

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Forest of Glen Tana Albyn* County of *Aberdeen Shire*, in Lat. _____, Long. _____, Distance from Sea *35* miles.
 Height of Cistern of the Barometer above Mean Sea-level *210* feet, above Ground _____ feet. During the MONTH of *January* 188*8*.
 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 1st No. —	Temperature at 2nd No. —	Temperature at 3rd No. —	9 A.M. 9 P.M.
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sun/shade.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			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. —	°	°	°	°	°	°	°	°	°			°	°	°	°		°	°	°	°							°	°	°				
	1	29.66	40	28.19	38	35	11			33	32	30	29			W	2	W		SE	9	10	—										1				
	2	28.92	42	29.12	41	34	21			30	30	36	35			SW		W		10	—	—	3										2				
	3	29.37	43	29.51	45	39	21			38	35	39	38	0.30		W	3	SW	4	SE	4	—	10	—									3				
	4	29.25	46	29.29	48	46	29			46	45	39	38	0.65		SW	5	W		10	—	—	—										4				
	5	29.30	49	29.51	50	50	32			41	40	36	35	0.27		N	2	W	1	SE	9	—	10	—									5				
	6	29.65	47	29.65	50	42	25			40	37	40	38			W	3	W		SW	9	SE	6	2									6				
	7	29.78	48	29.81	50	47	32			44	41	50	48			W	2	W		NE	8	—	10	4									7				
	8	29.90	51	30.10	54	52	36			51	49	52	48			W	1	W	5	SE	9	NE	9	3									8				
	9	30.19	55	30.30	53	57	41			55	49	50	45			W	5	W		NE	8	—	5										9				
	10	30.30	51	30.35	46	59	27			46	43	32	31			W	1	W		NE	6	—	5										10				
	11	30.39	44	30.34	42	54	19			27	27	28	28			W	1	SW		N	4	—	6										11				
	12	30.31	40	30.37	39	37	18			34	33	33	32			SW	2	S	1	—	—	—	5										12				
	13	30.44	41	30.50	40	46	17			35	35	37	36			NW		S		10	10	—											13				
	14	30.50	41	30.50	40	41	26			33	32	34	33			SW		S		10	10	—											14				
	15	30.50	39	30.50	45	38	32			32	32	33	32			N		N		NE	9	—	10	—									15				
	16	30.48	42	3.45	39	35	23			29	28	21	20			S		S		10	10	1											16				
	17	30.45	42	30.49	37	36	20			27	27	20	20			S		S		NE	9	—	4										17				
	18	30.49	38	30.49	37	38	10			16	16	11	11			S		S		10	—	6											18				
	19	30.39	34	30.30	33	38	07			16	16	33	32			W	1	W		—	—	6											19				
	20	30.20	33	30.05	35	36	18			46	44	47	45			SW	1	S	1	NE	8	SN	3	5									20				
	21	29.63	44	29.52	53	50	16			44	42	46	44			SW	2	S	2	10	NE	9	4										21				
	22	29.62	53	29.72	50	51	38			49	45	49	46			NW	3	W	2	SE	8	—	6										22				
	23	29.89	49	29.80	49	54	30			45	43	48	45			W	2	W	3	NE	7	—	7										23				
	24	29.81	52	29.85	50	52	37			49	45	48	46			W	2	W		NE	5	—	5														
	25	29.74	52	29.40	48	50	25			35	33	36	34	0.18		W	1	SW	2	10	NE	8	—														
	26	29.61	54	30.00	40	52	27			38	36	34	32	0.20		W	5	N	3	—	10	—	—														
	27	29.88	41	29.91	35	39	24			33	32	31	30	0.15		N	4	W	3	—	10	SE	8	—													
	28	29.98	43	29.94	39	33	12			32	30	34	32			NW	2	W	2	SE	9	—	10	—													
	29	29.96	42	29.94	38	33	19			32	30	33	32			W	1	SW		10	10	1															
	30	29.79	40	29.30	40	35	16			32	32	37	34	0.40		W		SW		NE	9	SE	8	4													
	31	29.12	40	29.69	44	40	20			36	34	35	32	0.80		W	1	W		0	10	+	10	—													
	Sums.	1514	136	149	108	109	99			214	163	202	151	29		52		29																			
	Means.	29.915	44.4	29.932	43.5	43.5	23.2			36.9	35.3	36.5	34.9			168		094																			
	† Total Corrections for Instrumental Errors.																																				
	† Corrections for Diurnal Range.																																				
	"Corrected Means."																																				
	No. of	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						

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

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

NOTATION USED IN GENERAL REMARKS.			
a.	denotes aurora.	m.	denotes meteor.
ci.	" cirrus.	ms.	" meteor.
ci.-cu.	" cirro-cumulus.	n.	" nimbus.
ci.-s.	" cirro-stratus.	r.	" rain.
cu.	" cumulus.	c. h. r.	" continued heavy rain.
cu.-s.	" cumulo-stratus.	s.	" stratus.
d.	" dew.	sc.	" scud.
f.	" fog.	s.	" sleet.
fr.	" frost.	s.	" snow.
h.-fr.	" hoar-frost.	so. ha.	" solar halo.
h.	" haze.	sq.	" squall.
h. d.	" heavy dew.	sq.	" squalls.
hl.	" hail.	t.	" thunder.
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†† = *29.878*
 for Temp. (Col. 2), = *29.916* — *0.038*
 Corrected Mean" of Barometer at 9 A.M., minus the Correction†† = *29.892*
 for Temp. (Col. 4), = *29.932* — *0.040*
 Mean at Station, corrected, and at 32°, = *29.883*
 Correction for height, *210* feet above Mean Sea-level, = *276*
 Mean, reduced to 32°, and Sea-level, = *30.111*
 Highest Reading, corrected for Index error, on the *14* th, = *30.500*
 Lowest Do. Do., on the *2* th, = *28.920*
 Difference, or Monthly Range, = *1.580*

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the *10* th, = *59.0*
 Lowest in Month, corrected for Index errors, on the *19* th, = *7*
 Difference, or Monthly Range, = *52.0*
 "Corrected Mean" of all the Highest, (Col. 5), = *43.5*
 "Corrected Mean" of all the Lowest, (Col. 6), = *23.2*
 Difference, or Mean Daily Range, = *20.3*
 ** Calculated Mean Temperature of Month, = *33.3*

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), = *36.7*
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = *35.1*
 †† Computed Temperature of Dew-Point, = *32.8*
 †† Do. Elastic Force of Vapour, = *186*
 †† Do. Weight of Vapour in a Cubic Foot of Air, = _____
 †† Relative Humidity, (Saturation = 100), = *86*
 RAIN fell on *8* Days; Amount in Inches, = *2.95*

WIND. SUMMARY.											
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	4				3	6	16	2		168	
P.M.	2				8	5	16			0.94	
Mean.	3	0	0	0	5	6	16	1	0	1.31	

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(Signed) *R. Warburton Glen Tana*

Observations made and
 Return verified by

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* Each instrument tested at the Office in Edinburgh bears the stamp "S.M.S.," and a number to be entered in the Heading; or the Number and Initials of the Maker may be here given.
 † Embracing corrections for both capillarity and Index Errors.
 †† The Diurnal Range for Scotland is as yet unknown.
 ††† These "Hygrometrical Deductions" are calculated from Olafsen'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.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Abayne, County of Aberdeen Shire, in Lat. _____, Long. _____, Distance from Sea 3.5 miles.
Height of Cistern of the Barometer above Mean Sea-level 357 feet, above Ground 4 feet. During the MONTH of February 1888.
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.		9 A.M.		P.M.		9 h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		Barometer. * No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sun-rays.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.	Readings of the H. Cup Anemometer. No.	Velocity (0-5), and Direction.	Amount (0-10), and Species.	Velocity (0-5), and Direction.	Amount (0-10), and Species.	Hours.	No. 8 inches.	No. 19 inches.					No. 22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.	9 h. A.M.

BAROMETER, “corrected Mean” at 9 A.M., minus the Correction† = 29.804
for Temp. (Col. 2), = 29.848 — 0.044
Corrected Mean” of Barometer at 9 P.M., minus the Correction† = 29.859
for Temp. (Col. 4), = 29.898 — 0.039
Mean at Station, corrected, and at 32°, = 29.859
Correction for height, 200 feet above Mean Sea-level, = 2.29
Mean, reduced to 32°, and Sea-level, = 29.078
Highest Reading, corrected for Index error, on the 28th, = 30.40
Lowest Do. Do. on the 11th, = 29.02
Difference, or Monthly Range, = 1.38

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 6th, = 54
Lowest in Month, corrected for Index errors, on the 13th, = 8
Difference, or Monthly Range, = 49
“Corrected Mean” of all the Highest, (Col. 5), = 39.4
“Corrected Mean” of all the Lowest, (Col. 6), = 21.5
Difference, or Mean Daily Range, = 17.9
** Calculated Mean Temperature of Month, = 30.4

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

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 32.2
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 31.2
†† Computed Temperature of Dew-Point, = 28.9
†† Do. Elastic Force of Vapour, = 1.60
†† Do. Weight of Vapour in a Cubic Foot of Air, = 1.9
†† Relative Humidity, (Saturation = 100), = 87
RAIN fell on 7 Days; Amount in Inches, = 1.61

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		9	3	0	0	1	1	1	4	0	1.1
P.M.		13	0	0	0	0	5	9	2	0	1.2
Mean.		11	1	0	0	1	3	10	3	0	1.2

(Signed) Robt Walrton Glen Tana Abayne

Observations made and
Return verified by

INSTRUCTIONS FOR TAKING METEOROLOGICAL

WITH REMARKS ON THE USE OF INSTRUMENTS.

Observations, in connection with the periodical return of the seasons.

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

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich or Railway Time only), as specified in the following remarks, or at the top of the nearest punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 A.M. or 9 P.M. Weather-Glasses and Aneroids, though well-suited to indicate roughly variations of atmospheric pressure, are not to be used for Meteorological 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 rising or falling, the fluctuating surface of the mercury in the cistern is entirely got rid of by means of a screw to the bottom of the cistern, which is made of flexible leather, thus rising or depressing the zero of the fixed scale. The point which forms the zero is protected by Mr. Allen of London, and is usually called the Bar of Trade Barometer. Its scale is made of requiring no adjustment of the cistern. Its scales are not free to move, but so much shorter as to compensate the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This is an excellent Barometer for ordinary Observers, inasmuch as it entirely eliminates the error of observation likely to arise in a few cases in setting the instrument to the zero point of a fixed scale when the light is not good. To allow 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 pistonoid is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the vernier.

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

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

As Barometers are liable to be damaged by the introduction of air into their tubes, on removal from place to place, or in being roughly handled, it may be useful to Observers to know how the air may be expelled. First close up the cistern by screwing the Ivory Peg tight, so as to prevent the escape of mercury; then screw up the tube, so as to prevent the escape of air; and, having placed the tube in a position, such as 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.

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Louver-bolted Box for protection from the weather, as shown in the plate by repeated and annoying breakages of Thermometers of similar construction; and as regards Maximum Thermometers, either Negretti and Zamboni, or Phillips's, whether they will act at the highest temperatures they may be required to register. By the laws of the Society, Members and Observers have a right to have their instruments compared by the Secretary, and to advise with him regarding the purchase of instruments. Very great care should be bestowed on the Observations of the Maximum Thermometer being hung immediately above the Minimum Thermometer. The Thermometer Box is to be placed over a pin of grass, and in a free open space to which the sun's rays have free access during as much of the day as surrounding conditions enable the Observer to secure. The Thermometers are suspended on cross-jacks in the centre of the Box, and face the door, which should open to the north.

The Council regard the question of EXTERNALITY 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 Maximum Thermometers, and Kutherford's Minimum Thermometer, are recommended. It is recommended that these Self-Registering Thermometers be graduated on the glass stem. The Minimum Thermometer is liable to two demerits—viz., the column of spirit breaking and part of the spirit distilling by high temperature and lodging at the top of the tube. This demerit is of occasional occurrence with Protected Thermometers, but of frequent occurrence with exposed Thermometers. To obviate a systematic examination of Minimum Thermometers ought to be a regular part of the work done by each Observer.

