

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS

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*.

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must be screwed so as to form a tight plug to the cistern. Then screw up the mercury to within a quarter of an inch of the top of the tube, and take down the instrument; it may then be carried with the cistern uppermost. Before suspending the Barometer for use, must be ascertained whether the space above the mercury in one tube is a complete vacuum; this is the case when, on inclining the instrument so that the mercury stands in the two tubes,

The Council would strongly recommend that the instruments be furnished with a Hemispherical self-registering instrument which shows at the time of observation may be ascertained the Force of the Wind, at any particular place, enclosed in a Box, painted white outside, and black within, and fixed 4 feet above grass in an exposed position, free from all merely local influences. The laths forming the sides and doors of the Boxes are arranged so as at once to "protect" the thermometers, and to allow a complete ventilation of the interior. The instruments are suspended on cross-laths, in the centre of the Box, and face the door opening to the north. To accommodate a duplicate set of instruments, which is most desirable, boxes are also made to open to the south. These Boxes may be had at the Society's Office.

Self Registering Thermometers.—Professor Phillips's, and Segretti and Zambra's Patent "Maximum" Thermometers are recommended: printed directions for their use may be obtained with each instrument. The "Minimum" Thermometer of Gotherford is recommended when graduated on the glass stem and affixed to a frame separate from the "Maximum." This thermometer is liable to two derangements, both of which must be guarded against, and may be easily remedied by an observer. When the column of spirit breaks, it may be re-united by striking the instrument repeatedly against the palm of the hand; when part of the spirit distils by high temperature, it will be found in the upper lobe, and must be dislodged from thence by heating that part over a lamp; the alcohol will evaporate and again condense in contact with the body of the liquid. These instruments should be hung horizontally.

Rain-gauge.—Many causes conspire to give inaccurate adjustment and reading of the Barometer.

Protection of Thermometers.—The Council of the Society recommend that Self-registering Thermometers and Hygrometers be used in a Box, painted white outside, and black within, that passes it per day; from which also the observations may be ascertained at the time of observation. The Force of the Wind, at any particular place, is also recommended.

Lind's Anemometer is also recommended for use in rain returns. They arise, partly, from the different instruments used. It is, indeed, difficult to find a suitable position for the rain-gauge; but it must be sunk in the ground till its edges close cut grass around its mouth. The readings must be taken daily, and the readings entered in the columns, under the following conditions:—

Snow-falls may, for convenience, be registered in the "Remarks" column, under the indications of the rain-gauge. For want of space in every column, the observer can register *observations* only; and nothing can be done to deduce or infer-

Christiansen
Jan 1867

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Mr ALEXANDER BUCHAN

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK-POST

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

Thus the Thermometer will be read $-39^{\circ}.9$, $40^{\circ}.0$, or $40^{\circ}.1$; or again, $40^{\circ}.4$, $40^{\circ}.5$, or $40^{\circ}.6$, according as it indicates a little under, an exact coincidence with, or a little over 40° , or $40\frac{1}{2}^{\circ}$, respectively. So also $40\frac{1}{2}^{\circ}$, and $40\frac{3}{4}^{\circ}$, more or less must be registered $40^{\circ}.2$ or $40^{\circ}.3$ and $40^{\circ}.7$ or $40^{\circ}.8$ respectively. In reading Rutherford's "Max." and "Min." Thermometers, the indication of that end of the index which is next to the surface of the mercury or alcohol is alone noted. Readings of the Thermometers, especially of the wet and dry bulls, must be rapidly taken, being so readily affected by heat from the person of the observer.

Hour of observing Temperature.—The Hygrometer is read at 9 A.M. and 9 P.M. The self-registering Thermometers are read 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 3rd are those of a series of phenomena commencing at

Ozone.—Mention whether Schönbein's or Moffat's papers are used. The paper is affixed by a pin to a board in the thermometer box, and the indication 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 $\overrightarrow{N.W.}$, 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—6 is "4"; i.e., that it is *blowing fresh*.

Electricity.—Too much importance cannot be attached to electric condition of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper Electrometer is necessary to every complete meteorological observatory.

