of Air, = _____
Relative Humidity (Saturation = 100), = *80*
RAIN fell on *7* Days; Amount in Inches, = *1.82*

WIND.												SUMMARY.		
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.			
A.M.	8	1			3		16	3		1.29				
P.M.	8				2		18	3		1.29				
Mean.	8	0.1	0	0	2.0	0	17.3	0		1.29				

Observations made and
Return verified by

(Signed)

R. Harborton Glen Tana

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Glen Tana Aboyne*, County of *Aberdeenshire*, in Lat. _____, Long. _____, Distance from Sea *35* miles.

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

During the MONTH of *April* 189*2*.

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 Depth.	OZONE. 0-10.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, 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.		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. 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.	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.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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NOTATION USED IN GENERAL REMARKS.

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

TABLE FOR ESTIMATING FORCE OF WIND.

Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.	Estimated Force, 0-6.	Common Designation.
0	Calm	1	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), = *29.804*
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = *29.802*
 Mean at Station, corrected, and at 32', = *29.828*
 Correction for height, feet above Mean Sea-Level, = _____
 Mean, reduced to 32', and Sea-level, = _____
 Highest Reading, corrected for Index error, on the 2nd, = *30.280*
 Lowest Do. Do., on the 27th, = *29.500*
 Difference, or Monthly Range, = *0.780*

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 2nd, = *70.0*
 Lowest in Month, corrected for Index errors, on the 1st, = *15.0*
 Difference, or Monthly Range, = *55.0*
 "Corrected Mean" of all the Highest, (Col. 5), = *53.2*
 "Corrected Mean" of all the Lowest, (Col. 6), = *31.4*
 Difference, or Mean Daily Range, = *21.8*
 ** Calculated Mean Temperature of Month, = *42.3*

S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 2nd, = _____
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = _____
 Lowest at Night, Black Bulb (corrected for Index errors), on the 2nd, = _____
 "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), = *39.4*
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = *37.0*
 * Computed Temperature of Dew-Point, = *33.9*
 * Do. Elastic Force of Vapour, = *195*
 * Do. Weight of Vapour in a Cubic Foot of Air, = _____
 * Relative Humidity (Saturation 100), = *81*
 RAIN fell on 5 Days; Amount in Inches, = *0.79*

WIND.		SUMMARY.			
Direction.		N	NE	E	SE
A.M.		8	3	1	1
P.M.		10		19	1
Mean.		9	2	0	0

(Signed) *Robertson Glen Tana Aboyne*

Observations made and Return verified by

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

One of the chief objects that the SCOTTISH METEOROLOGICAL SOCIETY proposed to itself when the Society was established in 1855, was to secure PERFECT UNIFORMITY in the system of observation to be adopted at all its Stations. Uniformity in the system of observation is absolutely necessary to justify the publication of Monthly Results from different observations, it being found undesirable as to render them quite incomparable, may arise from dissimilarity in the position or situation of the instruments, or from the use of differently constructed instruments. It is therefore hoped, that the Society will be enabled to furnish Reports to the Society, by a Monthly Returns an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, an entire comparableness among the several Returns, without which the Society's Reports must inevitably fall in 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 time of day is not known. 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.

Barometer.—The barometer should be fitted for scientific purposes. No barometer should be used for Meteorological Observation that is not supplied with some means of adjustment or compensation which will secure that the height of the mercury in the tube is accurately measured from the fluctuating surface of the mercury in the cistern. The barometer in which the cistern is entirely got rid of, as in the case 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 of London. The barometer originally constructed by Mr. Ramsden of London, and usually called the Board of Trade barometer, has the great convenience of requiring no adjustment of the zero point, as the index is not true, but so much shorter than the true zero, as to compensate the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This is an excellent barometer for ordinary observations, as it is so easily adjusted, that the error of observation is likely to be in not a few cases in setting the instrument to the zero point of the fixed scale when the light is not good. To give the accuracy with which these Barometers are made, it may be stated, that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, with the result that none of the readings differed from those of the Standard more than 0.003 inch.

A modification of Fortin's Barometer is used at a number of the Society's Stations, by which the coincidence of the zero point with the surface of the mercury is indicated by a little ivory float, whose stem passes freely through the lid and 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 index 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. The object must not be hung against a wall heated by a fire. The object being secured, the whole instrument, including the piston-rod, shall be then read, contained mercury, and the attached thermometer shall be then read, at one uniform temperature, it is evident that the best position in which is least liable to sudden changes of temperature.

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

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

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must first be screwed so as to form a tight plug to the cistern, thus preventing the escape of the mercury. Then screw up the mercury not quite to the top of the tube, but to within a quarter of an inch of it, and take down the instrument; it should then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case if, on inclining the instrument, a sharp tap is produced when the mercury strikes the top of the tube. A full tap is heard, if 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, they are to be examined by the introduction of a Peg-tight, so that the air may be expelled. First close up the cistern by screwing the ivory peg tight, so that half an inch of the top of the tube, and having slightly inverted the instrument, place the finger on the palm of the hand, so as to induce the air to ascend through the column to the cistern, whence it may escape. Since there is the weight of two atmospheres—the pressure of the mercury in the Barometer, and the air outside—pressing on any air that may be inside the tube, it is usually a tedious operation to get it wholly expelled. After repeated trials, however, it is generally accomplished, and the clear metallic sound of the mercury, when gently struck against the top of the glass tube, will show when the whole of the air has been expelled. On hanging up the Barometer, care must be taken to screw down the mercury in the tube before unscrewing the float of the cistern, for, if this be not attended to, the mercury will flow out, and the instrument be seriously damaged.

OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

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 Philby'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 direction especially when the wind is stationary, and when the wind is blowing, the direction should be taken. In all cases, the wind-vane should be so placed, that the direction of the wind is well exposed to the changes in the direction of the wind; and during storms, exposures should be made 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, 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 Edinburgh, are recommended as likely to secure uniformity in making observations on the Force of the Wind. Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobstructed situation for observation, and partly from the defective nature of the instruments used. The Rain Gauge should not be placed on a slope or terrace, but on a level piece of ground, in as open a situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from streets, 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 the exposure are in the order of their importance, S.W., N.E., S.E., and N.W. The rim of the gauge must be perfectly level, and so that it will ground over grass, or a smooth surface. If things are furnished with 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. Show-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow shower occurs, it should be noted in the 'Remarks,' and the letter S affixed to the depth of water received in Gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the Rain Gauge. For wind, rain, and snow, as indicated in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Cloud ought to be estimated from the greater or less 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 Cloud is entered from a scale of 0 to 10; thus, when the sky over-head is free from Clouds it is entered 0, when half-covered by Clouds, 5, wholly covered 10, and so on. At 9 A.M. and at sunset, as illustrating the conditions of the sky, the upper and lower regions of the atmosphere. The time 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 an extreme velocity from S.W. and those in the lower regions from W., with one-third the speed of the former. Again, in the second Cloud column, an entry of 2, east, will indicate that the higher regions are covered to the amount of 4-tenths with stratus Clouds; and that the sky is further obscured to the extent of 2-tenths by lower Clouds of the cumulo stratus kind.

Remarks on peculiar Clouds, accompanied with drawings, will assist materially in the development of a more exact nomenclature of Clouds, as well as throw light on the electrical, and other of the more obscure phenomena of Meteorology. The approximate number of Hours in which objects in the sun's rays cast shadows, should be entered in the proper sunshine column. As the germination and growth of crops and plants generally depend greatly on the temperature of the soil,—its amount and constancy,—the Council recommend that Observations in this interesting department be made at 9 A.M., by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 3, 12, and 22 inches, and the stems 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 climate, a matter of importance. The Council 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 rivers, water, and as little as possible, be influenced by currents sweeping along the coast, and thus acquiring the temperature of the land, and, other greatly heated by the sun or cooled by frost.

At or near the time of high water, in cases where the observations cannot be taken daily, the observation may be made on the 5th, 15th, and 25th of each month. When convenient, extra Sea Observations might be taken for other hours and greater depths, noting always the Temperature of the Air, and the Hour of Observation. It is also very desirable that observations on the daily Maxima and Minima by Thermometers continuously immersed, be instituted at points along the coast, by the method proposed by Mr. T. Stevenson, and already commenced at Peterhead and Liverpool. The Temperature of the water at the bottom of the wells ought, when practicable, to be taken, both the depth of the water, and the nature of the bottom. The temperature of the water at the bottom of the wells ought, when practicable, to be taken, both the depth of the water, and the nature of the bottom. The temperature of the water at the bottom of the wells ought, when practicable, to be taken, both the depth of the water, and the nature of the bottom.

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(By Order) A. B.