Formulae; Spirit Thermometers may easily set right by any one, when taken in the hand by the screw down towards the bulb, and above the head and then forcibly swung down towards the foot; the object being on the principle of centrifugal force, to send down the detached portion of spirit till it mixes with the column. A few drops, or swinging strokes, will generally be sufficient for the purpose; after which the Thermometer should be placed in a shaking position, to allow the rest of the spirit still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. The float 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 wind. The Maximum should rest on wooden supports a few inches from the surface of the grass, in an open situation. Snow must not be allowed to cover either of these Thermometers; nor the sun's heat to affect the Minimum Thermometer by distillation. Black-bulbs enclosed in "glass jackets" may also be used, being indeed preferable to the above. It must, however, be added, that the whole subject of a systematic observation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

The Hygrometer in use at the Society's Stations consists of two Dry and Wet Bulb Thermometers usually, but not necessarily, mounted in one frame. As a readily slighty altered form of the instrument, the form of this instrument is specially recommended for the Hygrometrical Observations. Observers are specially recommended to attend to the following conditions.—The bulbs must hang down to at least an inch free from the scales and frame to which they are attached; the frame must be such as will bring the tubes forward by an inch from any board on which it may be suspended; the water-cup must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but in no case under the bulb; the muslin must be of medium fineness, and fastened at the neck of the bulb by the cotton, which also supplies it with water. It must be seen to by the Observer that the muslin is always clean and moist, and the water pure. In frosty weather, observation is a matter of much delicacy, and must be made with great care. The bulb must be moistened by immersion from 15 to 30 minutes before the hour of observation. From the film of ice thus formed evaporation will proceed as from the moist cloth in ordinary circumstances.

In reading the Thermometer great care must be taken to bring the eye exactly opposite the tip of the index or column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus the Thermometer will be read—39.9, 40.0, or 40.1; or again, 40.4, 40.5, 40.6, according as it indicates a little under, an exact coincidence with, or a little over 40°, or 40.5°, respectively. So also 40.1, and 40.2, more or less must be registered 40.2, or 40.3, and 40.7, or 40.8 respectively. In reading Rutherford's Minimum Thermometer, the indication of that end of the index which is next the surface of the spirit is alone noted. On opening the Thermometer Box, the Dry and Wet Bulb Thermometers are to be first, and rapidly, read, inasmuch as they are readily affected by heat from the person of the Observer.

The Hygrometer is read at 9 A.M. and 9 P.M. The Self-Registering Thermometers are read at 9 P.M. only, as indicating the greatest and least degrees of temperature in the 24 hours preceding. It is not a matter of indifference when the Self-Registering Thermometers are read, since, in winter at least, the extremes may occur at any hour; and it is necessary to enter their occurrence to their proper meteorological day. In the Society's schedules, the indications registered on the 31st are those till 9 P.M. on the 31st.

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

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

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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 *March* 188*8*.
 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 Ther- mometer	Barometer.	Attached Ther- mometer	Max. No.	Min. No.	Max. in Shade.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	No. of hours in which it fell.	Amount in inches.	Direction.	Force.	Direction.	Force.	Readings of the H. Cup Anemometer. No. —	9 h. A.M.	Velocity (0—6), and Direction.	Amount (0—10), and Species.	Velocity (0—6), and Direction.	Amount (0—10), and Species.	SUNSHINE. Hours.					No. 3 inches.	No. 12 inches.	No. 22 inches.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°	°	°
	1	30.35	42	30.21	40	37	23			34	33	33	32			N	W	1			NE	9	—	4							1		
	2	30.42	42	29.89	40	41	27			40	36	33	32			NW	3	N	3			NE	9	NW	9	3					2		
	3	29.93	41	29.93	40	41	21			30	29	31	30			N	3	N	3			10	SE	8	2						3		
	4	29.76	36	29.81	40	34	21			33	32	31	31			N	2	N	2			SE	9	NW	7	3					4		
	5	29.81	37	29.61	42	34	20			29	28	35	33			W	2	W	2			NE	8	NW	5	6					5		
	6	29.64	40	29.61	43	41	21			41	39	43	40			W	3	W	2			NE	5	NW	7	4					6		
20	7	29.23	44	29.51	42	47	33			47	45	34	33	0.021		W	4	W	2			NE	9	—	10						7		
	8	29.29	41	29.01	43	50	25			35	34	42	41			S	—	SW	—			—	10	—	10	3					8		
	9	28.88	44	28.79	44	51	37			43	42	42	40	0.017		S	—	SW	1			10	NW	9	5						9		
	10	28.95	43	29.27	42	53	25			41	40	35	34			W	—	W	2			10	—	10	1						10		
	11	29.17	40	29.20	41	43	16			29	28	30	29	0.025		W	2	W	2			10	—	10	—						11		
	12	29.47	38	29.54	33	44	18			28	27	26	25	0.037		S	1	S	2			10	SE	8	2						12		
	13	29.57	35	29.41	34	31	8			25	24	29	28			S	4	W	2			S	7	NW	9	4					13		
	14	29.31	36	29.29	35	35	21			30	29	29	28			W	—	W	1			10	—	10	—						14		
	15	29.35	36	29.51	34	31	20			29	28	26	25	1.00		W	3	E	1			10	—	10	—						15		
	16	29.67	37	29.78	36	35	10			27	26	20	20			E	1	NW	—			10	NW	9	4						16		
	17	29.86	34	30.44	35	32	0.7			20	19	32	32			W	—	SE	1			NE	9	SW	9	5						17	
	18	30.21	37	30.30	42	36	12			29	28	31	30			N	—	SE	1			NE	9	SE	9	7						18	
20	19	30.33	40	30.51	39	42	18			29	28	25	24			NE	1	SW	—			10	—	—	8						19		
	20	30.22	35	30.28	34	42	16			24	21	30	27			W	—	N	—			NE	9	—	—	8						20	
	21	30.22	37	29.89	45	42	0.7			38	32	37	34	0.030		N	—	W	1			W	3	—	—	5						21	
	22	29.74	46	29.39	42	51	29			39	38	34	32	0.019		NE	2	N	2			10	—	10	4							22	
	23	29.39	40	29.24	43	40	21			30	29	33	32			N	2	N	2			10	—	10	2							23	
	24	29.25	40	29.29	37	42	23			35	33	34	33	0.090		A	3	N	2			10	—	10	—							24	
20	25	29.80	40	28.88	42	44	25			33	32	34	32	0.065		N	1	N	1			NE	9	NW	8	2							25
	26	28.85	39	28.89	42	34	17			33	32	32	31	0.065		N	2	A	1			10	NE	9	—							26	
	27	28.76	40	28.83	28	36	21			30	29	15	14			NW	1	W	—			SE	9	—	—	4						27	
20	28	29.26	40	29.40	40	36	01			16	14	33	32	0.060		SW	—	N	2			SE	9	—	10	2						28	
	29	28.95	38	29.10	43	36	0.8			35	34	36	35	1.17		N	—	W	1			10	—	10	—							29	
	30	29.19	40	29.50	43	37	26			36	35	34	33			N	—	NW	1			10	NW	6	2							30	
	31	29.66	42	29.89	42	39	25			35	33	37	35			N	2	W	1			SE	9	NW	7	4						31	
	Sums.	16.04	226	16.13	239	30	72			71	27	66	29	0.582																			
	Means.	29.57	34.0	29.52	39.5	29.9	19.4			32.3	30.9	32.1	30.9																				
	† 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-en.	cirro-cumulus.	h.	hail.		
ci-s.	cirro-stratus.	r.	rain.		
cu.	cumulus.	h r.	heavy rain.		
cu-s.	cumulo-stratus.	c. h. r.	continued heavy rain.		
d.	dew.	s.	stratus.		
f.	fog.	sc.	scud.		
fr.	frost.	s.	sleet.		
h-fr.	hoar-frost.	so. ha.	solar halo.		
h.	haze.	sq.	squall.		
h. d.	heavy dew.	sq.	squalls.		
hl.	hail.	t. s.	thunder storm.		
l.	lightning.	w.	wind.		
li. cl.	light clouds.	g.	gale of wind.		
li. sh.	light showers.				
lu. co.	lunar corona.				
lu. ha.	lunar halo.				

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

BAROMETER, “corrected Mean” at 9 A.M., minus the Correction†† for Temp. (Col. 2), = *29.489*
 Corrected Mean” of Barometer at 9 P.M., minus the Correction†† for Temp. (Col. 4), = *29.491*
Mean at Station, corrected, and at 32°, = *29.490*
 Correction for height, *250* feet above Mean Sea-level, = *2.28*
Mean, reduced to 32°, and Sea-level, = *29.718*
 Highest Reading, corrected for Index error, on the *10*th, = *30.350*
 Lowest Do. Do., on the *7*th, = *28.760*
 Difference, or **Monthly Range**, = *1.590*

* 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.
 † Enlarging corrections for both capillarity and Index Errors.
 ‡ The Diurnal Range for Scotland is as yet unknown.
 § Practically, though not absolutely a mean correction.
 ¶ These “Hygrometrical Deductions” are calculated from Glaisher’s Hygrometrical Tables, Second Edition 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 *10*th, = *53*
Lowest in Month, corrected for Index errors, on the *28*th, = *—1*
 Difference, or **Monthly Range**, = *52*
 “Corrected Mean” of all the Highest, (Col. 5), = *39.9*
 “Corrected Mean” of all the Lowest, (Col. 6), = *—10.4*
 Difference, or **Mean Daily Range**, = *24.5*
 ** Calculated **Mean Temperature** of Month, = *29.6*
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), = *32.2*
Mean (corrected) A.M. and P.M. Reading of **Wet Bulb**, (Cols. 10 and 12), = *30.9*
 ‡ Computed **Temperature of Dew-Point**, = *28.1*
 ‡ Do. **Elastic Force of Vapour**, = *1.53*
 ‡ Do. **Weight of Vapour in a Cubic Foot of Air**, = *24*
 ‡ **Relative Humidity**, (Saturation = 100), = *84*
RAIN fell on *12* Days; Amount in Inches, = *2.58*

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		12	2	1	0	4	1	9	2	0	1.4
P.M.		10	1	2	1	3	12	2	0	0	1.4
Mean.		11	1	1	1	2	2	11	2	0	1.4