EDINBURGH, December 1888.

FOREST TREES.		CROPS.		MIGRATORY BIRDS.		FRUITS.		SHRUBS, ETC.	
In flower.	In leaf.	Diseased of leaves.	Planted or sown in variety.	Barley, Oats, Beans, Peas, Potatoes, Turnips, Rye Grass, &c.	First Appearance.	First in Blossom.	First in Blossom.	First in Blossom.	First in Blossom.
Alder,	Beech,	Birch,	Elm,	Larch,	Limet,	Oak,	Sycamore or Plane,	Barberry,	Broom,
Black Currant,	Cherry,	House-Swallow,	Lapwing,	Plover,	Sand-Martin,	Starling,	Swan,	Mezereum,	Mountain Ash or Rowan,
Red Flowering Currant,	Rhododendron Ponticum,	Whin,	Apple,	Black Currant,	Cherry,	House-Swallow,	Lapwing,	Plover,	Sand-Martin,
Strawberry,	Peach,	Laburnum,	Lilac,	Mezereum,	Mountain Ash or Rowan,	Red Flowering Currant,	Rhododendron Ponticum,	Whin,	Apple,

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.



To the SECRETARY

122 George Street,

EDINBURGH.

BOOK POST.

EDINBURGH
MAY 25 1892

Glenn Tana
April 1892

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Alapra, County of Aberdeenshire, in Lat. _____, Long. _____, Distance from Sea 35 miles.

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

During the MONTH of May 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.			9 h. A.M.		9 h. P.M.		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.		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.							
		* No.	°	No.	°	No.	No.	No.	No.	°	°	°	°		No. of hours in which it fell.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.						
		inches.	°	inches.	°	°	°	°	°	°	°	°	°		°	°	°	°	°	°	°	°	°	°	°	°						
	1	29.81	50	29.74	49	56	38			39	37	35	33		H	1	H	1												1		
	2	29.90	46	30.04	49	61	18			38	35	42	38		H	1	N	2												2		
	3	30.03	47	29.98	48	58	28			40	36	39	37		N	2	N	2												3		
	4	30.0	46	29.96	50	48	29			38	35	40	38		N	2	N	2													4	
	5	29.98	49	30.02	45	46	30			42	38	37	35		N	2	N	1													5	
	6	30.13	48	30.09	50	49	29			39	34	45	43		N	1	H	1													6	
	7	29.88	46	29.91	44	58	18			49	47	45	43		N	1	N	1														7
	8	29.93	47	29.91	50	60	17			40	37	39	36		N	2	N	1														8
	9	29.96	52	30.02	49	59	22			43	40	37	35		N	2	NH	2														9
	10	30.11	49	30.21	45	61	20			45	43	40	38		H	1	H	1														10
	11	30.28	60	30.29	48	63	21			46	44	41	39		S	2	S	2														11
	12	30.55	57	30.12	56	64	19			48	45	49	46		S	2	S	1														12
	13	30.03	57	29.80	60	61	37			52	50	50	48		S	3	SH	2														13
	14	29.70	58	29.69	54	60	35			49	46	50	47		H	2	H	1														14
	15	29.47	57	29.41	50	60	34			53	50	45	43		SH	3	H	2														15
	16	29.25	52	29.48	54	61	35			43	41	41	39		S	2	N	2														16
	17	29.71	52	29.91	46	57	32			43	41	41	39		N	3	N	2														17
	18	29.96	48	29.61	49	50	24			44	42	43	41		S	2	H	1														18
	19	29.65	50	29.61	47	51	33			47	45	48	46		H	2	H	1														19
	20	29.46	50	29.77	49	59	29			50	48	49	47		H	1	N	2														20
	21	29.74	50	29.82	48	52	21			45	43	41	39		H	2	N	2														21
	22	29.89	50	29.82	48	51	26			45	43	41	39		N	1	H	1														22
	23	29.68	46	29.65	34	50	25			43	40	50	48		NE	1	H	2														23
	24	29.52	51	29.68	49	60	34			53	50	49	46		SH	3	SH	1														24
	25	29.66	52	29.61	57	64	33			50	47	54	51		H	1	H	2														25
	26	29.75	60	29.78	58	56	30			55	51	52	50		N	1	H	2														26
	27	29.64	55	29.81	57	58	41			50	49	50	48		N	1	H	1														27
	28	29.87	55	29.77	49	61	31			48	46	45	43		SE	1	S	2														28
	29	29.41	50	29.60	52	60	35			46	43	57	48		H	4	H	3														29
	30	29.64	54	29.71	54	62	36			56	49	49	45		H	4	H	2														30
	31	29.75	57	29.58	59	63	46			58	53	58	48		SE	1	H	1														31
	Sums.	1813	33	1812	27	232	476			145	108	159	86		313	37	19															
	Means.	29.815	51.1	29.824	50.9	57.5	28.8			46.3	43.5	45.1	42.7		184	158																
	+ Total Corrections for Instrumental Errors.																															
	+ Corrections for Diurnal Range.																															
	+ "Corrected Means."																															
	No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

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

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction \ddagger for Temp. (Col. 2), = 29.755
"Corrected Mean" of Barometer at 9 P.M., minus the Correction \ddagger for Temp. (Col. 4), = 29.764
Mean at Station, corrected, and at 32', = 29.759
Correction for height, feet above Mean Sea-level, = _____
Mean, reduced to 32', and Sea-level, = _____
Highest Reading, corrected for Index error, on the 12 th., = 30.350
Lowest Do. Do., on the 16 th., = 29.258
Difference, or Monthly Range, = 1.100

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 28 th., = 66.0
Lowest in Month, corrected for Index errors, on the _____ th., = 25.0
Difference, or Monthly Range, = 31.0
"Corrected Mean" of all the Highest, (Col. 5), = 57.5
"Corrected Mean" of all the Lowest, (Col. 6), = 36.8
Difference, or Mean Daily Range, = 20.7
** Calculated Mean Temperature of Month, = 47.2
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), = 45.7
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 43.2
†† Computed Temperature of Dew-Point, = 40.3
†† Do. Elastic Force of Vapour, = 25.2
†† Do. Weight of Vapour in a Cubic Foot of Air, = _____
†† Relative Humidity (Saturation 100), = 82
RAIN fell on _____ Days; Amount in Inches, = 3.13

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.	10	1			2	5	2	1			1.84
P.M.	70				3	2	5	1			1.58
Mean.	10	1	0	1	4	2	13	0	0		1.71

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Observations made and
Return verified by

(Signed)

R. Warburton Glen Tana

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Glen Tana Aboyne* County of *Aberdeenshire*, in Lat. _____, Long. _____, Distance from Sea *35* miles.

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

During the MONTH of *June* 18*92*.

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. <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.		9 A.M.		P.M.		9 h. A.M.											
		No.	Barometer.	No.	Barometer.	No.	Barometer.	No.	Barometer.	No.	Barometer.	No.	Barometer.		No.	Barometer.	No.	Barometer.	No.	Barometer.	No.	Barometer.	No.	Barometer.	No.					Barometer.				
		inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.		inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.					inches.	inches.			
	1	29.42	46	29.49	58	70	43			58	51	52	49	0.10	S	3	H	1		NE	9	10	6									1		
	2	29.55	50	29.21	50	63	28			49	45	50	48	0.70	H	1	S	3		10	10	4									2			
	3	29.31	57	29.52	53	50	30			45	43	43	41		H	4	H	3		10	SH	6	7									3		
	4	29.68	54	29.61	54	59	34			49	44	50	46		H	3	H	2		10			4									4		
	5	29.64	53	29.80	50	55	35			47	45	43	39		S	2	H	1		NE	7	10	4									5		
	6	29.79	54	30.11	57	59	32			53	49	55	50		SE	1	N	1		NE	4		9									6		
	7	30.19	60	30.21	62	72	39			64	58	59	56		SE	1	S	1		NE	4		11									7		
	8	30.23	63	30.09	60	79	42			68	61	60	57		SH	2	H	1		SH	3		10									8		
	9	30.16	63	30.01	60	79	40			66	60	47	44		N	1	N	1				10	9									9		
	10	30.02	58	29.94	53	80	36			45	43	45	42		N	1	N	2		10	10	0										10		
	11	29.87	57	29.85	56	50	33			43	41	47	45	0.12	E	1	N	2		10	10	5										11		
	12	29.79	54	29.96	52	50	30			45	43	43	41		N	2	N	2		10	10	2										12		
	13	30.03	50	30.11	49	50	28			44	42	44	41		N	3	N	2		10	10	6										13		
	14	30.13	51	30.12	53	50	29			45	43	50	48		N	3	N	2		NE	8	10	5										14	
	15	29.94	54	29.72	53	56	37			49	47	49	47	0.20	N	1	H	1		10	10	4											15	
	16	29.89	55	29.88	52	54	36			48	46	50	48		N	1	H	2		10	10	5											16	
	17	29.83	50	29.84	53	50	31			49	46	51	49		N	1	N	1		10	10	2											17	
	18	29.83	53	29.81	56	55	35			47	45	45	43		N	1	S	1		10	10	4											18	
	19	29.48	54	29.81	53	57	38			50	47	48	46		S	1	N	1		10	10	—											19	
	20	30.01	53	30.09	48	53	38			47	45	43	40	0.32	N	2	NE	1		10	10	9											20	
	21	30.09	57	30.01	56	59	25			48	46	53	53	0.9	NE	1	N	1		10	10	8											21	
	22	29.79	52	29.66	55	62	30			46	44	44	42	0.7	H	1	N	2		10	10	1											22	
	23	29.63	57	29.63	53	51	33			48	46	47	45		NE	1	N	1		10	10	—											23	
	24	29.79	57	29.82	53	56	34			45	44	49	47		N	1	S	2		10	10	4											24	
	25	29.85	53	29.58	56	60	35			48	46	52	49	0.12	SE	1	S	2		10	10	2											25	
	26	29.60	58	29.55	64	60	37			55	53	60	57	0.5	SE	1	S	2		10	10	3											26	
	27	29.50	62	29.49	58	68	46			59	53	45	41	0.5	H	2	H	1		10	—	10											27	
	28	29.99	60	30.10	55	65	34			55	48	53	50		H	4	H	5		10	—	10											28	
	29	30.28	57	30.01	53	68	32			55	58	53	51		H	1	S	2		SH	4	10	8										29	
	30	30.03	58	29.94	54	66	27			58	58	54	52		S	2	H	1		10	10	9											30	
	31																																	31
	Sums.	2589	144	2547	150	08	126			28	235	286	207	1.82		50	48																	
	Means.	29.84	55.48	29.84	55.06	3.34	2			57.9	47.8	49.5	46.9			167	160																	
	+ Total Corrections for Instrumental Errors.						780																											
	+ 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.
cl-s.	cirro-stratus.	r.	rain.
cu.	cumulus.	h. r.	heavy rain.
cu-s.	cumulo-stratus.	c. h. r.	continued heavy rain.
d.	dew.	s.	stratus.
f.	fog.	sc.	scud.
fr.	frost.	s.	sleet.
h.-fr.	hoar-frost.	s.	snow.
h.	haze.	so. ha.	solar halo.
h. d.	heavy dew.	sq.	squall.
hl.	hail.	sqs.	squalls.
l.	lightning.	t.	thunder.
l. sh.	light showers.	t. s.	thunder-storm.
lu. co.	lunar corona.	w.	wind.
lu. ha.	lunar halo.	g.	gale of wind.

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 2), = *29.776*

"Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{1}{100}$ for Temp. (Col. 4), = *29.778*

Mean at Station, corrected, and at 32°, = *29.777*

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

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

Highest Reading, corrected for Index error, on the 8 th., = *30.230*

Lowest Do. Do., on the 2 th., = *29.210*

Difference, or Monthly Range, = *1.020*

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 10 th., = *80.0*

Lowest in Month, corrected for Index errors, on the 21 th., = *33.0*

Difference, or Monthly Range, = *47.0*

"Corrected Mean" of all the Highest, (Col. 5), = *60.3*

"Corrected Mean" of all the Lowest, (Col. 6), = *42.2*

Difference, or Mean Daily Range, = *18.1*

* Calculated Mean Temperature of Month, = *51.2*

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

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

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

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

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

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = *50.2*

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = *47.4*

Computed Temperature of Dew-Point, = *44.4*

Do. Elastic Force of Vapour, = *293*

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

Relative Humidity (Saturation - 100), = *81*

RAIN fell on 10 Days; Amount in Inches, = *1.82*

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		11	2	1	4	1	7				1.67
P.M.		12	1		8		10				1.60
Mean.		11	2	1	2	3	7	8	0	0	1.64

Observations made and
Return verified by _____

(Signed) *R. Harburton Glen Tana*

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Aboyné, County of Aberdeenshire, in Lat. _____, Long. _____, Distance from Sea 35 miles.

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

During the MONTH of July 1892

The Hours of Observation are of Greenwich Time.

BAROMETER, "corrected Mean" at 9 A.M., <i>minus</i> the Correction $\frac{11}{16}$ for Temp. (Col. 2), =	29.872	7.5	29.797
"Corrected Mean" of Barometer at 9 P.M., <i>minus</i> the Correction $\frac{11}{16}$ for Temp. (Col. 4), =	29.864	7.4	29.790
Mean at Station, corrected, and at 32°,			29.793
Correction for height, feet above Mean Sea-level,			
Mean, reduced to 32°, and Sea-level,			
Highest Reading, corrected for Index error, on the 27 th ,			30.250
Lowest Do. Do., on the 7 th ,			28.490
Difference, or Monthly Range,			1.260

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 31 st th,	=	76.0
Lowest in Month, corrected for Index errors, on the 21 st th,	=	33.0
Difference, or Monthly Range,	=	43.0
"Corrected Mean" of all the Highest, (Col. 5),	=	62.1
"Corrected Mean" of all the Lowest, (Col. 6),	=	43.2
Difference, or Mean Daily Range,	=	18.9
** Calculated Mean Temperature of Month,	=	52.6

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

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

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

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

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

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), - 57.3

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), 48.3

Computed Temperature of Dew-Point,	45.2
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** Do. Elastic Force of Vapour,	303
---------------------------------------	-----

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

Relative Humidity (Saturation = 100). = 80

RAIN fell on 10 Days; Amount in Inches,

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	9	3	1	1	1	3	9	4		132	
P.M.	10	2	1		3	1	14			129	
Mean.	9	3	1	1	2	2	11	2	1	130	

Observations made and
Return verified by

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Abnys, County of Aberdeen-shire, in Lat. _____, Long. _____, Distance from Sea 35 miles.

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

During the MONTH of August 1892.

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. Hours.	9 h. A.M.			Temperature of Well at depth of feet, No. _____	Temperature at 1 fathom, and Density.	0-10.			As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. No.	Min. 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.	9 P.M.		
		* No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.	_____	No.		_____
		inches.	_____	inches.	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____		_____
	1	29.85	61	30.01	54	70	44			54	52	46	42			N	1	N	2		10	10	—									1		
	2	30.04	56	29.91	61	66	39			48	46	50	48			NE	1	N	1		10	10	3									2		
	3	29.87	59	29.88	58	64	40			55	52	50	47			NW	2	N	2	NW	9	10	6									3		
	4	29.90	55	29.90	58	60	35			48	45	53	50			N	3	S	2		10	10	8									4		
	5	29.75	56	29.58	60	59	35			56	51	57	54			SH	1	H	2		10	10	5									5		
	6	29.48	58	29.61	59	66	44			57	54	49	47			H	3	H	1		10	10	8									6		
	7	29.75	60	29.85	58	62	47			55	52	54	50			H	1	SH	1	SH	7	10	6									7		
	8	29.81	56	29.85	55	60	39			48	45	49	46	0.20		N	1	N	1		10	10	1									8		
	9	29.95	53	30.04	49	51	36			47	43	53	51			N	2	N	1		10	—	5									9		
	10	30.08	51	29.98	59	57	24			53	47	55	53			NW	1	NW	2	NE	4	10	10									10		
	11	29.88	57	29.81	56	70	41			52	50	53	50			H	1	H	1		10	10	5									11		
	12	29.84	60	29.60	60	68	39			57	54	57	54			S	1	S	2	SE	6	10	8									12		
	13	29.86	62	29.25	60	68	49			60	57	57	54			S	3	S	1		10	10	7									13		
	14	29.33	61	29.34	60	68	45			60	55	56	52			S	3	S	2		10	10	9									14		
	15	29.36	59	29.62	48	67	43			54	52	52	48			H	3	S	1		10	10	7									15		
	16	29.79	50	29.82	60	65	43			54	52	52	50			S	1	S	2		10	10	8									16		
	17	29.81	59	29.09	59	66	40			50	48	49	47	0.16		N	1	S	1		10	10	5									17		
	18	29.88	58	29.71	54	64	40			52	50	48	46	0.42		SE	2	S	2		10	10	—									18		
	19	29.61	56	29.75	52	53	39			51	49	50	48			NW	1	S	2		10	10	3									19		
	20	29.81	54	29.82	60	62	28			50	46	60	58			SE	1	S	2		—	10	7									20		
	21	29.78	62	29.88	67	64	42			63	62	60	58			S	3	S	2		10	10	15									21		
	22	29.88	64	29.80	63	70	54			62	60	59	57			S	1	S	1		10	10	5									22		
	23	29.75	61	29.68	63	73	45			54	53	60	58			S	1	SH	1		10	10	10									23		
	24	29.65	60	29.54	59	65	37			59	57	57	54			S	2	H	1		10	10	3									24		
	25	29.58	58	29.60	54	67	40			55	53	50	47			N	1	NW	2		10	10	4									25		
	26	29.64	56	29.41	58	65	39			55	52	55	53			H	1	SH	2	SE	9	10	6									26		
	27	29.35	56	29.25	48	63	36			52	50	41	38			S	2	S	1		10	—	9									27		
	28	29.29	50	29.48	46	58	30			49	45	40	37			SH	2	H	1		10	—	7									28		
	29	29.65	49	29.61	56	58	34			47	41	53	51			NE	1	N	1		—	10	7									29		
	30	29.39	54	29.23	57	59	38			50	48	50	47	1.15		NE	2	N	2		10	10	—									30		
	31	29.21	58	29.40	56	62	40			52	51	57	52	0.63		N	2	S	1		10	10	1									31		
Sums.		2132	219	2111	217	102	295			109	21	71	300	2.76		51		46																
Means.		29.688	57.1	29.681	57.0	63.3	39.2			53.5	50.7	57.3	49.7			1.64		1.48																
+ Total Corrections for Instrumental Errors.																																		
+ Corrections for Diurnal Range.																																		
+ "Corrected Means."																																		
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			