Observations made and
 Return verified by

(Signed) *Robert Warburton Glen Tana*

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Abeyne, County of Aberdeen, in Lat. _____, Long. _____, Distance from Sea 3.5 miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet. During the MONTH of April 1888.
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 surface and Dusky.	9 A.M.	9 P.M.					
		Barometer. * No. —	Attached Ther- mometer No. —	Barometer. No. —	Attached Ther- mometer No. —	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb. No.	Wet bulb. No.	Dry bulb. No.	Wet bulb. No.			Direction.	Force.	Direction.	Force.		Velocity (0—5), and Direction.	Amount (0—10), and Species.	Velocity (0—5), and Direction.	Amount (0—10), and Species.		No. — 3 inches.									No. — 12 inches.	No. — 22 inches.	9	A.M.	9 P.M.
1	29.85	41	29.70	46	40	25			32	30	40	38			NW	1	N	2	NE	5	-	-	5								1								
2	29.69	44	29.84	44	43	27			37	35	32	30	0.014		N	3	N	1	NE	9	NW	9	4								2								
3	29.89	41	29.78	44	39	23			32	31	35	33			N	2	N	.	SE	9	SW	6	2									3							
4	29.64	42	29.88	43	38	24			36	34	40	38			N	2	W	.	10		10	4										4							
5	30.02	39	30.09	45	40	19			36	33	35	32			N	1	NW	1	NE	9		10	5									5							
6	30.65	42	30.11	42	42	27			37	34	35	33			N	1	N	.	NE	7		10	9									6							
7	30.11	44	29.87	40	46	31			40	38	35	33			NW	1	N	.	10	SE	7	4										7							
8	30.89	41	29.97	42	45	18			32	31	32	31			S	.	W	2	SE	9	W	8	9									8							
9	29.95	44	29.89	45	47	18			36	33	32	31	0.010		N	2	NE	1	10	NE	6	5										9							
10	29.82	43	29.71	47	42	27			42	40	38	37	0.020		NW	1	W	1	NW	7	-	10	-									10							
11	29.62	45	29.59	46	48	30			38	37	36	35	0.080		NW	3	W	2	10	SE	9	5										11							
12	29.62	47	29.31	44	44	29			40	35	38	35			N	3	W	2	NE	9	SW	6	4									12							
13	29.19	45	29.44	50	48	27			48	42	40	38			W	4	SW	2	NW	8	NW	6	9									13							
14	29.51	47	29.68	50	53	28			47	43	43	41			N	1	W	1	NW	5	NE	7	8									14							
15	29.68	46	29.55	53	53	29			43	41	41	39	0.015		SE	1	W	1	SW	9		10	2									15							
16	29.50	46	29.39	50	56	35			47	44	47	44			W	.	W	1	N	3	SE	9	9									16							
17	29.44	51	29.38	52	50	28			44	43	46	44			S	2	S	1	10		10	-										17							
18	29.24	48	29.30	48	55	23			44	43	36	35			N	.	SW	1	10	NE	9	6										18							
19	29.38	45	29.50	48	50	31			42	40	46	44			N	.	NE	1	10		10	3										19							
20	29.65	45	29.81	44	32	29			39	38	36	33			NE	3	W	1	10	SW	5	2											20						
21	29.84	42	29.80	39	40	29			37	34	32	31			W	2	SW	.	NW	8	NE	4	5										21						
22	29.82	40	29.90	45	45	24			35	33	40	39	0.038		N	.	N	2	SW	5		10	1/2										22						
23	29.97	42	30.08	43	43	20			38	36	39	37			NW	1	NE	1	W	8	NW	9	2										23						
24	30.13	39	30.11	43	39	31			39	36	35	32			NE	2	NE	2	SE	7	NE	8	8										24						
25	30.12	41	29.97	50	42	19			39	33	40	38			NE	2	N	1	10	SW	5	2											25						
26	29.66	47	29.88	47	54	33			45	40	39	36			W	.	NW	1	E	2	SE	8	5										26						
27	29.76	47	29.80	50	53	32			47	42	30	45			SW	.	SW	2	10	NE	9	8											27						
28	29.62	49	29.23	52	53	31			37	34	33	32			W	4	W	3	10	SW	8	5											28						
29	29.19	50	29.32	50	58	36			47	40	43	39			W	3	W	.	NE	9	NW	6	8										29						
30	29.33	47	29.24	51	53	30			47	41	43	39			SW	2	W	1	NE	8		10	5										30						
31																																	31						
Sums.		1514		1612		12	5	16	214	254	222	222	177		47		37																						
Means.		29.722		29.722		29.722		29.722		29.722		29.722			16		17																						
+ 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								

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction^{††} for Temp. (Col. 2), = 29.692
Corrected Mean^{††} of Barometer at 9 P.M., minus the Correction^{††} for Temp. (Col. 4), = 29.676
Mean at Station, corrected, and at 32°, = 29.684
Correction for height, 750 feet above Mean Sea-level, = 2.26
Mean, reduced to 32°, and Sea-level, = 29.910
Highest Reading, corrected for Index error, on the 24 th, = 30.130
Lowest Do. Do., on the 24 th, = 29.190
Difference, or Monthly Range, = 0.940

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 10 th, = 58.0
Lowest in Month, corrected for Index errors, on the 9 th, = 18.0
Difference, or Monthly Range, = 40.0
"Corrected Mean" of all the Highest, (Col. 5), = 40.7
"Corrected Mean" of all the Lowest, (Col. 6), = 16.7
Difference, or Mean Daily Range, = 20.0
** Calculated Mean Temperature of Month, = 36.7
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 10 th, = 58.0
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 58.0
Lowest at Night, Black Bulb, (corrected for Index errors), on the 10 th, = 18.0
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 16.7
Difference of above Means or Range ("exposed"), = 40.0

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 29.3
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 26.7
Computed Temperature of Dew-Point, = 33.3
Do. Elastic Force of Vapour, = 1.91
Do. Weight of Vapour in a Cubic Foot of Air, = 870
Relative Humidity, (Saturation = 100), = 870
RAIN fell on 6 Days; Amount in Inches, = 0.177

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Variable.	Mean Force.
A.M.		11	30	1	22	0	5	0	16		
P.M.		7	40	0	14	22	0	11			
Mean.		9	40	0	23	9	3	0	16		

(Signed) Robt Warburton Glen Tana Abeyne

Observations made and
Return verified by

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Glen Tana Aboyne* 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 *May* 188*8*.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.		WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.		
		9 h. A.M.		9 h. P.M.		Protected in Shade 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		Readings of the H.C. Cup Anemometer. No. —	9 A.M.		P.M.		9 h. A.M.								
		Barometer. * No. —	Attach- ed Ther- mometer No. —	Barometer. No. —	Attach- ed Ther- mometer No. —	Max. No. —	Min. No. —	Max. in Sun's rays No. —	Min. on Grass. No. —	Dry bulb.	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. 8 inches.	No. 12 inches.					No. 22 inches.	
																																	inches.
		No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —	No. —		No. —	No. —	No. —					No. —	No. —
1	29.04	50	29.10	53	50	28			45	40	49	48	0.010	W	NE	1			SE	5	NE	8	4									1	
2	29.22	49	28.96	46	53	21			43	42	40	38	0.030	W	1	SW	2		W	4	NW	7	3									2	
3	28.88	47	29.51	52	54	30			44	42	41	39		NW	3	W			10		10	2										3	
4	29.75	49	29.73	50	53	30			42	38	30	28		W	1	W	2		SE	6	NW	4	5										4
5	29.68	48	29.86	50	51	29			41	39	42	38		W	3	W			NW	4	NW	9	6										5
6	29.89	49	29.78	55	54	30			54	46	50	45		W	2	SW	4		10	SE	6	5											6
7	29.75	54	29.69	56	63	45			63	54	54	50		W	2	W	2		NW	6	N	3	7										7
8	29.73	55	29.94	50	66	40			47	40	35	34		W	2	W	3		NW	6	SE	8	5										8
9	30.09	49	30.19	45	52	28			41	36	40	38		W	3	W	2		NW	9	SE	7	3										9
10	30.23	47	30.29	48	51	31			42	37	41	39		N	3	N	1		10	SE	9	6											10
11	30.3	46	30.28	50	55	30			46	40	44	43		N	2	N	1		SE	6	SE	8	7										11
12	30.23	47	30.10	50	57	30			49	45	46	45	0.012	NW	1	W	2		NE	6	NW	9	9										12
13	29.81	48	29.77	49	61	34			57	50	45	44		NW	4	N	5		SE	9	—	10	6										13
14	29.75	48	29.59	48	55	29			40	39	42	41		NW	5	W	1		NW	9	—	10	3										14
15	29.46	45	29.39	52	46	30			40	39	44	43	0.016	S	1	S	1		10		10	3											15
16	29.47	48	29.27	49	51	30			50	45	44	43	0.010	W	1	S	—		10	NE	9	1											16
17	29.12	48	29.18	55	53	35			38	35	50	49		SW	1	S	1		NE	9		10	2										17
18	29.42	44	29.56	59	59	39			52	49	55	53		SW	3	S	1		SW	9		10	2										18
19	29.57	57	29.51	59	60	45			60	58	54	53	0.04	SW		N	2		10	SW	8	6											19
20	29.71	56	30.00	57	58	38			53	51	49	49		W	2	N	1		10		10	4											20
21	30.24	52	30.30	55	65	27			55	50	49	48		NW		S	—		SE	2	—	10											21
22	30.27	51	30.33	57	68	26			54	50	48	47		E		NE	—		N	2	—	11											22
23	30.38	52	30.32	55	65	32			58	51	48	47		E		E	—		NE	6	—	11											23
24	30.35	51	30.24	53	59	27			53	46	42	40		NE	1	N	—		N	3	—	10											24
25	30.19	49	30.09	52	63	24			53	45	46	45		NW		N	1		NE	6		10	5										25
26	30.03	51	29.82	50	56	33			41	40	41	40		N	1	W	1		10		10	6											26
27	29.71	47	29.69	50	55	26			42	40	48	47	0.015	E		W	2		10		10	—											27
28	29.77	44	29.81	45	45	23			41	39	46	45		NE	1	NE	1		10	NW	9	4											28
29	29.86	61	29.63	49	47	17			40	32	41	40		NE	9	S	4		NE	9		10	2										29
30	29.17	47	29.13	54	48	32			48	43	50	49	1.25	S	5	S	2		10	NE	9	3											30
31	29.26	51	29.59	53	57	37			51	48	48	43		SW	2	W	—		NE	8		10	5										31
Sums.	23.54	1415	23.58	1414	13	185	36		237	109	159	111	138																				
Means.	29.760	49.9	29.760	51.6	56.0	31.2			47.6	43.5	45.1	43.6																					
† Total Corrections for Instrumental Errors.																																	
† Corrections for Diurnal Range.																																	
“Corrected Means.”																																	
No. of Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			

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

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

NOTATION USED IN GENERAL REMARKS.

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

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† for Temp. (Col. 2), = *29.702*
Corrected Mean" of Barometer at 9 P.M., minus the Correction†† for Temp. (Col. 4), = *29.694*
Mean at Station, corrected, and at 32°, = *29.698*
Correction for height, 200 feet above Mean Sea-level, = *2.22*
Mean, reduced to 32°, and Sea-level, = *29.920*
Highest Reading, corrected for Index error, on the 27th, = *30.470*
Lowest Do. Do., on the 3th, = *28.880*
Difference, or Monthly Range, = *1.590*

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 27th, = *68.0*
Lowest in Month, corrected for Index errors, on the 29th, = *17.0*
Difference, or Monthly Range, = *51.0*
"Corrected Mean" of all the Highest, (Col. 5), = *55.5*
"Corrected Mean" of all the Lowest, (Col. 6), = *31.2*
Difference, or Mean Daily Range, = *24.3*
** Calculated Mean Temperature of Month, = *43.4*

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

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = *46.4*
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = *43.5*
†† Computed Temperature of Dew-Point, = *40.2*
†† Do. Elastic Force of Vapour, = *2.50*
†† Do. Weight of Vapour in a Cubic Foot of Air, =
†† Relative Humidity, (Saturation = 100), = *80*
RAIN fell on 8 Days; Amount in Inches, = *1.38*

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		3	2	3	0	3	4	10	5	0	17
P.M.		7	3	1	0	7	2	11	0	0	14
Mean.		5	3	2	0	5	3	10	3	0	15.5

2.25

(Signed) *Robt Warburton Glen Tana*Observations made and
Return verified by

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 June 1888.