NOTATION USED IN GENERAL REMARKS.					
a.	denotes aurora.	m.	denotes meteor.		
ci.	" cirrus.	ms.	" meteors.		
ci-cn.	" cirro-cumulus.	ll.	" 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), = 29.688 75 29.613
"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.681 75 29.606
Mean at Station, corrected, and at 32', = 29.609
Correction for height, feet above Mean Sea-level, = _____
Mean, reduced to 32', and Sea-level, = _____
Highest Reading, corrected for Index error, on the 10 th, = 30.080
Lowest Do. Do., on the 31 th, = 29.210
Difference, or Monthly Range, = 0.870

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

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 23 th, = 73.0
Lowest in Month, corrected for Index errors, on the 10 th, = 32.0
Difference, or Monthly Range, = 41.0
"Corrected Mean" of all the Highest, (Col. 5), = 63.3
"Corrected Mean" of all the Lowest, (Col. 6), = 47.2
Difference, or Mean Daily Range, = 16.1
** Calculated Mean Temperature of Month, = 55.2

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

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 52.9
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 50.2
Computed Temperature of Dew-Point, = 47.5
Do. Elastic Force of Vapour, = 3.28
Do. Weight of Vapour in a Cubic Foot of Air, = _____
Relative Humidity (Saturation = 100), = 82
RAIN fell on 5 Days; Amount in Inches, = 2.76

WIND.		SUMMARY.					
Direction.	N	NE	E	SE	S	SW	W
A.M.	63	29	28	3			
P.M.	7		14	3	5	2	
Mean.	62.0	1.1	3	5.3	0		

2.43

Observations made and
Return verified by

(Signed)

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Abayne County of Aberdeen-shire, in Lat. _____, Long. _____, Distance from Sea 35 miles.

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

During the MONTH of September 1892.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.				
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.			9 h. A.M.		9 h. P.M.		9 A.M.		P.M.			9 h. A.M.										
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	Max.	Min.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No. of hours in which it fell.	No.	Direction.	Force.	Direction.	Force.	Readings of the H. Cup Anemometer.	Velocity (0-6).		Amount (0-10), and Direction.	Velocity (0-6).	Amount (0-10), and Direction.					No.	No.	No.	
		No.		No.		No.	No.	No.	No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.								No. 9 h. A.M.											3 inches.	12 inches.	22 inches.
		inches.	"	inches.	"	"	"	"	"	"	"	"	"		"																			
	1	29.44	53	29.37	52	54	35			42	47	43	40		S	1	NW	1			10			7						1				
	2	29.28	51	29.23	53	62	28			44	40	45	43	0.05	H	1	N	1		SE	4			5						2				
	3	29.32	51	29.67	49	57	33			46	44	41	38		NW	1	W	2			10		10	3						3				
	4	29.82	48	30.68	50	54	26			39	37	40	37		N	1	N	1						5						4				
	5	30.08	46	29.83	55	52	23			38	35	53	50		SE	1	H	2			10		10	4						5				
	6	30.00	57	29.96	52	58	31			57	54	50	47		H	1	1	1			10			8						6				
	7	29.80	54	29.81	54	67	32			54	50	43	40		S	1	H	1		NW	9			4						7				
	8	29.45	52	29.29	51	60	30			37	35	55	43		H	1	H	1						10						8				
	9	29.80	50	29.72	52	64	28			51	48	55	53		H	1	H	1						8						9				
	10	29.72	54	29.61	50	60	30			54	51	50	47		H	2	H	1					10	9						10				
	11	29.75	52	29.69	54	61	40			50	47	47	45		NW	1	H	2			10	SH	8	6						11				
	12	29.74	55	29.64	55	60	38			51	48	50	48	0.15	S	2	S	1					10	4						12				
	13	29.38	57	29.78	48	59	47			52	51	50	48	0.30	S	2	S	1			10		10	1						13				
	14	29.79	50	29.72	57	55	31			40	37	50	47		H	1	S	2			10		10	3						14				
	15	29.65	55	29.59	59	57	37			52	51	53	50		S	2	S	2			10		10	1						15				
	16	29.26	57	29.28	55	57	45			52	50	47	43		S	2	H	1			10		10	3						16				
	17	29.85	52	29.84	58	58	35			44	41	55	58		H	2	H	2			10		10	2						17				
	18	29.67	56	29.59	57	55	41			53	52	48	46		S	2	S	1			10		10	4						18				
	19	29.52	59	29.86	52	63	39			50	47	45	43	0.10	H	2	H	2			10		10	6						19				
	20	30.05	50	30.11	50	64	36			48	44	37	34		H	1	S	1		NE	9			6						20				
	21	30.20	48	30.20	47	53	23			32	32	34	33		SE	1	N	1						8						21				
	22	30.26	43	30.19	50	59	25			32	30	41	39		SE	1	S	1					10	6						22				
	23	30.00	52	29.68	49	61	26			43	41	47	45		S	1	S	2			10		10	6						23				
	24	29.47	54	29.49	53	61	39			46	43	50	48		H	3	H	3		NE	8		10	5						24				
	25	29.45	54	29.66	53	55	41			51	49	43	40	0.25	H	2	S	3			10		10	6						25				
	26	29.63	54	29.31	60	57	35			48	46	43	42		S	2	S	4			10		10	3						26				
	27	29.09	58	29.12	54	58	42			45	44	44	42	0.30	S	2	H	2			10			2						27				
	28	29.58	50	29.36	50	57	36			42	40	40	37		H	3	S	2			10			6						28				
	29	29.15	51	29.20	48	57	37			35	33	34	33		SH	3	H	1		NE	9		10	4						29				
	30	29.25	45	29.29	52	52	25			31	29	40	39		H	9	S	2		SE	8		10	4						30				
	31																														31			
Sums.		1995	68	1989	79	239	58			165	98	173	83	1.15		47		48																
Means.		29.665	52.302	29.663	52.658	58.0	31.9			45.5	43.2	45.8	42.8			1.57		1.60																
+ Total Corrections for Instrumental Errors.																																		
+ Corrections for Diurnal Range.																																		
"Corrected Means."																																		
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			

NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	cirrus.	ms.	meteors.
ci-cu.	cirro-cumulus.	n.	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.	snow.
h.	haze.	s.	solar halo.
h. d.	heavy dew.	sq.	squall.
li.	hail.	sq.	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. h.	lunar halo.		

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = 29.592
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.599
 Mean at Station, corrected, and at 32°, = 29.590
 Correction for height, feet above Mean Sea-level, = _____
 Mean, reduced to 32°, and Sea-level, = _____
 Highest Reading, corrected for Index error, on the 22 th., = 30.260
 Lowest Do. Do., on the 27 th., = 29.090
 Difference, or Monthly Range, = 1.170

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 2 th., = 67.0
 Lowest in Month, corrected for Index errors, on the 5th. 21., = 37.2
 Difference, or Monthly Range, = 30.0
 "Corrected Mean" of all the Highest, (Col. 5), = 58.0
 "Corrected Mean" of all the Lowest, (Col. 6), = 39.9
 Difference, or Mean Daily Range, = 18.1
 ** Calculated Mean Temperature of Month, = 49.0
 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), = 45.6
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 43.0
 Computed Temperature of Dew-Point, = 40.0
 Do. Elastic Force of Vapour, = 24.8
 Do. Weight of Vapour in a Cubic Foot of Air, = _____
 Relative Humidity (Saturation - 100), = 82
 RAIN fell on 6 Days; Amount in Inches, = 1.15

WIND.		SUMMARY.			
Direction.		N	NE	E	SE
A.M.	1				3
P.M.	9				12
Mean.	20.02	11	7	13	1

Mean Force, 1.57
 Mean Velocity, 1.60
 Mean, 2.50

(Signed) R. Warburton Glen Tana

Observations made and
 Return verified by

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Abayna, County of Aberdeen, in Lat. _____, Long. _____, Distance from Sea 35 miles.

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

During the MONTH of October 1882.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				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 No.	9 A.M.		P.M.		SUNSHINE. Hours.	9 h. A.M.						Temperature of WELL at depth of feet, No.	Temperature at 1 fathoms, and Density.	9 A.M.	P.M.	
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. No.	Min. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.		Velocity (0-6) 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.
		* No.	inches.	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"					"	"	"	"	"
	1	29.35	51	29.36	51	54	25			34	38	45	44	0.80	SH	2	S	1		10	10	3										1				
	2	29.41	49	29.55	48	50	34			44	43	45	43	0.19	N	1	N	1		10	10	1										2				
	3	29.70	49	29.65	54	50	33			44	42	40	39	0.15	N	1	N	2		10	10	1										3				
	4	29.59	52	29.60	50	52	40			38	37	43	42	0.30	NE	1	N	2		10	10	1										4				
	5	29.35	51	28.99	50	51	40			44	43	46	44	0.95	N	2	S	3		10	10	—										5				
	6	29.55	55	29.15	53	48	36			45	45	40	39	0.05	S	3	W	2		10	10	—										6				
	7	29.10	51	29.19	53	53	37			41	39	42	40	0.15	NE	2	N	3		10	—	2										7				
	8	29.94	49	29.19	48	50	34			40	39	39	37	0.06	N	4	N	1		10	10	1										8				
	9	28.79	47	29.14	50	46	30			38	35	45	44	0.25	NW	1	N	3		10	10	—										9				
	10	29.45	45	29.71	51	48	35			42	41	42	41	0.07	N	4	N	2		10	10	5										10				
	11	29.90	53	30.02	49	49	33			44	43	39	38		N	3	N	1		10	10	3										11				
	12	30.09	47	30.11	50	45	32			40	37	40	39	0.08	NW	1	N	2		10	10	—										12				
	13	30.12	32	30.10	54	45	36			43	42	46	45	0.08	N	2	N	2		10	10	2										13				
	14	30.14	53	30.11	52	46	39			45	44	39	37		NE	1	N	1		10	10	5										14				
	15	30.06	51	30.01	49	51	36			41	39	39	38	0.02	N	1	N	3		10	10	2										15				
	16	29.92	46	29.93	48	50	34			38	37	36	35	0.05	N	2	NE	2		10	10	1										16				
	17	30.04	46	30.11	48	42	30			34	33	38	36	0.17	NE	1	N	1		10	10	2										17				
	18	Barometer under repair				39	29			35	34	42	41		N	2	W	2		10	10	4										18				
	19	Barometer under repair				44	32			40	39	40	39		H	2	H	2		SE	2	10	4									19				
	20	29.44	48	29.28	49	47	33			38	37	40	38		NW	1	N	1		10	10	6										20				
	21	29.61	47	29.64	46	45	30			37	36	35	34	0.25	N	1	N	2		10	10	1										21				
	22	29.61	47	29.44	45	40	29			34	33	37	35	0.12	NE	1	N	2		SE	9	10	3									22				
	23	29.42	45	29.51	46	40	34			40	37	39	37	0.40	N	1	N	3		10	10	—										23				
	24	29.67	44	29.89	43	39	29			33	32	28	27		N	1	N	1		10	—	4										24				
	25	29.80	41	29.80	40	38	20			33	31	34	32		H	1	N	1		E	3	—	3									25				
	26	29.87	41	29.71	49	47	26			36	34	34	32		H	2	SH	1		10	10	2										26				
	27	29.36	47	29.15	48	49	30			40	38	43	43	0.50	S	2	S	3		10	10	—										27				
	28	28.90	51	29. —	56	50	29			48	45	50	49	0.45	S	2	S	2		SE	8	110	1									28				
	29	28.95	54	29.09	50	58	44			49	48	41	40	0.04	S	2	S	3		10	—	2										29				
	30	29.39	47	29.49	48	53	28			39	37	37	35		S	2	H	1		S	4	—	6									30				
	31	29.57	46	29.61	44	51	24			35	33	35	34		H	1	H	1		SE	3	—	6									31				
Sums.		1654	4245	1658	262	230	74			307	261	109	267	5.03		53		57																		
Means.		29.50	48.5	29.57	49.0	47.4	32.4			39.9	38.4	40.0	38.6			1.71		1.84																		
* Total Corrections for Instrumental Errors.		536																																		
* 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					

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = 29.483
"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.518
Mean at Station, corrected, and at 32', = 29.500
Correction for height, feet above Mean Sea-level, = _____
Mean, reduced to 32', and Sea-level, = _____
Highest Reading, corrected for Index error, on the 14th, = 30.140
Lowest Do. Do., on the 28th, = 28.900
Difference, or Monthly Range, = 1.240

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 29th, = 58.0
Lowest in Month, corrected for Index errors, on the 20th, = 20.0
Difference, or Monthly Range, = 38.0
"Corrected Mean" of all the Highest, (Col. 5), = 47.4
"Corrected Mean" of all the Lowest, (Col. 6), = 32.4
Difference, or Mean Daily Range, = 15.0
** Calculated Mean Temperature of Month, = 39.9
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the _____th, = _____
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = _____
Lowest at Night, Black Bulb (corrected for Index errors), on the _____th, = _____
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = _____
Difference of above means or range ("exposed"), = _____

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 40.0
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 38.5
Computed Temperature of Dew-Point, = 36.6
Do. Elastic Force of Vapour, = 2.07
Do. Weight of Vapour in a Cubic Foot of Air, = _____
Relative Humidity (Saturation = 100), = 80
RAIN fell on 2 Days; Amount in Inches, = 5.03

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		13	5			5	1	4	3		1.71
P.M.		18	1			5	1	6			1.84
Mean.		15.3	0	0	0	5	1	5	2	0	1.78

(Signed) Robert WarburtonObservations made and
Return verified by

TAKING METEOROLOGICAL

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Hygrometers, be kept in Stevenson's Lortie-boarded Box for Thermometers, painted white inside and outside, and the Thermometers, painted white inside, firmly screwed to four stout posts, also painted white, firmly fixed in the ground. The posts must be of such a length that when the Thermometers are hung in position the Bulbs of the Minimum Thermometers; and of the Dry and Wet Bulb Thermometers, be exactly at the same height of FOUR FEET above ground. The Maximum Thermometer being hung immediately above the Minimum Thermometer. The Thermometer Box be placed over a plot of grass, and in a free open space to which the sun's rays have free access, during as much of the day as surrounding conditions enable the Observer to secure it. The four posts should be equal in length up to the north end of the Box, and if free the observer should open to the north. The Council regard the position of the THERMOMETER OF HEIGHT, the COUNCIL, and METHOD IN REGISTERING THE THERMOMETERS, OVER GROUND, AND METHOD IN REGISTERING THE THERMOMETERS, OVER GROUND, as a matter of great importance, and have decided that observations made at different Stations are incomparable, unless the Observer is able to compare the climates of places with other places, or to make such comparisons as will be of service to other observers, or to make such comparisons as will be of service to other observers, or to make such comparisons as will be of service to other observers.

such other as regards their most important features.

Professor Phillips, and Negretti and Zambra's Maximum Thermometers, and Rutherford's Minimum Thermometer, these instruments are recommended. It is recommended that these thermometers be graduated on the glass stem. The thermometers be graduated on the glass stem. The thermometers be graduated on the glass stem.

Maximum thermometers are liable to two demerits—viz, the column of spirit breaking and part of the spirit disilling by high temperature and lodging at the top of the tube. This derangement of occasional occurrence with protected Thermometers. Hence a systematic occurrence with exposed Thermometers. Hence a systematic occurrence with exposed Thermometers.