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 h. A.M.	9 A.M.		P.M.		SUNSHINE. Hours.	9 h. A.M.								
		Barometer. * No.	Attach- ed Ther- mometer	Barometer. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.		Velocity (0-10), and Species.	Amount (0-10), and Species.	Velocity (0-10), and Direction.	Amount (0-10), and Species.		No. — 3 inches.					No. — 12 inches.	No. — 22 inches.		
																																	inches.	°
1	29.85	50	30.05	49	57	34			46	42	42	39			W	4	SW	5		NW	9	NE	6	5							Fall of snow	1		
2	30.13	46	29.85	42	53	29			42	38	39	38	1.20		W	1	N	2		SE	7		10	2							Snow 4 inches deep	2		
3	29.88	46	29.80	43	38	25			40	39	37	36	2.0		W	2	N	1		10													3	
4	29.87	41	30.10	49	39	26			38	37	39	37			N	1	N			10	NE	6	3										4	
5	30.13	47	30.10	47	50	24			47	42	42	40			N		SE	2		SE	8		10	10									5	
6	30.01	45	29.85	42	63	20			48	43	41	40			SE	3	W			10	SW	7	4										6	
7	29.88	46	29.85	48	38	25			38	37	40	38	0.070		N	2	N	1		SE	9			6									7	
8	29.79	50	29.77	48	47	25			34	33	40	38			W		NW	2		10	NE	5	7										8	
9	29.87	41	29.85	52	51	33			45	43	42	38			S		SW			10	W	4	3										9	
10	29.66	52	29.81	49	62	37			55	52	51	50			S	1	W			SW	7	N	5	9									10	
11	29.82	51	29.65	51	61	30			56	55	53	49			S	1				NW	6	NE	7	5									11	
12	29.47	58	29.32	52	60	42			51	50	48	47			S		SW	2		10			8										12	
13	29.49	52	29.63	52	58	38			52	52	50	47			S	2	W			NW	9	N	5	8									13	
14	29.73	57	29.77	52	60	30			56	52	58	56			N	1	NW			SE	6	SW	8	4									14	
15	29.73	52	29.84	53	62	34			57	54	53	52			N	1	N			SE	9			6									15	
16	29.86	52	29.88	53	60	39			47	46	50	48			NE	1	N			10	SE	5	10										16	
17	29.85	50	30.00	56	64	38			50	48	49	47			N		N	1		SE	4	SW	2	11									17	
18	30.13	53	30.20	52	68	30			49	46	46	44			N	2	N			10			8										18	
19	30.21	51	30.11	52	56	36			48	44	41	40			NE	1	N			10	NW	9	10										19	
20	30.13	53	30.08	52	61	34			51	46	46	45			E	1	N	1		NE	8	NE	9	10									20	
21	30.13	54	30.11	50	63	39			52	49	50	49			N		N			10	N	7	9										21	
22	30.15	52	30.18	49	66	27			50	47	45	44			NE	1	N			10			9										22	
23	30.21	51	30.11	50	65	25			62	50	50	47			E		N	1		N	6			12									23	
24	30.10	55	30.02	57	62	20			56	52	50	48			N	2	SE	2						12									24	
25	30.82	54	29.95	59	57	25			61	54	56	54			E		E			NE	3	W	6	12									25	
26	29.91	57	29.79	60	75	36			63	58	57	56			E		N							12									26	
27	29.69	58	29.53	53	76	34			60	56	52	50			NE		E			SE	7		10	10									27	
28	29.47	61	29.39	57	72	46			53	50	54	54	0.10		E		E			10		10											Very misty slight showers of Rain	28
29	29.47	56	29.53	53	57	37			48	45	44	43			N	2	N	2		10		10	2										29	
30	29.62	53	29.46	50	53	37			45	43	46	42			N	3	N	3		10		10	5										30	
31																																		31
Sums.		1422	9	2588	32	771	58		009	211	156	337			337	2		5																
Means.		29.858	51.1	29.846	51.1	59.6	31.8		50.9	46.6	47.0	45.2			10.1			.83																
† 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			

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction^{††} for Temp. (Col. 2), = 29.798
Corrected Mean^{††} of Barometer at 9 P.M., minus the Correction^{††} for Temp. (Col. 4), = 29.786
Mean at Station, corrected, and at 32°, = 29.887
Correction for height, 200 feet above Mean Sea-level, = 2.22
Mean, reduced to 32°, and Sea-level, = 30.014
Highest Reading, corrected for Index error, on the 23rd, = 30.210
Lowest Do. Do., on the 12th, = 29.320
Difference, or Monthly Range, = 0.890

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 7th, = 76.0
Lowest in Month, corrected for Index errors, on the 6th, = 20.0
Difference, or Monthly Range, = 56.0
"Corrected Mean" of all the Highest, (Col. 5), = 58.5
"Corrected Mean" of all the Lowest, (Col. 6), = 31.8
Difference, or Mean Daily Range, = 26.7
** Calculated Mean Temperature of Month, = 45.1
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), = 48.5
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 45.9
Computed Temperature of Dew-Point, = 43.1
Do. Elastic Force of Vapour, = .279
Do. Weight of Vapour in a Cubic Foot of Air, = _____
Relative Humidity, (Saturation = 100), = 82
RAIN fell on 4 Days; Amount in Inches, = 3.37

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.		11	4	5	1	5	0	4	0		1.07
P.M.		10	0	3	2	0	3	3	2	1	.81
Mean.		14	2	4	2	2	2	3	1	0	.94

(Signed) Robt Warburton Glen TanaObservations made and
Return verified by

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Aboyne, 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 July, 1888.
 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, if not below Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.		Amount in inches.		9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer.		9 A.M.		P.M.						9 h. A.M.				Temperature of Well, at depth of feet. No.	Temperature at 1 fathom, and Density.	9 A.M.	9 P.M.			
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max. No.	Min. No.	Max. No.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	No.	Amount.	Direction.	Force.	Direction.	Force.	No.	Amount.	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.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.					No.	No.	No.	No.					No.	No.	No.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°	°	°	°					°	°	°
1	29.82	50	29.82	54	57	37			48	45	52	48			N		N						10	NW	7	10							1									
2	29.73	51	29.32	53	60	32			50	46	48	46	0.20		N		N						SE	9		10							2									
3	29.24	52	29.22	53	60	39			47	46	48	47	2.20		S	1	W	1					10		10								3									
4	29.25	51	29.31	52	49	39			49	47	46	45	0.80		W	2	W	1					10		10								4									
5	29.38	51	29.58	50	54	38			46	45	46	45			N	3	N	4					10		10								5									
6	29.64	49	29.73	50	52	35			42	41	46	45	0.07		N	1	S	1					10		10	2							6									
7	29.80	48	29.82	49	52	33			49	45	52	50	0.05		W	2	W						NE	9		10	9							7								
8	29.76	52	29.69	55	60	33			54	53	55	54			N	1	N	2					SH	9		10	10							8								
9	29.52	54	29.59	49	63	30			61	56	46	45	0.04		W	3	N	5					NW	9		10	6							9								
10	29.71	52	29.59	50	62	36			47	42	42	41	0.10		NW	5	N	2					SH	9		10	3							10								
11	29.68	49	29.75	48	54	35			47	44	46	45	0.07		N	4	N	4					SE	9		10	4							11								
12	29.84	49	29.89	50	52	38			52	48	46	45			N	4	N	2					NE	6	NE	5	8							12								
13	29.86	48	29.86	58	60	31			50	49	48	46	0.02		N	2	SH	1					10		SE	9	-							13								
14	29.86	54	29.82	57	58	30			49	47	45	43	0.03		S	1	S	2					NW	9		10	8							14								
15	29.73	56	29.63	55	67	29			46	45	51	50	0.40		S	2	S	4					10		10	1								15								
16	29.59	53	29.52	53	61	35			49	48	52	50	0.80		SE	1	S	-					10	SH	6	6								16								
17	29.49	52	29.59	54	52	41			51	50	56	54			E	1	SE	2					10	W	9	3								17								
18	29.55	53	29.73	57	61	40			51	49	50	48			W	2	W	1					10			8								18								
19	29.72	54	29.69	56	73	38			56	53	58	55			W	1	W	-					S	1	NE	7	10							19								
20	29.64	58	29.58	55	75	42			55	54	56	54			NE	1	N	2					10		10	6								20								
21	29.56	56	29.64	52	65	40			52	52	51	50	0.02		SE	2	S	2					10		10	-								21								
22	29.61	54	29.58	53	74	42			52	51	51	50			NE	2	SE	-					10		10	-								22								
23	29.38	55	29.28	56	57	45			56	54	52	53	0.03		SE	2	W	1					10		10	2								23								
24	29.28	54	29.32	55	56	35			54	50	52	53			S	-	W	-					SE	9		10	5							24								
25	29.39	54	29.39	56	66	46			52	53	52	53	0.04		SH	-	N	-					10	NW	7	7								25								
26	29.38	55	29.69	60	68	47			52	50	52	53			N	-	N	-					10		10	6								26								
27	29.59	55	29.51	57	68	47			52	50	49	48			SE	-	N	-					NW	9		10	4							27								
28	29.61	53	29.62	56	58	48			58	56	55	53			N	1	N	2					10		10	6								28								
29	29.62	53	29.69	51	60	30			49	47	50	48			W	-	SH	1					NE	6	NW	8	4							29								
30	29.65	49	29.64	50	59	29			53	50	49	48			N	1	NW	2					10	SE	16	5								30								
31	29.61	47	29.59	53	58	27			56	52	52	50			NW	-	N	1					SE	9	SH	6	9							31								
Sums.		18.5	14	18.17	12	13	14	15	12	14	12	3			45		40																									
Means.		29.605	52.3	29.604	53.4	60.4	37.3	51.4	49.0	50.4	48.9	33.4			1.4		1.3																									
† Total Corrections for Instrumental Errors.																																										
* Corrections for Diurnal Range.																																										
"Corrected Means."																																										
No. of Column		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30											

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† = 29.542
 for Temp. (Col. 2), = 29.605 - 0.063 = 29.542
 Corrected Mean† of Barometer at 9 P.M., minus the Correction†† = 29.538
 for Temp. (Col. 4), = 29.604 - 0.066 = 29.538
 Mean at Station, corrected, and at 32°, = 29.540
 Correction for height, 200 feet above Mean Sea-level, = 2.20
 Mean, reduced to 32°, and Sea-level, = 29.760
 Highest Reading, corrected for Index error, on the 17th, = 29.890
 Lowest Do. Do., on the 3rd, = 29.220
 Difference, or Monthly Range, = 0.670

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 20th, = 75.0
 Lowest in Month, corrected for Index errors, on the 31st, = 27.0
 Difference, or Monthly Range, = 48.0
 "Corrected Mean" of all the Highest, (Col. 5), = 60.4
 "Corrected Mean" of all the Lowest, (Col. 6), = 37.3
 Difference, or Mean Daily Range, = 23.1
 ** Calculated Mean Temperature of Month, = 48.8
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the _____th, = _____
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = _____
 Lowest at Night, Black Bulb, (corrected for Index errors), on the _____th, = _____
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = _____
 Difference of above Means or Range ("exposed"), = _____

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 50.9
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 49.0
 # Computed Temperature of Dew-Point, = 47.0
 # Do. Elastic Force of Vapour, = 32.4
 # Do. Weight of Vapour in a Cubic Foot of Air, = _____
 # Relative Humidity, (Saturation = 100), = 87
 RAIN fell on 15 Days; Amount in Inches, = 3.33

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.	11	2	1	4	4	1	6	2			1.4
P.M.	14			2	5	2	7	1			1.5
Mean.	13	1	1	3	4	1	7	1			1.4

(Signed) Robt. Warburton Gardens Glen Tana

Observations made and
 Return verified by

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Aboyne, 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 1888.
 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 h. A.M.	9 A.M.		P.M.		SUNSHINE. Hours.	9 h. A.M.						
		Barometer. * No.	Attach- ed Ther- mometer	Barometer. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays. No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.		Velocity (0-10), and Direction.	Amount (0-10), and Species.	Velocity (0-10), and Direction.	Amount (0-10), and Species.		No. 8 inches.					No. 12 inches.	No. 22 inches.
1		29.61	50	29.89	54	56	34			58	56	55	53	0.015	N	0	N	0					10	10							1	
2	X	29.95	49	29.91	51	59	29			50	46	52	51	0.010	N	0	N	0		NW	9		10	8					2 Peels of Thunder 4 P.M.		2	
3		29.84	48	29.75	53	63	30			55	49	55	54		S	1	H	1		NE	8		10	2							3	
4	X	29.87	52	29.50	56	60	35			52	49	49	46		H	2	H	1		SE	9	NW	7	10							4	
5		29.71	54	29.85	51	63	38			57	56	49	46	0.008	N	3	H	4					10	10	1						5	
6	X	29.89	53	29.81	54	62	40			58	56	53	50		N	1	S	1					10	10	2						6	
7	X	29.74	56	29.87	59	59	41			58	55	57	55		H	2	H	1					10	N	6	8					7	
8	X	29.67	57	29.79	59	67	37			57	53	55	52		S	0	H	1		SW	8	NW	5	8							8	
9		29.85	57	29.89	59	65	42			59	54	54	53		H	2	N	0		NW	9	NW	9	9							9	
10		29.91	56	30.01	58	63	40			55	52	51	50		NE	0	NW	0					10	10	2						10	
11		30.02	55	29.90	53	59	40			57	56	50	49		SE	0	H	1					10	10	0						11	
12		29.71	55	29.44	60	56	40			53	52	57	52	0.040	SH	3	S	2					10	10	4						12	
13		29.26	57	29.58	54	65	44			55	52	48	45	0.06	N	1	NW	5		SH	4	X	10	2							13	
14		29.80	53	29.91	55	58	36			52	45	52	50		H	5	H	0		NE	7		10	8							14	
15		30.02	53	30.05	56	58	38			47	43	48	46		N	0	N	1					10	SE	9	9					15	
16		30.08	53	30.09	55	58	36			46	42	47	45		N	2	N	2					10	10	1						16	
17		30.12	52	30.09	54	53	37			45	42	47	45		N	2	N	9					10	SW	9	4					17	
18	X	30.12	51	30.02	48	54	37			46	43	49	46		H	0	H	0					10	0	0	10					18	
19	X	30.03	46	29.89	58	58	25			51	48	52	48		E	0	S	1		0	0		10	12							19	
20		29.78	55	29.63	58	65	40			53	52	52	52	0.06	S	1	S	1					10	10	4						20	
21		29.54	56	29.43	56	59	44			52	50	52	52	0.036	S	1	SE	1					10	10	3						21	
22		29.48	57	29.58	56	58	43			57	54	53	52	0.030	H	0	H	0		NE	9		10	4							22	
23		29.56	54	29.32	61	62	37			53	49	59	58		NW	0	S	4		NW	9		10	0							23	
24		29.32	59	29.34	59	61	45			58	56	58	57	0.008	SH	5	S	2					10	10	5						24	
25		29.45	57	29.57	61	66	34			54	50	58	57		NW	0	S	0		NE	5	NW	6	12							25	
26		29.46	59	29.49	57	66	43			53	49	51	50		S	1	NW	1		NW	9	NE	6	8							26	
27		29.44	58	29.39	59	66	43			56	53	50	48		SH	2	SH	1		NE	9	NE	7	9							27	
28		29.40	57	29.32	58	64	40			55	50	52	49		H	2	H	0		NE	8		10	7							28	
29		29.39	55	29.49	53	64	35			53	48	50	47		H	2	H	1		NE	9	SE	9	6							29	
30		29.59	55	29.72	54	62	29			55	48	50	46		SH	1	H	1		SH	4		10	7							30	
31		29.95	52	29.99	56	60	35			56	52	50	47		H	2	H	2		SE	8	NW	9	9							31	
Sums.		1513	16	2275	15	2425	12			151	14	149	11	159		41		36														
Means.		29.728	54.5	29.724	56.0	64.0	37.7			53.8	50.3	52.2	50.0			1.3		1.2														
† 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	

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† = 29.659
 for Temp. (Col. 2), = 29.728 - 0.069 = 29.659
 Corrected Mean" of Barometer at 9 P.M., minus the Correction†† = 29.648
 for Temp. (Col. 4), = 29.724 - 0.076 = 29.648
 Mean at Station, corrected, and at 32°, = 29.650
 Correction for height, 200 feet above Mean Sea-level, = 2.20
 Mean, reduced to 32°, and Sea-level, = 29.873
 Highest Reading, corrected for Index error, on the 17th, = 30.120
 Lowest Do. Do., on the 13th, = 29.260
 Difference, or Monthly Range, = 0.860

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 8th, = 67.0
 Lowest in Month, corrected for Index errors, on the 19th, = 25.0
 Difference, or Monthly Range, = 42.0
 "Corrected Mean" of all the Highest, (Col. 5), = 60.0
 "Corrected Mean" of all the Lowest, (Col. 6), = 37.7
 Difference, or Mean Daily Range, = 22.3
 ** Calculated Mean Temperature of Month, = 48.9
 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), = 53.0
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 50.1
 ‡ Computed Temperature of Dew-Point, = 47.2
 ‡ Do. Elastic Force of Vapour, = 32.5
 ‡ Do. Weight of Vapour in a Cubic Foot of Air, =
 ‡ Relative Humidity, (Saturation = 100), = 81
 RAIN fell on 9 Days; Amount in Inches, = 1.59

WIND.	SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.
A.M.	9	1	1	1	5	4	9	1	0	1.3
P.M.	7	0	0	1	7	1	12	3	0	1.2
Mean.	8	0	1	1	6	3	10	2	0	1.1

* 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.
 †† Fractionally, though not absolutely a minus correction.
 ‡‡ These "Hygrometrical Deductions" are calculated from Glasgow's Hygrometrical Tables, Second Edition only.
 ‡‡‡ While the Diurnal Range is unknown, the Artificial 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) Robt Waburton Glen Tana Aboyne

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tana Aboyne, County of Aberdeen Shire, in Lat. 57° 3', Long. 2° 52', Distance from Sea 3.5 miles.
Height of Cistern of the Barometer above Mean Sea-level _____ feet, above Ground _____ feet.
During the MONTH of September 1888.
The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.		WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.				
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 h. A.M.		9 h. P.M.		Readings of the H.Cup Anemometer. No. _____ 9 h. A.M.	9 A.M.		P.M.		9 h. A.M.							Temperature of WELL at depth of feet. 10.	Temperature at 11 A.M., and 1 P.M., and 1 D.M.	9 A.M. 9 P.M.	
		Barometer.	Attach- ed Ther- mometer	Barometer.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force.	Direction.	Force.		Velocity (0-6), and Direction.	Amount (0-10), and Species.	Velocity (0-6), and Direction.		Amount (0-10), and Species.	No. _____ 8 inches.	No. _____ 12 inches.								No. _____ 22 inches.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°			°																			
	1	29.85	54	29.63	58	60	37			53	50	56	53	0.016	SW	1	SW	1			10		10	2							1				
	2	29.65	56	29.77	58	62	41			56	53	54	53		W	0	SW	0			SE	9		10	3						2				
	3	29.74	57	29.61	58	61	43			52	50	53	50	0.021	W	0	W	1			10		10	5							3				
	4	29.52	56	29.60	55	60	44			55	53	50	49		W	2	W	1			NW	9	SE	9	10						4				
	5	29.60	53	29.68	57	62	32			47	44	55	53		SW	1	W	2			10	NW	8	7							5				
	6	29.58	53	29.50	56	64	37			53	50	51	49		SW	1	W	2			SE	9	NE	9	7						6				
	7	29.82	56	30.12	54	59	41			50	49	48	46		N	3	N	3			10		10	2							7				
	8	30.28	53	30.89	46	53	35			45	43	36	35		N	0	W	1			10	NW	6	6							8				
	9	30.32	57	30.81	40	53	27			47	44	41	40		NE	1	N	1			NE	9	0	0	2							9			
	10	30.11	42	30.02	51	52	22			34	33	45	43		NW	1	W	1			0	0	0	0	7							10			
	11	30.00	47	29.99	57	59	27			50	48	53	51	0.009	W	0	W	3			NE	9	NE	7	0							11			
	12	30.13	54	30.20	52	57	43			56	50	51	48		W	3	W	1			NE	9	SW	6	8							12			
	13	30.28	48	30.22	53	61	30			55	50	55	52		S	1	W	0			SE	6		0	9							13			
	14	30.19	48	30.05	56	67	28			42	40	51	50		S	0	SW	0			SW	5	NW	9	8							14			
	15	29.92	54	29.82	58	63	35			55	52	55	51		SW	0	W	3			SE	4	NE	7	2							15			
	16	30.00	55	30.01	54	61	40			52	48	49	47		NW	2	W	1			NE	5	SE	6	10							16			
	17	30.02	51	30.05	58	65	33			52	48	52	51		W	0	W	0			0	E	5	10								17			
	18	30.12	56	30.11	57	72	35			54	51	53	52		W	0	W	0			10	NW	5	9								18			
	19	30.18	54	30.17	50	66	34			45	44	44	43		SE	1	W	0			0		0	10								19			
	20	30.19	46	30.10	51	68	24			36	35	46	45		N	0	SW	1			0		0	8								20			
	21	30.10	48	30.09	53	65	28			43	41	45	43		NW	2	W	1			0		0	9								21			
	22	30.05	49	29.99	53	70	30			44	42	45	42		W	0	SW	0			NW	6	0	0	8							22			
	23	30.03	49	29.93	57	74	34			52	47	53	52		SE	1	W	1			10		10	9								23			
	24	29.92	59	30.05	50	69	45			53	52	43	41	0.015	S	0	N	1			10		10	0								24			
	25	30.12	48	30.20	51	54	28			48	47	41	40		W	1	NW	1			10		10	2								25			
	26	30.21	48	30.19	50	47	30			42	41	47	46		S	0	S	1			10		10	3								26			
	27	30.11	44	30.02	52	52	29			48	45	47	46	0.010	W	0	S	0			10		10	2								27			
	28	29.95	50	29.71	55	52	30			45	44	50	49		N	0	S	0			10		10	0								28			
	29	29.85	52	29.59	50	53	36			48	47	41	40		NW	4	N	5			10	NE	9	4								29			
	30	29.63	48	29.82	46	53	28			39	37	35	34		N	4	N	5			NE	9		10	4							30			
	31																																31		
	Sums.	29.14	10	29.84	11	14	106			251	178	245	194	0.071		27		36																	
	Means.	29.97	51.5	29.96	53.2	60.5	33.5			48.4	45.9	48.2	46.5			7		12																	
	† 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.	meteora.
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.
hi.	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.	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), = 29.972 - 0.011 = 29.961
Corrected Mean” of Barometer at 9 P.M., minus the Correction†† for Temp. (Col. 4), = 29.961 - 0.011 = 29.950
Mean at Station, corrected, and at 32°, = 29.950
Correction for height, 200 feet above Mean Sea-level, = 2.20
Mean, reduced to 32°, and Sea-level, = 30.126
Highest Reading, corrected for Index error, on the 9th, = 30.320
Lowest Do. Do., on the 28th, = 29.500
Difference, or **Monthly Range**, = 0.820

S.-R. THERMOMETER, (in shade, etc.), **Highest in Month**, (corrected for Index Errors), on the 23rd, = 74.0
Lowest in Month, corrected for Index errors, on the 10th, = 22.0
Difference, or **Monthly Range**, = 52.0
“Corrected Mean” of all the **Highest**, (Col. 5), = 60.5
“Corrected Mean” of all the **Lowest**, (Col. 6), = 33.5
Difference, or **Mean Daily Range**, = 27.0
** Calculated **Mean Temperature** of Month, = 47.0
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), = 48.3
Mean (corrected) A.M. and P.M. Reading of **Wet Bulb**, (Cols. 10 and 12), = 46.2
†† Computed **Temperature of Dew-Point**, = 43.9
†† Do. **Elastic Force of Vapour**, = 28.7
†† Do. **Weight of Vapour in a Cubic Foot of Air**, ... =
†† **Relative Humidity**, (Saturation = 100), = 85
RAIN fell on 5 Days; **Amount in Inches**, = 0.07
WIND. SUMMARY.
Direction. N NE E SE S SW W NW
A.M. 5 1 0 2 4 4 10 4
P.M. 5 0 0 3 5 6 1 0
Mean. 5 0 0 1 3 5 13 3
Calm or Variable. 0 0 9
Mean Force. 0 1 2
Mean Velocity in miles per day. 1.05

(Signed) Robt Warburton Gardens Glen Tana

Observations made and Return verified by _____

FOR TAKING METEOROLOGICAL

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 columns of the Schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 a.m. or 9 p.m. Weather-Glasses and Aneroids, though well-suited to indicate

The Barometer in which the error arising from the fluctuating surface of the mercury in the cistern is entirely got rid of is FOURN^r'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.

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 glass. When the index-line on this little piston-rod is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the remainder.

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

In taking an observation, the Attached theodolite is first mounted on a tripod, and the observer is placed in a position where he must be able to see the object to be observed. The instrument is then brought into the plane of the back and fore sights, and the lower edge of the vernier, which must be carefully adjusted so that it forms 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, must be carefully avoided.