For the examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

Fortunately spirit Thermometers may be easily set right by any one, when the column of spirit chances to separate. For 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 break and down the detached portion of spirit till it unites with the main column. A few turns, or swinging strokes, will greatly be

efficient for the purpose; after which the thermometer should be returned in a slanting position, to allow the rest of the spirit still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. Heat should be applied slowly and cautiously to the top of the tube where the detached portion of spirit is, until the heat is applied to the bulb, when it will condense on the surface of the unbroken column of spirit. If the heat be too high, the heat is not applied too quickly; or, if the heat be too low, the tube will break and the instrument be destroyed. The best one, to apply the requisite amount of heat is by bringing the end of the tube slowly down towards a minute flame, which is to be kept just at it, and, a piece of heated metal will be found to be the best.

The bulbs of the thermometers for registering the greatest heat from the sun, and the least from radiation turning around, should have a black coating which may easily be obtained by the sublimation mixture.

Black Bulbs.

It must, however, be added, that the use of the apparatus is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

The Hygrometer in use at the Society's Stations consists of two parts, the *Hygrometer* in the frame, but not necessarily mounted upon it, and the *Wet Bulb*, which may be attached or detached from the frame. As apparently slight deviations from the geometrical Observations. Observers are specially requested to attend to the following conditions.—The bulbs must hang down at least an inch free from the scales and frame to which they are attached; the frame must be such as will bring the tubes forward horizontally, so that the bulb may be suspended; the water-pan must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but in no case under the bulbs; the muslin must be of medium fineness, and fastened at the neck of the bulb by the cotton, which also supplies it with water. It must be seen to by the Observer that the muslin is always clean and moist, and that the water pan is full.

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 thus formed evaporation will proceed as from the rest cloth in ordinary circumstances.

In reading the thermometer great care must be taken to bring the eye exactly opposite the tip of the index or the column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus, if the thermometer be read—33° 0', 40° 0', or again, 40° 0', 40° 0', 40° 0', according as it indicates a little under, an exact coincidence with, or a little over 40°, or 40¹/₂, respectively, it should be noted—32° 9', 40° 0', or 40° 1', or 40° 2', or 40° 3', more or less, as may be required.

In reading Fahrenheit'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 then the Hygrometer, and 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 in the course of observing (during the greatest and least degrees of temperature) the thermometer is not to be removed from the station.

and difference when the self-registers ming thermometers are read, it is not in winter at least, the extreme range occurred at any hour, and it is necessary to refer their occurrence to their proper meteorological conditions. In the Society's schedules, the indications registered on the self-registers are those of a series of phenomena commencing at 9 P.M. on the 31st day, and extending till 9 P.M. on the 3^d.

No instrument ought to be used for Meteorological purposes until it has been carefully tested by comparison with a standard Thermometer. When such Thermometers, as are not graduated on the stem, must merely on the attached scale, undergo repairs, they are very liable to be made good by the person repairing them, 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 thermometer should be uniform; the position scales, and the feet freedom of the Bromide of Mercury; the

OBSERVATIONS,

In cases where the observations cannot be taken daily, the observation may be made on the 5th, 10th, and 25th of each month. When convenient, extra Sea Observations might be taken for other months at greater depths, noting always the Temperature of the Air; and the Hour of Observation. It is also very desirable that observations on Daily Maxima and Minima by Thermometers continuously immersed be instituted at points along the coast, by the method proposed by Mr. T. Stevenson, and already commenced at Pernambuco and Rio de Janeiro. Well and of the water being noted.

J. A. WELLS

Mention what Test-Papers are used, Schönbein or Wolff's? The Paper is affixed by a pin to a box called the Indicator Box and the indications register in connection with the force and direction of the wind at the time of observation, in the following manner:—thus, 32.5, as an Ozonemeter in the schedule will indicate that the Ozonemeter is fixed as 3 on the scale, that its force is from there, 32.5, that it is 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 Electro-meteorology is, in truth, necessary to every complete meteorological observatory.

Remarks.— those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are in general use is given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevalent Diseases, differences in character, colour, velocity, and direction, between the Lower and Upper Strata of clouds, the Colour of the Sky, &c. Remarks ought to be made on the occurrence of Meteors, &c.

Aurora Borealis, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail, or Rain, the Hour of Storms of Wind commencing, attaining their maximum, and ending, as well as such Notes on Storms as have been hinted at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of the Snow-line in winter should be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. should be registered, either in two columns, otherwise unoccupied, or ruled off for the purpose, from the column of 'Remarks.' Observations in connection with the Periodic Return of the Observations in Seasons, possess not only great scientific value, but also considerable importance in connection with the Periodic Return of the Periodic Return of Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena, so that the published Summaries may fairly represent the whole of Scotland.

Observations ought to be confined to individual trees and shrubs to particular species of birds, and, in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm. The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed.

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

EDINBURGH, December 1888.

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

[illegible]

FOREST TREES.		In flower.	Leaf buds first appear.	In leaf.	Diseased of leaves.	GROPS. hibernating variety.	Barley.	Oats or Bisc.	Wheat.	Beans.	Pease.	Potatoes.	Turnips.	Rye Grass.
Alder.	Ash.	Beech.	Birch.	Elm.	Larch.	Time.	Oak.	Sycamore or Plane.						

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

EPINBURGH, December 1888.

register observations only; and nothing that partakes of the nature of deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be estimated from the greater or less obscuration of Clouds to be found on the other side. The amount of Cloud will be estimated (*i.e.* within 20° or 30° of the zenith). The strata of Clouds that appear near the horizon are viewed obliquely; and those being unable to see the bottom of the clouds, the changes may be noted according to their appearance and height. The amount of the Clouds will be estimated from a scale of 0 to 10; thus, when the sky overboard is free from Clouds it is entered 0, when half-covered by clouds 5, wholly covered, 10, and so on.

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

2, W. extreme velocity from S.W. and those in the lower regions from N.W., with one-third the speed of the former. Again, in the second cloud column, an entry of $\frac{4}{3}$ st. will indicate that the higher

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 their properties, of which Mr. Gilbert has been the first to observe.

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

As the germination and growth of crops and plants generally depend greatly on the temperature of the soil,—its amount and consistency—the Council recommend that

Underground

Thermometers. Observations in this interesting department be made at 9 A.M., by Thermometers permanently fixed in the soil, the bulbs being sunk to depths of 3, 12, and 22 inches, and the stems, and above ground protected from the sun's rays, and fitted with sloping 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 important, 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, on the ends of piers and rocks round the coast, and that this be impracticable, from the ends of piers and rocks round the coast, and that this be impracticable, from the ends of piers and rocks round the coast.

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 light

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Abays County of Abertshire, in Lat. 57° 5', Long. 2° 52' Distance from Sea 35 miles.

Height of Cistern of the Barometer above Mean Sea-Level 576 feet, above Ground feet.