[illegible]

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

The Council regarded the question of UNIFORMITY OF HEIGHT ABOVE SEA LEVEL, and the question of the CORRECTION OF TEMPERATURES TO THE TEMPERATURE OF THE BODY, and face the fact, which should open to the north, that the observations are independent of these things.

Fortunately, Spirit Thermometers may be easily separated at night by the column of spirit chances to separate. Let the Thermometer be taken in the hand by the end farthest from the bulb, and raised above the head, and then forcibly swung down towards the feet; the object being, on the principle of centrifugal force, to send down the detached portion of spirit till it unites with the column. A few throws, or swinging strokes, will generally be sufficient for the purpose; after which the Thermometer should be placed in a slanting

Black-Bath Thermometer.—The thermometer bulb is easily heated by direct radiation from the sun. It may be made, or mended, by the application of a leaden cap, which is soldered to the bulb, and is placed in a shallow lampblack and printer's ink. They are placed in uncracked and uncracked boxes, whose sides protect the bulbs from the wind. The Maximum should be freely exposed to the sun, and the Minimum should rest on wooden supports a few inches from the surface of the grass in an open situation. Snow must not be allowed to cover either of these Thermometers; nor the sun's heat to affect the thermometer bulb. The thermometer bulb is enclosed in a glass jacket, may also be used, being indeed preferable to the ordinary thermometer. It must, however, be added, that the whole subject of the observation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any of these methods.

inch from any board on which it may be suspended; the water must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but in no case under the 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 taken by the Observer that the muslin is always clean and moist, and the water pure. In frosty weather, observation is a matter of such delicacy, and must be made with great care. The bulb must be moistened by immersion from 15 to 30 minutes before the hour of observation. From the film of ice thus formed evaporation will proceed as from the moist cloth in ordinary circumstances. In reading the Thermometer great care must be taken to

The Hygrometer is read at 9 A.M. and 9 P.M. The Self-Registering Thermometers are read at 9 P.M. only, as indicating the greatest and least degrees of temperature in the 24 hours preceding. It is not a matter of indifference when the Self-Registering Thermometers are read, since, in winter at least, the extremes may occur at any hour; and it is necessary to register their occurrence to their proper meteorological day. In the teacher's schedules, the indications registered on the 3d are those of the previous day. The observations on the 3d are those of the previous day, the observations on the 2d, and extending to 9 P.M. on the 3d.

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

In selecting instruments, the following points require attention:—

1. The perfectness of the design of the Barometer in reference to their scales, and the freedom of the Barometer from air: this must

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

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

can be secured for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, the objects should be taken to place it at some distance from shrubs, trees, buildings, or other obstructions, at least as many feet from their base as they are in height. The more important directions towards which it is most desirable to have a free exposure are in the order of their importance, S.W., N.E., S.E., S., and W. The bottom of the Gauge must be perfectly level, and fixed so that it will remain level in all weathers, and in a height of one foot above

Snow-falls.—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 entered in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or inference.

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

Cloud column, an entry of ——— will indicate that the higher 2. east.

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.

A knowledge of the Temperature of the Sea is not only in itself, but in its relations to that of our island, a most important and important branch of Meteorology. The Council therefore recommend that the Temperature of the Sea be carefully taken by a properly constructed apparatus, from boats, or from the coast, where it is not influenced by that of river water, and as little as possible by currents sweeping along the coast, and thus ascertaining the temperature of the land, either greatly heated by the sun, or cooled by nocturnal radiation, and the nature of high

Quesne. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner — thus 3rd — as an Ozone entry in the schedule will indicate that the paper as an Ozone entry on the scale, that the wind is from the N.W., and that its force on the scale 0—5 is 4, or blowing fresh.

assigned. The use of contrivances, ought, therefore, to be taken every advantage of, and a list of such as are in general use are given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevalent Diseases, differences in character, colour, velocity, and direction, between the Lower and Upper Strata of Clouds, the Colour of the sky, &c. Remarks ought to be made on the occurrence of Meteors, auroræ boreales, remarkable depressions, elevations, and fluctuations of the barometrical pressure, &c. &c. The following is a list of the

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

(By Order) A. D.

[illegible][illegible]

Consisted of	Months
Barley,	
Bere or	
Oats,	
Wheat,	
Beans,	
Pease,	
Potatoes,	
Turnips	
Raye Gr	

OBSERVATIONS IN		FOREST TREES.	
	In		
	Flower.		
		Alder,	.
		Asp,	.
		Beech,	.
		Birch,	.
		Elm,	.
		Larch,	.
		Lime,	.
		Oak,	.
		Sycamore or Plane,	.

Glenn Tanna
Sept. 1888

To the SECRETARY

RETARY

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glen Tama Abnaye, County of Aberdeen Shire, in Lat. 57° 3', Long. 2° 52', Distance from Sea 35 miles.

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

During the MONTH of October 1888

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 Bulb.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.		9 h. A.M.											
		Barometer. * No.	Attach- ed Ther- mometer	Barometer. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun/rays No.	Min. in Grass. No.	Dry bulb. No.	Wet bulb. No.	Dry bulb. No.	Wet bulb. No.	No. of hours in which it fell.	No.	Direction.	Force.	Direction.	Force.	Readings of the Li. 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.	
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°						°	°
	1	29.51	44	29.34	42	43	25			34	33	35	34	0.04	N	3	N	4			SE	8		10	4						Snow Showers at intervals through the day fall of Snow A.M. wind 3 1/2 dup	1	
	2	29.06	44	29.22	46	40	25			38	37	38	36	0.35	H	3	H	1				10	S	2	0							2	
	3	29.34	40	29.42	47	43	23			34	33	41	39	0.37	N	1	H	2			NE	8	NH	5	5							3	
	4	29.45	46	29.21	43	49	26			44	42	32	32	0.33	H	3	H	5				10	NH	9	4							Very Stormy all day with Snow Very Stormy all day with Snow Showers	4
	5	29.26	41	29.49	45	45	29			34	32	38	37		H	3	H	5			SE	9		10	3							5	
	6	29.69	43	29.88	49	43	25			34	33	38	35		NH	1	H	1				10		10	2							6	
	7	29.92	46	29.99	54	49	25			38	34	42	40		H	1	H	1				10		10	3							7	
	8	29.98	50	29.99	50	49	30			47	45	50	49		SE	0	S	0				10		10	2							8	
	9	29.97	52	29.95	50	54	37			46	45	41	40		H	1	N	1				10		10	5							9	
	10	29.92	49	29.91	52	56	33			48	45	42	41		SH	1	H	5				10	NH	9	5							10	
	11	29.81	48	29.60	56	53	32			41	40	50	45		H	2	H	4				10	SE	9	6							Very rough night Very Stormy Rough windy	11
	12	29.53	54	29.53	54	54	31			53	50	44	38		N	4	N	4			NE	9	S	7	8							12	
	13	29.71	49	29.89	50	59	30			39	36	37	36		N	4	N	1			SE	9		10	4							13	
	14	29.94	45	29.88	50	43	28			43	39	44	43		N	3	N	2			SE	9		10	6							14	
	15	29.99	53	30.10	55	51	35			50	48	49	47		N	0	SH	0				10		10	3							15	
	16	30.09	52	30.10	54	56	34			57	56	47	45		SH	0	S	0				10		10	1							16	
	17	30.12	50	30.19	52	54	37			45	44	46	44		S	1	S	1				10		10	1							17	
	18	30.15	50	29.99	54	54	37			46	45	50	47		S	1	S	0				10		10	0							18	
	19	30.00	52	30.06	56	52	37			47	45	50	48		S	0	S	0				10		10	2							19	
	20	30.18	53	30.29	52	55	34			53	51	56	54		N	1	S	0				10		10	0							20	
	21	30.33	51	30.35	53	54	38			57	56	42	40		N	0	H	0				10		10	0							21	
	22	30.26	48	30.09	54	48	26			34	33	43	41		H	0	H	1			NE	7		10	5							22	
	23	29.98	52	29.84	54	53	25			53	47	39	38		H	2	H	0			NE	9		0	6							23	
	24	29.75	49	29.61	56	61	29			45	42	52	48		H	2	H	1			NE	9		10	7							24	
	25	29.55	55	29.45	60	58	37			51	48	55	54		S	2	S	1				10		10	6							25	
	26	29.45	58	29.59	63	57	44			57	55	58	56		SH	1	SH	3				10		10	5							26	
	27	29.58	61	29.56	64	64	47			62	59	60	59		H	3	SH	5				10		10	3							27	
	28	29.53	62	29.39	58	65	51			60	58	51	48	0.04	SH	5	H	5			SE	9		0	1							28	
	29	29.64	44	29.70	53	61	48			47	43	45	41		H	5	H	1				0		0	4							29	
	30	29.70	50	29.84	51	52	32			45	43	46	43	0.030	SH	2	S	1			SE	9	NH	6	3							30	
	31	29.31	49	29.41	43	54	34			46	44	36	35		S	2	NH	0				10		0	5							31	
	Sums.	23.50	30.8	23.40	70	49	94			188	123	156	93	1.82		57		55															
	Means.	29.760	49.7	29.758	52.3	52.6	33.0			46.1	44.0	45.0	43.0			1.84		1.76															
	† 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		

BAROMETER, “corrected Mean” at 9 A.M., minus the Correction†† = 29.702
for Temp. (Col. 2), = 29.160... - 0.58...
Corrected Mean† of Barometer at 9 P.M., minus the Correction†† = 29.680
for Temp. (Col. 4), = 29.757... - 0.07...
Mean at Station, corrected, and at 32°, = 29.698
Correction for height, 200 feet above Mean Sea-level, = 0.222
Mean, reduced to 32°, and Sea-level, = 29.913
Highest Reading, corrected for Index error, on the 24th, = 30.350
Lowest Do. Do., on the 30th, = 29.040
Difference, or Monthly Range, = 1.310

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 24th, = 65.0
Lowest in Month, corrected for Index errors, on the 30th, = 23.0
Difference, or Monthly Range, = 42.0
“Corrected Mean” of all the Highest, (Col. 5), = 52.2
“Corrected Mean” of all the Lowest, (Col. 6), = 32.0
Difference, or Mean Daily Range, = 19.6
* Calculated Mean Temperature of Month, = 42.8
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =
“Corrected Mean,” (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =
“Corrected Mean,” (Col. 8), of Black Bulb, Min. on grass, =
Difference of above Means or Range (“exposed”), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 45.5
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 43.5
† Computed Temperature of Dew-Point, = 41.2
† Do. Elastic Force of Vapour, = 2.60
† Do. Weight of Vapour in a Cubic Foot of Air, =
† Relative Humidity, (Saturation = 100), = 85
RAIN fell on 6 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.	5	0	0	1	5	5	14	1	0	1.84	
P.M.	3	0	0	0	8	3	16	1		1.72	
Mean.	4	0	0	0	7	4	15	1	0	1.81	

3.27

(Signed) Robt Warburton Glen Tama AbnayeObservations made and
Return verified by

Oct 1888
Gruena

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 days, and greater depths, nothing alters the temperature of the Air and the Hour of Observation. It is also very desirable that observations on the daily Maxima and Minima of the Thermometers should be made by Mr. L. S. and already commenced at Peterhead and Liverpool. The temperature of the water at the bottom of Wells ought, when practicable, to be taken, both the depth of the Wells, and of the water being noted.

the scale, that the wind is from the N.W., and that its force on the scale 0—5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, thermometrical, and meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observatory. The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours

Remarks.—The most valuable Observations that can be taken are those for which no rules can be given and for which every advantage ought, therefore, to be taken. The use of contrivances, ought, therefore, to be taken in every advantage of, and a list of such as in general use are given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevalent Diseases, differences in character, colour, velocity, and direction between the Lower and Upper Strata of Clouds, the Colour of the Sky, &c. Remarks ought to be made on the occurrence of Meteors, Comets, Auroræ boreales, remarkable depressions, elevations, and fluctuations of the Barometre, Thunder-Storms and remarkable falls of Snow, Hail, Rain, the Hour of Storms of Wind commencing and ending their

observed in the vicinity of a station, the height of clouds. When lofty hills are in the vicinity of a station, the height of the Snow-line in winter should be recorded.