During the MONTH of November 1892.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.	WIND.				CLOUDS.				SUNSHINE.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <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.		9 A.M.		P.M.			9 h. A.M.												
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	Max. in Shade.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		No. of hours in which it fell.	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.	No.	No.			
		* No.		No.		No.	No.	No.	No.																											
		inches.	°	inches.	°	°	°	°	°	°	°	°	°		°	°	°	°	°	°	°	°		°	°	°					°	°	°	°	°	°
	1	29.75	41	29.73	43	47	28			28	27	27	25		SW	1	H	1			10		6							1						
	2	29.66	45	29.69	47	47	21			37	32	37	35	0.10	S	2	H	1		N	5		5							2						
	3	29.29	50	29.49	48	50	32			43	40	40	39		S	2	S	2			10		3							3						
	4	29.48	50	29.39	53	53	36			45	44	48	47	0.35	S	2	S	3			10		3							4						
	5	29.41	51	29.49	47	51	34			48	47	35	33	0.10	S	3	S	2			10		3							5						
	6	29.66	45	29.71	45	52	27			32	31	38	29		SW	1	N	1		NE	5		6							6						
	7	29.95	43	29.91	48	51	23			31	28	46	44		N	1	SW	2					6							7						
	8	29.80	50	29.70	52	50	23			48	47	48	46		SW	2	S	1			10		3							8						
	9	29.75	48	29.78	50	50	24			51	50	43	41		SE	1	S	2			10		4							9						
	10	29.75	48	29.81	52	54	27			41	40	47	45		SW	2	S	2		SE	9		2							10						
	11	29.85	50	29.84	53	50	37			46	44	45	43		SE	2	S	2			10		2							11						
	12	29.83	50	29.67	52	51	38			42	41	40	37		S	2	S	2			10		2							12						
	13	29.59	50	29.57	53	46	36			40	38	41	40	0.40	S	2	S	1			10		2							13						
	14	29.58	52	29.31	50	44	33			39	37	42	40	0.20	S	1	S	3			10		2							14						
	15	29.18	53	29.62	49	52	37			48	47	32	31		S	3	SW	1			10		2							15						
	16	29.67	46	29.76	45	50	23			31	27	29	27		H	1	H	1					4							16						
	17	29.87	43	29.88	45	42	20			31	25	35	35		S	1	H	1					3							17						
	18	29.80	42	29.76	43	44	20			31	30	32	31		N	1	S	1			10		2							18						
	19	29.62	42	29.71	48	41	23			32	30	35	34	0.20	S	1	N	1			10		2							19						
	20	29.89	50	30.11	51	45	29			38	37	40	38	0.55	S	1	S	1			10		1							20						
	21	30.25	49	30.26	47	47	26			40	40	39	38		S	1	S	2			10		2							21						
	22	30.23	46	30.20	48	47	33			38	37	39	38		S	1	S	2			10		2							22						
	23	30.21	45	30.06	42	43	32			37	36	27	26		S	1	N	1			10		1							23						
	24	30.06	45	30.01	48	44	20			37	33	33	32		NW	1	S	1			10		2							24						
	25	30.15	46	29.95	47	40	30			33	33	42	41	0.5	S	1	S	1			10		1							25						
	26	29.80	46	29.81	47	44	29			40	39	45	43		H	1	SW	1			10		1							26						
	27	29.96	49	29.90	55	50	35			49	47	51	49		H	1	S	2			10		3							27						
	28	29.84	54	29.49	54	55	45			50	48	40	39		S	3	H	2			10		2							28						
	29	29.54	50	29.35	44	54	32			37	35	30	28	0.10	N	3	N	3			10		1							Fall of Snow 1" deep	29					
	30	29.74	42	29.69	39	41	27			32	30	28	27		N	4	N	1			10	SW	8	1						30						
	31																														31					
Sums.		2313	221	2249	241	238	13			275	220	248	202	207		49	47																			
Means.		29.77	47.4	29.75	48.0	47.9	30.1			39.2	37.3	38.3	36.7		163	157																				
Total Corrections for Instrumental Errors.																																				
Corrections for Diurnal Range.																																				
Corrected Means.																																				
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					

NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	cirrus.	ms.	mesos.
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.	sq.	squall.
l.	lightning.	t. s.	thunder.
l. cl.	light clouds.	t. s.	thunder-storm.
l. 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), = 29.721
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.699
 Mean at Station, corrected, and at 32°, = 29.710
 Correction for height, feet above Mean Sea-level, =
 Mean, reduced to 32°, and Sea-level, =
 Highest Reading, corrected for Index error, on the 21st, = 30.260
 Lowest Do. Do., on the 15th, = 29.180
 Difference, or Monthly Range, = 1.080

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 28th, = 55.0
 Lowest in Month, corrected for Index errors, on the 17th, = 20.0
 Difference, or Monthly Range, = 35.0
 "Corrected Mean" of all the Highest, (Col. 5), = 47.9
 "Corrected Mean" of all the Lowest, (Col. 6), = 30.1
 Difference, or Mean Daily Range, = 17.8
 ** 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), = 38.8
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 37.0
 Computed Temperature of Dew-Point, = 34.6
 Do. Elastic Force of Vapour, = 216
 Do. Weight of Vapour in a Cubic Foot of Air, =
 Relative Humidity (Saturation = 100), = 92
 RAIN fell on 9 Days; Amount in Inches, = 2.07

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.	4				2	16	13	1			1.63
P.M.	5					17	3	5			1.57
Mean.		4	0	0	1	16	4	4	1	0	1.60

12.56

Observations made and
 Return verified by

(Signed) Robert Robertson Glen Tana

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Forest of Glen Tana, Aboyne County of Aberdeenshire*, in Lat. *57° 5'*, Long. *2° 52'* Distance from Sea *35* miles.
Height of Cistern of the Barometer above Mean Sea-Level *576* feet, above Ground *576* feet. During the MONTH of *December* 189*2*.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				Rain.		WIND.				CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS. As to occurrences of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.						
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		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.		SUNSHINE. Hours.	9 h. A.M.						Temperature of WELL at depth of feet, No.	Temperature at 1 fathom, and Density.	0-10.	9 A.M.	P.M.	
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sun's rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.		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.
		* No.		No.		No.	No.	No.	No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			No.	No.	No.	No.		No.	No.	No.	No.		No.	No.										No.
		inches.	°	inches.	°	°	°	°	°	°	°	°																									
	1	29.74	41	29.63	35	35	29			31	29	25	23			N	3	N	2			10		3									1				
	2	30.1	36	29.80	42	36	15			25	25	29	27	0.9		N	1	N	1					2									2				
	3	29.28	40	29.1	42	35	17			33	31	30	28			NW	1	N	2			10		10									3				
	4	29.10	40	29.21	41	38	35			27	26	25	22	0.05		S	3	N	2			10											4				
	5	29.41	39	29.44	42	29	23			27	25	26	24			W	4	NW	4			10		3									5				
	6	29.56	44	29.91	43	37	27			33	33	27	25			N	1	W	1			10		1									6				
	7	30.06	40	29.11	44	37	15			19	18	29	27			W	1	W	2														7				
	8	30.06	40	29.71	41	35	15			28	26	38	36	0.8		W	1	W	2					10	2								8				
	9	29.78	43	29.90	40	32	17			29	37	28	27	0.20		N	2	W	2			NE 9		10										9			
	10	29.70	38	29.16	40	33	10			35	33	37	35			SH	1	W	2			10		10									10				
	11	29.1	45	29.1	44	42	24			36	33	35	33			W	1	SH	2			SH 6		10									11				
	12	29.18	47	29.27	48	40	30			33	31	40	39			N	4	N	2			10		10	1								12				
	13	29.62	46	29.73	45	37	28			43	41	29	27			NW	2	N	1			NE 8		10	3								13				
	14	29.55	46	29.54	45	44	29			31	29	35	33			W	1	NW	1			10		10	2								14				
	15	29.61	48	29.68	46	44	30			40	36	45	41			S	1	W	3			10		10	1								15				
	16	29.95	48	29.53	50	46	32			46	40	49	45			W	4	W	4			10		10	1								16				
	17	29.70	51	29.70	57	48	34			37	35	33	31			N	1	N	1			SE 9		10	3								17				
	18	29.55	54	29.65	50	55	52			47	42	40	36			W	4	W	2			S	2	10	4								18				
	19	29.86	52	29.81	49	49	36			39	36	39	37			W	1	W	2			10		10	2								19				
	20	29.25	45	29.90	47	41	28			33	32	37	35			W	1	S	1			10		10									20				
	21	29.94	44	29.87	47	40	28			36	35	39	37			SE	1	S	1			10		10									21				
	22	29.92	48	29.89	47	40	23			40	38	41	39			S	2	S	1			10		10	1								22				
	23	30.1	45	29.91	48	40	25			32	31	35	34			S	1	SH	2			10	SE 8	1									23				
	24	29.91	46	29.77	40	49	46			39	36	32	30			N	2	W	1														24				
	25	29.71	35	29.80	36	40	08			23	21	24	22			N	1	N	1														25				
	26	30.1	38	29.93	40	39	10			12	11	30	27			NE	1	N	1			E 4		10	3								26				
	27	29.07	38	29.95	35	35	10			15	15	23	22			N	1	N	1														27				
	28	30.02	36	29.70	40	32	10			25	25	27	24			NW	1	N	1			10		10	2								28				
	29	29.74	42	29.58	42	43	18			35	33	25	22			H	1	W	1			10		10	2								29				
	30	29.68	44	29.61	43	42	25			27	26	30	27			S	1	S	1			SE 9		10	1								30				
	31	29.81	42	29.81	43	55	21			33	32	25	25	0.6		S	1	S	1			10		10									31				
	Sums.	1410	14	149	14	12	14			69	11	75	08	0.48			51		51																		
	Means.	29.702	43.3	29.664	44.1	39.6	44.3			32.2	30.4	32.4	30.3				1.65		1.65																		
	* Total Corrections for Instrumental Errors.	4.00		4.00						0.4																											
	* Corrections for Diurnal Range.																																				
	** Corrected Means.	29.742	43.3	29.684	44.1																																
	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.	nimbus.		
ci-s.	cirro-stratus.	r.	rain.		
cu.	cumulus.	h. r.	heavy rain.		
cu-s.	cumulo-stratus.	c. h. r.	continued heavy rain.		
d.	dew.	s.	stratus.		
f.	fog.	sc.	scud.		
fr.	frost.	s.	sleet.		
h. fr.	hoar-frost.	s.	snow.		
h.	haze.	so. h.	solar halo.		
h. d.	heavy dew.	sq.	squall.		
hl.	hail.	sq.s.	squalls.		
l.	lightning.	t.	thunder.		
li. cl.	light clouds.	t. s.	thunder-storm.		
li. sh.	light showers.	w.	wind.		
lu. co.	lunar corona.	g.	gale of wind.		
lu. h.	lunar halo.				