By the use of abbreviations, the state of the weather at 9 a.m. and 3 p.m. should be registered either in two columns, otherwise under one heading, or, if the observations are made at 9 a.m. and 3 p.m. only, under one heading.

Observations in connection with the Periodic Return of the Seasons, possess not only great scientific value, but are also of considerable importance in connection with the local agricultural, horticultural and natural history.

The Council would direct the special attention of Observers to the registration of such phenomena, so that that published Summaries may fairly represent the whole of Scotland.

Observations ought to be confined to individual trees and shrubs;

The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed.

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

A. B.
(By Order)

[illegible][illegible][illegible]

OBSERVATIONS IN CONNECTION		
In	Leaf Buds First appear.	In Flower.
		FOREST TREES.
		Alder,
		Beech,
		Birch,
		Elm,
		Larch,
		Plane,
		Oak,
		Sycamore or Plane,

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 months, and greater depths, noting always the Temperature of the Air, and the Hour of Observation. It is also very desirable that observations on the Daily Maxima and Minima by Thermometers continuously immersed, be substituted at points along the coast, by the method proposed by Mr. L. The temperature of the water at the bottom of Wells ought, when practicable, to be taken, both the depth of the Wells, and of the water being noted.

Temperature of Wind.—When practicable, to be taken, both the depth of the well and of the water being noted.

Mention what Test-Papers are used.—Schönbein's or Mofatt's, etc.

The Paper is affixed by a pin to a board in the Ther-mometer Box.—The indications registered at 9 A.M.

It is desired that these indications be registered at the time of observation, in the following manner:—thus 3 P.M. as an Ozone entry in the schedule will indicate that the Ozone paper is turned at 3 o'clock, so that the wind is from the N.W.; and that its force on the scale, that the wind is 4, or blowing fresh.

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

The Remarks column is unambiguously too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours

Remarks.

The use of contractions, ought, therefore, to be given every advantage of, and a list of such as are in general use are given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevalent Diseases, differences in character, colour, velocity, and direction between the Lovers and Upper Strata of Clouds, the Colour of the Skies, etc. Remarks ought to be made on the occurrence of Meteors, Auroræ, &c. &c. The appearance of the Moon, the appearance of the Barometer, Thunder Storms and remarkable falls of Snow, Hail, Rain, the Hour of Storms and remarkable windings of the Wind.

maximum, and ending as such notes on Storms as have been mentioned above. When lofty hills are in the vicinity of a Station, the height of Clouds and the Snow-line in winter should be recorded. By the use of abbreviations, the state of the weather at 9 A.M. and P.M. should be registered either in two columns, otherwise unoccupied, or ruled off for the purposes from the column of Remarks.

Observations in connection with the Periodic Return of the Seasons, possess not only great scientific value, but are of considerable importance in connection with Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena, so that that the Observations might be confined to individual trees and shrubs;

to particular species of birds, and, in the case of corps, to specific efforts rendered from year to year on a selected piece of ground or farm.

The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed.

The Council recommend

Observers, before purchasing new instruments, 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.

AL. R.

(By Order)

EDMUND, December 1854.

[illegible]

PERIODICAL RETURN	
CHODS,	Seeding variety.
Planting.	
Sowing or	
ab.	
	early,
	ore or Big;
	ts,
	heat,
	ans,
	ase,
	atoes,
	umps,
	re grass,

	Leaf Buds	In Leaf.	Divested of Leaves.	
First appear.				Ber
				Qat
				Wal
				Bee
				Pec
				Por
				Tur
				Ry

	Alder,	.	.	.	.	.
	Beech,	.	.	.	.	.
	Birch,	.	.	.	.	.
	Elm,	.	.	.	.	.
	Larch,	.	.	.	.	.
	Lime,	.	.	.	.	.
	Oak,	.	.	.	.	.

Sycamore or Plane,
--------------------	---	---	---	---	---	---

FOURST TREES.

In Flower.

OBSERVATIONS IN C

222

SECRETARY

Scottish Meteorological Society

122 George Street



Society,
George Street,
ED



THE UNIVERSITY OF

EDINBURGH.

[illegible]

	Crops of Grain, Hay, Potatoes, Wheat, etc.	
--	---	--

[illegible]

Mountain Ash or Rowan, .
Red Flowering Juniperum, .
Rhododendron Ponticum, .
Willyn, .

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.															
In Flower.		In Leaf buds First appear.		In Leaf.		Divested of Leaves.		In Leaf.		Divested of Leaves.		In Leaf.		Divested of Leaves.	
Alder.
Asch.
Beech.
Birch.
Elm.
Larch.
Lime.
Oak.
Sycamore or Plane.
SHRUBS, ETC.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Barberry.
Bottle or Elder.
Broom.
Hazel.
Hawthorn.
Holly.
Laburnum.
Lilac.
Myrtle.
Privet.
Rose.
Shrub.
Strawberry.
Apple.
Black Currant.
Cherry.
Gean.
Gooseberry.
Pear.
Plum.
Strawberry.
FRUITS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Apple.
Black Currant.
Cherry.
Gean.
Gooseberry.
Pear.
Plum.
Strawberry.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.
Sand-Martin.
Starling.
Swan.
Rail or Corn Crane.
MIGRATORY BIRDS.															
First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.		First in Blossom.	
Cuckoo.
House-Swallow.
Lapwing.
Plover.															

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

EDINBURGH, December 1884.

(By Order) A

13.

100

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

The Hours of Observation are of Greenwich Time.

* 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 capillary and Index Errors.
 ‡ The Journal Range for Scotland is as yet unknown.
 § The Journal Range for Scotland is *not* a *minus* correction.
 ¶ These "Hygrometrical Deductions" are calculated from Glaisher's Hygrometrical Tables, Second Edition only.
 † While the Journal 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 10 th,	=	57.0
Lowest in Month, corrected for Index errors, on the 7 th,	=	11.0
Difference, or Monthly Range,	=	46.0
" Corrected Mean " of all the Highest, (Col. 5),	=	45.8
" Corrected Mean " of all the Lowest, (Col. 6),	=	27.9
Difference, or Mean Daily Range,	=	17.9
** Calculated Mean Temperature of Month,	=	36.8

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb , (Cols. 9 and 11),	=	41.9
Mean (corrected) A.M. and P.M. Reading of Wet Bulb , (Cols. 10 and 12),	=	39.8
† Computed Temperature of Dew-Point ,	=	35.8
† Do. Elastic Force of Vapour ,	=	2.18
† Do. Weight of Vapour in a Cubic Foot of Air , ...	=	
† Relative Humidity , (Saturation = 100),	=	83.8
RAIN fell on <u>25</u> Days; Amount in Inches,	=	6.42

(Signed) Robert Warburton Glen Tama Abayne

Observations made and
Return verified by

Epizootic disease prevails among cattle; and the Agricultural condition of the district generally.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Forest of Glen Tarna, Abertoe*, County of *Abertoe*, in Lat. *57° 3'*, Long. *2° 52'*, Distance from Sea *35* miles.
Height of Cistern of the Barometer above Mean Sea-level *210* feet, above Ground *210* feet. During the MONTH of *December* 188*8*.

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 h. A.M.	9 A.M.		P.M.		9 h. A.M.									
		Barometer.	Attach- ed Ther- mometer	Barometer.	Attach- ed Ther- mometer	Max.	Min.	Max. in Sun/shade.	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. _____ inches.	No. _____ inches.	No. _____ inches.					Temperature at surface and Dew point.	9 A.M.	9 P.M.
		* No. _____	_____	No. _____	_____	No. _____	No. _____	No. _____	No. _____	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			_____	_____	_____	_____		_____	_____	_____	_____	_____	_____	_____					_____	_____	_____
		inches.	°	inches.	°	°	°	°	°	°	°	°																						
	1	29.45	36	29.35	45	33	73			32	29	40	39			SE	1	NW	1		N	6		10	3							1		
	2	29.53	42	29.52	44	44	19			37	36	41	40		0.10	SE	0	S	0		NW	8	SW	5	3							2		
	3	29.35	45	29.28	48	48	29			48	47	55	53		0.20	S	2	S	3			10	NE	9	1							3		
	4	29.56	50	29.72	53	56	35			45	44	47	46			E	1	S	0		NW	9		10	6							4		
	5	29.70	51	29.69	54	56	34			48	47	52	50			S	2	S	2			10	NW	6	3							5		
	6	29.85	50	29.80	54	54	34			44	43	50	48			SW	1	N	2		SE	8	NE	8	5							6		
	7	29.61	51	29.60	49	52	32			47	44	51	48			N	2	SW	2		NE	9	NW	9	4							7		
	8	29.65	47	29.81	43	51	28			42	38	34	33			SE	1	H	0		NE	8	NE	7	6							8		
	9	29.96	45	30.03	44	44	22			38	36	50	48			H	1	H	1		SE	8	NE	9	5							9		
	10	30.16	43	30.13	33	43	23			37	35	30	27			SE	0	SE	1			10		0	6							10		
	11	30.05	35	29.98	48	43	12			24	23	37	35			SE	1	S	2		SE	9		0	3							11		
	12	30.00	40	30.00	46	38	14			32	30	42	40			SE	1	SW	4		NE	9	SE	5	4							12		
	13	30.00	44	29.89	48	44	21			42	39	39	36			S	2	S	3			10		10	2							13		
	14	29.92	45	30.10	41	46	28			44	41	40	37			H	2	H	2		SE	9	SE	8	4							14		
	15	30.16	44	30.12	50	46	24			40	37	46	45			N	1	NW	1		NE	9		0	5							15		
	16	30.11	48	29.91	53	47	28			46	41	48	42			H	1	H	3		NW	7		10	2							16		
	17	29.95	49	29.91	46	51	36			48	42	44	40			H	3	H	4		NW	8	N	4	6							17		
	18	29.89	44	29.69	41	52	25			40	37	42	36			H	1	H	3		NE	5	N	4	6							18		
	19	29.50	44	29.22	49	46	21			44	42	49	47		0.10	E	2	S	5		NW	9		10	0							19		
	20	29.32	49	29.19	47	51	32			43	40	44	43		0.15	E	1	SW	1			10		10	0							20		
	21	29.08	46	28.95	48	45	29			42	40	44	43		0.60	E	1	S	4		SE	9		10	0							21		
	22	29.02	47	29.03	50	46	31			44	44	44	45		1.50	SE	4	S	4			10		10	0							22		
	23	29.43	48	29.22	49	46	35			45	44	41	40		0.15	S	3	S	3		NE	9		10								23		
	24	29.00	46	29.29	34	45	30			42	41	40	38			S	2	SW	1			10		10	3							24		
	25	29.37	35	28.96	46	36	14			25	23	35	34		0.20	H	1	SW	2			10	SE	6	4							25		
	26	29.24	41	29.50	40	42	18			35	34	36	34			SW	2	H	3			0		0	5							26		
	27	29.54	36	29.16	39	38	15			25	23	33	30			SE	4	E	2		E	2		0	2							27		
	28	29.14	42	29.58	44	34	15			38	37	35	34		0.22	S	1	H	3		NE	4	E	4	3							28		
	29	29.80	41	30.00	39	40	24			33	32	26	26			H	2	H	1		NE	9		0	4							29		
	30	30.01	31	29.90	37	37	10			19	16	22			0.01	H	2	H	1			0		0	4							30		
	31	29.72	39	29.69	45	40	10			39		35				S	2	H	0			10	SE	9	2							31		
Sums.		2007	1354	1422	167	164	121			278	208	2			293	50	64																	
Means.		29.647	43.7	29.620	45.2	45.3	39.9			39.0	40.7	40.7				1.6	2.1																	
† Total Corrections for Instrumental Errors.																																		
‡ Corrections for Diurnal Range.																																		
“Corrected Means.”		29.647	43.7																															
No. of Column		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			

BAROMETER, “corrected Mean” at 9 A.M., minus the Correction†† = *29.606*
for Temp. (Col. 2), = *0.041*
Corrected Mean” of Barometer at 9 P.M., minus the Correction†† = *29.576*
for Temp. (Col. 4), = *0.044*
Mean at Station, corrected, and at 32°, = *29.591*
Correction for height, feet above Mean Sea-level, =
Mean, reduced to 32°, and Sea-level, =
Highest Reading, corrected for Index error, on the 15th, = *30.16*
Lowest Do. Do., on the 21st, = *28.95*
Difference, or Monthly Range, = *1.21*

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

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 3th, = *58.0*
Lowest in Month, corrected for Index errors, on the 11th, = *10.0*
Difference, or Monthly Range, = *48.0*
“Corrected Mean” of all the Highest, (Col. 5), = *45.8*
“Corrected Mean” of all the Lowest, (Col. 6), = *23.9*
Difference, or Mean Daily Range, = *21.9*
** Calculated Mean Temperature of Month, = *34.8*
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 11th, =
“Corrected Mean,” (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the 11th, =
“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), = *39.8*
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), =
† Computed Temperature of Dew-Point, =
† Do. Elastic Force of Vapour, =
† Do. Weight of Vapour in a Cubic Foot of Air, =
† Relative Humidity, (Saturation = 100), =
RAIN fell on 10 Days; Amount in Inches, = *2.93*

WIND.		SUMMARY.							
Direction.		N	NE	E	SE	S	SW	W	NW
A.M.	2		4	8	7	2	8		
P.M.	1	1	1	10	5	11	2		
Mean.	2	2	5	8	4	9	1		

3.24

Observations made and
Return verified by

(Signed) *Robt. Warburton Forest of Glen Tarna Abertoe*

INSTRUCTIONS

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

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

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

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

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

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

The Barometer should be suspended in as good a light as can be secured, and to facilitate the reading, a piece of white paper may be put behind the tube. It must be hung truly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire, and must not be hung against a wall heated by a fire. The object being to secure that the whole instrument, including the brass fittings, the contained mercury, and the attached Thermometer, shall be, when read, at one uniform temperature. It is evident that the best position for this is in the open air, where the changes of temperature are least taking Observation, the Attached Thermometer is first noted; the mercury must then be gently tapped, and the cistern adjusted until the mercury meniscus is exactly level with the index-line. 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, 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 infrequently 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 those of 1.000 inch, 0.500 inch, and 0.050 inch; that is to say, instead of 29.365 inches, either of the following is sometimes set down—viz., as 30.365 inches, 28.365 inches, 29.865 inches, or 29.815 inches. Experience having shown that even the very best Observers make these mistakes, particular attention is directed to the matter. When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must first be screwed so as to form a tight plug to the cistern, thus preventing the escape of the mercury. Then screw up the mercury not quite to the top of the tube, but to within a quarter of an inch of it, and take down the instrument; it should then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case if, on inclining the instrument, a sharp tap is produced when the mercury strikes the top of the tube. If a dull tap is heard, there is air in the tube, which must be got rid of.

As Barometers are liable to be damaged by the introduction of air into their tubes, on removal from place to place, or in being roughly handled, it may be useful to Observers to know how the air may be expelled. First close up the cistern by screwing the ivory peg tight, so as to prevent the escape of mercury; then screw up the mercury to about half an inch from the top of the tube; and having securely attached the instrument, place the top of it on a yielding substance, such as the bow of a gun, and gently tap the cistern with the palm of the hand so as to get the air to escape. Since there is the column to the cistern whence it has escaped. As soon as 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 glass tube, will show when the whole of the air has been expelled. On hanging up the Barometer, care must be taken to screw down the mercury in the tube before unfastening the float of the cistern, for, if this be not attended to, the mercury will flow out, and the instrument be seriously damaged.

FOR TAKING METEOROLOGICAL OBSERVATIONS, WITH REMARKS ON THE USE OF INSTRUMENTS.

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

The Council regard the question of EXPOSURE or HEIGHT ABOVE GROUND, AND METHOD OF REGISTERING THE THERMOMETERS, as vital in every system of Meteorological Observation, since without it Observations made at different Stations are incompatible, thus rendering it impossible to compare the Climates of places with each other as regards their most important features. Professor Phillips, and Negretti and Zambra's Maximum Thermometers, and Katherford's Minimum Thermometer are recommended. It is recommended that these Thermometers be graduated on the glass stem. The Minimum Thermometer is liable to two demerits—viz., the column of spirit breaking, and part of the spirit distilling by high temperature and lodging at the top of the tube. This demerit is of occasional occurrence with Protected Thermometers, but of frequent occurrence with exposed Thermometers. Hence a systematic examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

Fortunately, Spirit Thermometers may be easily set right by any one, when the column of spirit refuses to separate. Let the Thermometer be taken in the hand, and then, with a small screw towards the raised above the bulb, and then, with a small screw towards the bulb, the object being, the principle of a self-regulating valve, to send down the detached portion of spirit till it unites with the column. A few strokes after which the Thermometer should be placed in a slanting position, to allow the rest of the spirit still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. Heat should be applied slowly and cautiously to the top end of the tube where the detached portion of spirit is, which, being turned into vapor 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 during night, have a black coating, which may easily be made, or mended, by the application of a mixture of lampblack and printer's ink. They are placed in shallow blackened boxes, whose sides protect the bulbs from the wind. The Maximum should be freely exposed to the sun, and the Minimum should rest on open supports a few inches from the surface of the grass, in an open situation. Snow must not be allowed to cover either of these Thermometers; nor the sun's heat to affect the glass jackets; may also be used, being indeed preferable to the above. It must, however, be added, that the whole subject of the observation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

The Hygrometer in use at the Society's Stations consists of two Dry and Wet Bulb Thermometers usually, but not necessarily, mounted on one frame. As apparently slight deviations from the Hygrometric Observations of Observers, specially requested the approval from this apparatus seriously vitiate the results, it is necessary to take such precautions as will tend to attend to the following points. The bulb must be hung down by a chain, and not by a cord, and must be well exposed to the air, and an inch from any wall, so that as will bring the tubes far away from the heat of the sun, and from the influence of the wind. The bulb must be so hung that the scales and frame, which may be attached to the front of the bulb, may be suspended, the water being brought into the bulb from any vessel placed to the side, and a little below the level of the wet bulb, but in no case under the neck of the manometer 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 manometer is always clean and moist, much delicacy, and must be made with great care. The bulb must be moistened by immersion from 15 to 30 minutes before the hour of observation. From the film of two thus formed evaporation will proceed as from the moist cloth in ordinary circumstances.

In reading the Thermometer great care must be taken to bring the eye exactly opposite the tip of the index or tenths of a degree, and noted in decimals. Thus the Thermometer will be read—39.9, 40.0, or 40.1; or again, 40.2, 40.5, 40.6, according as it indicates a little under, an exact coincidence with, or a little over 40°, or 40.3, respectively. So also 40.7, or 40.8, more or less must be registered 40.2, or 40.3, and 40.7, or 40.8 respectively. In reading Ruthven's Minimum Thermometer, the indication of that end of the index which is next the surface of the spirit is alone noted. On opening the Thermometer rapidly, read, inasmuch as they are readily affected by heat from the person of the Observer.

The Hygrometer is read at 9 A.M. and 9 P.M. The Self-Registering Thermometers are read at 9 P.M. only, as indicating the greatest and least degrees of temperature in the 24 hours preceding. It is not a matter of indifference when the Self-Registering Thermometers are read, since, in winter at least, the extremes may occur at any hour; and it is necessary to refer their occurrence to their proper meteorological day. In the Society's schedules, the indications registered on the 31st, and extending till 9 P.M. on the 31st.

No instrument ought to be used for Meteorological purposes till it has been carefully tested by comparison with a Standard Thermometer. As are not got right, the scale must be set on an attached scale under a glass, they are very liable to be used without being re-tested. The Self-Registering, especially the Minimum Thermometers, ought frequently to be compared with the dry bulb of the Hygrometer. The freezing-point of each Thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

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

bering of the scale of every instrument; the rejection of Thermometers, the frameworks of which are not likely to stand exposure to the weather, as shown in the past by repeated and annoying breakages of Thermometers of similar construction; and as regards Maximum Thermometers, either Negretti's and Zambra's, or Phillips's, whether they will 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, the accuracy of which, both as regards Direction and Force, is so essential towards the right discussion of many of the more important problems of the science. A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it oscillates incessantly, the mean direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thickly-planted Stations over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to BAROMETRIC GRADIENTS, and other points connected with storms.

The Council would recommend the Hemispherical Cup Anemometer, a self-registering instrument which shows the amount of Wind that passes it per day; from which the amount of 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 Society's Anemometers recently brought into the market, and of the Society by Mr. T. Stevenson, the Hemispherical Anemometer, and Mr. R. Ballingall, the Society's Observing Station, are recommended as likely to secure uniformity in taking observations on the Force of the Wind. Many cases 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 rain of the Gauge must be perfectly level, and fixed so that it will remain level in all weathers, and be at a height of one foot above ground, over grass. In such gauges as Fleming's, which are furnished with a measuring rod attached to a float, the rod ought to be fixed down, and the float rise to its height only at the time the instrument is read, it being found that a stem projecting above the rim of the gauge seriously interferes with the proper measurement of the Rain-fall. When a measuring glass is used, care should be taken to hold it quite perpendicular. The Rain Gauge ought to be read daily at 9 A.M., and the reading entered in the Returns of the previous day. If the Gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month. Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow shower occurs, it should be noted in the 'Remarks,' and the letter S affixed to the depth of water received in Gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the Rain-Gauge. For wind, rain, and snow, as 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 and simple means for the nonpulsation of Clouds will be given in the following form. The amount of Cloud ought to be estimated from the greater the elevation of the sky overcloud (i.e., within 20° or 30° of the zenith), the greater the amount 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 Cloud's 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 overcloud is free from Clouds it is entered 0, when half covered by Clouds, 5, wholly covered, 10, and so on.

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

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

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

The approximate number of Hours in which objects in the sun's Sunshades, 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,—this amount and constancy,—the Council recommend that Observations in this interesting department be made at 9 A.M., by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 3, 12, and 22 inches, and the stems above ground protected from the sun's rays, and fitted with sloping tin collars to prevent rain water being conveyed to the bulbs by the stems or wooden of the Temperature of the Soil is not only in itself, a knowledge of the Temperature of the Soil, but a most important branch of Meteorology. The Council therefore, earnestly recommend that the Temperature of the Soil be carefully taken by a properly constructed apparatus, from books or if this be impracticable, from the ends of rivers and rocks along the coast, where it is not influenced by that of river water, and as little influenced as possible by currents sweeping along the coast, and thus acquiring the temperature of the land, either greatly heated by the sun or cooled by nocturnal radiation. At or near the time of high

OBSERVATIONS,

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

The Temperature of the water at the bottom of the water, if the temperature of when practicable, to be taken. Well and of the water-being noted. Mention what Test-Papers are used, Schönbauer's, etc. The Paper is affixed by a pin to a board in the Thermometer Box, and the indications registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 35°, as an Ozone entry in the schedule will indicate that the Ozone paper is tinted as 3 on the scale, that the wind is from the N.W., and that its force on the scale 0—5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, thermometrical, and meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observatory. The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours assigned. The use of contrivances, ought, therefore, to be taken every advantage of, and a list of such as are in general use are given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prediction of the weather, in character, count, velocity, and direction, from the lower part of the Strata of Clouds, the Clouds of the Sky, etc. Remarks ought to be made on the occurrence of Auroras, Auroral Boreas, and other phenomena, and on the occurrence of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail, or Rain. The Hour of Storms of such notes on Storms as have been maximum and ending, as well as such notes on Storms as have been limited at Clouds. When lofty hills are in the vicinity of a Station, the Height of Clouds and of the Snow-line in winter should be recorded.

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

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

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

(By Order)

EDINBURGH, December 1854.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.															
Alder,	Asht,	Beech,	Elm,	Larch,	Lime,	Oak,	Sycamore or Plane,								
In															
Flower.															
First appear															
In leaf.															
Directed to															
Leaves.															
Barley,	Bere or Bigg,	Oats,	Wheat,	Beans,	Pease,	Potatoes,	Turnips,	Rye Grass,							
Planting.															
Sorting or															
above Ground.															
In Ear															
First Cut															
or Raised.															