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = *29.668*
"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = *29.648*
Mean at Station, corrected, and at 32', = *29.668*
Correction for height, *576* feet above Mean Sea-level, = *0.000*
Mean, reduced to 32', and Sea-level, = *29.668*
Highest Reading, corrected for Index error, on the *7* th., = *30.110*
Lowest Do. Do., on the *3* th., = *29.500*
Difference, or Monthly Range, = *1.110*

S.R. THERMOMETER, (in shade, etc.) Highest in Month, (corrected for Index Errors), on the *19* th., = *55.0*
Lowest in Month, corrected for Index errors, on the *25* th., = *8.0*
Difference, or Monthly Range, = *47.0*
"Corrected Mean" of all the Highest, (Col. 5), = *39.6*
"Corrected Mean" of all the Lowest, (Col. 6), = *24.3*
Difference, or Mean Daily Range, = *15.3*
** Calculated Mean Temperature of Month, = *22.0*
S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the *19* th., = *55.0*
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = *39.6*
Lowest at Night, Black Bulb (corrected for Index errors), on the *19* th., = *8.0*
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = *24.3*
Difference of above means or range ("exposed"), = *15.3*

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = *32.3*
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = *30.4*
Computed Temperature of Dew-Point, = *26.2*
Do. Elastic Force of Vapour, = *1.43*
Do. Weight of Vapour in a Cubic Foot of Air, = *77*
Relative Humidity (Saturation = 100), = *77*
RAIN fell on *5* Days; Amount in Inches, = *0.48*

WIND.											
SUMMARY.											
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	7	1		1	6	1	12	3		1.65	
P.M.	10			5	2	12	2			1.65	
Mean.	8	1	0	1	5	2	12	2	0	1.65	2.72

Observations made and
Return verified by

(Signed) *Robert W. Dalrymple*

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 1856, was to secure perfect uniformity in the system of observations made at all its Stations. Uniformity in the observations is particularly necessary to justify the publication of Monthly Res. between the different Stations, it being found that different results from different observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 A.M. or 9 P.M. Weather-Glasses and Aneroids, though well suited to indicate rough variations of atmospheric pressure, are not fitted for scientific purposes. No Barometer should be used for Meteorological Observation that is not supplied with some means of adjustment or compensation which will secure that the height of the mercury in the tube is accurately measured from the fluctuating surface of the mercury in the cistern.

The Barometer in which the error arising from the fluctuating surface of the mercury in the cistern is entirely got rid of is 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. A. of London, and usually called the Board of Trade Barometer, has the great convenience of requiring no adjustment of the cistern. Its scale indices are not true indices, but so much shorter than the true ones, that it would otherwise arise from the fluctuations of the surface of mercury in the cistern, as it entirely eliminates the error of ordinary observations.

This is an excellent Barometer for ordinary observations, but in a few cases in setting the instrument, owing to the want of a few cases in setting the instrument, it may be stated that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, with the result that none of the readings differed from those of the Standard more than 0.003 inch.

A modification of Fortin's Barometer is used at a number of the Society's Stations, by which the coincidence of the zero point with the surface of the mercury is indicated by a little ivory float, whose stem passes freely through the lid and case of the cistern. When the indexline 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 observer should secure that the whole instrument, including the base, shall be contained mercury, and the attached thermometer shall be in a position to read at one uniform temperature, it is evident that the best position is that in which is least liable to sudden changes of temperature.

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

The errors most frequently made in reading the Barometer are errors of 1.000 inch, 0.500 inch, and 0.050 inch; that is to say, instead of 29.365 inches, either of the following is sometimes set—viz. as 30.365 inches, 28.365 inches, 29.865 inches, or 29.815 inches. Experience having shown that even the very best observers make these mistakes, particular attention is directed to the matter.

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must first be screwed so as to form a tight plug to the cistern, thus preventing the escape of the mercury. Then screw up the mercury not quite to the top of the tube, but to within a quarter of an inch of it, and take down the instrument; it should then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is done by case if, on inclining the instrument, a sharp tap is produced when the mercury strikes the top of the tube. A full 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 know how the air may be expelled, they may be used to observe the effect of the air being expelled, by using the cistern; then screw up the ivory peg tight, so that the escape of the mercury is prevented, and slowly inverted the instrument, placing 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 float, for the float of the cistern, for, will flow out, and the instr

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 and use. The Self-Registering Thermometers, served to four stout posts, also painted white and outside, and fixed in the ground. The posts must be of such a length that when the Thermometers are hung in position the Bulbs of the Minimum Thermometer, and of the Dry and Wet Bulb Thermometers, will be exactly at the same height of four feet above the ground, the Maximum Thermometer being hung immediately above the Minimum Thermometer. The thermometer Box is to be placed over a plot of grass, and 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 ABOVE GROUND, AND METHOD IN PROTECTING THE THERMOMETERS, as vital in every system of Meteorological Observation, since without it Observations made at different Stations are incomparable, thus rendering it impossible to compare the climates of places with each other as regards their most important features.

Professor Phillips, and Negretti and Zamboni's Minimum Thermometers, and Negretti and Zamboni's Minimum Thermometers, are recommended. It is recommended that the column of spirit be graduated on the glass stem. The thermometer should be made, or mounted, by the maker, so that the temperature and bulging at the top of the tube, this does not require examination of the work carried out by each Observer.

Fortunally, Spirit Thermometers may be easily set right by any one, whereas the column of spirit changes to separate. Let the thermometer be taken in the hand, and then forcibly swing down towards the bulb above the head and then forcibly swing down towards the bulb below; the object being on the principle of centrifugal force, to send down the detached portion of spirit till it unites with the column. A few throws, or swinging strokes, will generally be sufficient for the purpose; after which the thermometer should be placed in a standing position, to allow the rest of the spirit still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. Heat should be applied slowly and cautiously to the top end of the tube where the detached portion of spirit is, which, being turned into vapour by the heat, will condense on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for, if this be done, the 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 not at hand, a piece of heated metal will serve instead.

The bulbs of the Thermometers for registering the greatest heat from the sun's rays, and the least from radiation 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 sun's rays, and the heat above the head and then forcibly swing down towards the bulb below; the object being on the principle of centrifugal force, to send down the detached portion of spirit till it unites with the column. A few throws, or swinging strokes, will generally be sufficient for the purpose; after which the thermometer should be placed in a standing position, to allow the rest of the spirit still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. Heat should be applied slowly and cautiously to the top end of the tube where the detached portion of spirit is, which, being turned into vapour by the heat, will condense on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for, if this be done, the 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 not at hand, a piece of heated metal will serve instead.

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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 Zamboni's, or Phillips' 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 mean direction should be taken. In all cases, but especially when the Vane is stationary, 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 Standard Time, or simultaneous observations, pursued at different Stations, is likely to give highly valuable results. The Society has a limited district, and 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 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 Fallowfield, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobstructed situation for observation, and partly from the defective nature of the instruments used. The Rain Gauge should not be placed on a slope or terrace, but on a level piece of ground, in as open a situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from 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., 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 translated 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 end of the rain.

It is read, it being found that the rain projecting above the rim of the gauge, when only measuring-glass is used, care should be taken to hold it quite perpendicular. The Rain Gauge ought to be read daily at 9 A.M., and the reading entered in the Returns of the previous day. If the Gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month. Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow shower occurs, it should be noted in the 'Remarks,' and the letter S affixed to the depth of water received in Gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the Rain Gauge. For wind, rain, and snow, as in the case of the column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Cloud ought to be estimated from the greater or less 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 Cloud is entered from a scale of 0 to 10; when the sky over-head is free from Clouds it is entered 0, when half-covered by Clouds, 5, wholly covered, 10, and so on.

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

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

As the germination and growth of crops and plants generally depend greatly on the temperature of the soil,—its underground amount and constancy,—the Council recommend that Observations in this interesting department be made by Thermometers. Observations in this interesting department be made by Thermometers. Observations in this interesting department be made by Thermometers.

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 tin collars, to prevent rain-water being conveyed to the bulbs by the stems or wooden frames. A knowledge of the nature of the Sea is not only in itself, but in its relation to the Meteorology. The Council therefore recommend that the Temperature