Remarks.—The "Remarks" column is too narrow, but unavoidably so. Some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are recognised and in use at Green-

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Ghoshawm, Jan., County of _____, in Lat. $69^{\circ} 2' N.$, Long. $6^{\circ} 45' E.$, Distance from Sea 2 miles, 20 feet

Height of Cistern of the Barometer above Mean Sea-level 14 feet, above Ground _____ feet.

During the MONTH of February 1864.

The Hours of Observation are not of Greenwich Time (unstated).

ELECTRICITY. Days of Month.	BAROMETER.			SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.			HYGROMETER. No. 451-832			WIND.			RAIN.			CLOUDS.			THERMOMETERS, under Ground.			SEA- LEVEL	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 began and ended.	Days of Month.				
	9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.		No. 168.		9 h. A.M.		9 h. P.M.						
	Barometer, No. No.	Barometer, No. No.	Attached Thermometer, No. No.	Attached Thermometer, No. No.	Max. No. No.	Min. No. No.	No. No.	No. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	Direction.	Force	No. 168.	Amount in inches.	Velocity, (0-6), and Direction.	Amount (0-10), and Direction.	Velocity, (0-6), and Direction.	Amount (0-10), and Species.	No. 3 inches.	No. 12 inches.	No. 22 inches.				
1	29.2	29.8	29.5	29.5	35	33	35	35	39.3	32.5	40	36	S	SW	S	SW	0.05	0.05	0.05	0.05	0.05	0.05	0	0	0	1	1 p.m. 44		
2	28.9	28.9	29.9	29.9	33	33	33	33	38	34.8	39	36	36	W	W	W	W	0.10	0.10	0.10	0.10	0.10	0.10	0	0	0	2		Snow and rain
3	29.0	28.9	28.9	28.9	40	40	40	40	41	41	41	41	S	SW	S	SW	0.11	0.11	0.11	0.11	0.11	0.11	0	0	0	3			
4	28.9	28.8	28.8	28.8	34	34	34	34	42	41	39	37	S	SW	S	SW	0.07	0.07	0.07	0.07	0.07	0.07	0	0	0	4			
5	28.6	28.4	28.4	28.4	53	53	53	53	36	35	35	34	S	SW	S	SW	0.09	0.09	0.09	0.09	0.09	0.09	0	0	0	5		Rain and hail	
6	28.4	28.4	28.4	28.4	52	52	52	52	34	33	35	34	N	N	N	N	—	—	—	—	—	—	0	0	0	6		Snow	
7	29.0	28.9	28.9	28.9	50	50	50	50	34.5	34	32	32	NW	NW	NW	NW	—	—	—	—	—	—	0	0	0	7		Snow	
8	28.9	28.9	28.9	28.9	24	24	24	24	31	31	31	31	S	E	S	E	—	—	—	—	—	—	0	0	0	8		Snow	
9	29.1	28.8	28.5	28.5	54	54	54	54	34	34	34	34	W	SW	W	SW	—	—	—	—	—	—	0	0	0	9		Snow	
10	28.7	28.8	28.5	28.5	55	55	55	55	41	40	42	40.5	S	W	S	W	0.08	0.08	0.08	0.08	0.08	0.08	0	0	0	10			
11	29.1	29.1	29.1	29.1	36	36	36	36	36	36	38	38	NW	SW	NW	SW	0.21	0.21	0.21	0.21	0.21	0.21	0	0	0	11			
12	29.1	29.4	29.4	29.4	40	40	40	40	44	41	39	39	S	SW	S	SW	0.16	0.16	0.16	0.16	0.16	0.16	0	0	0	12			
13	29.1	29.4	29.4	29.4	34	34	34	34	41	39.8	38.8	36	36	W	NW	W	NW	0.04	0.04	0.04	0.04	0.04	0.04	0	0	0	13		
14	30.2	30.1	30.1	30.1	34	34	34	34	39.5	36	35	34	S	SW	S	SW	0.18	0.18	0.18	0.18	0.18	0.18	0	0	0	14			
15	30.0	30.0	30.0	30.0	31	31	31	31	31	31	32	32	S	E	S	E	1.00	1.00	1.00	1.00	1.00	1.00	0	0	0	15			
16	30.2	30.2	30.2	30.2	29	29	29	29	31	30.5	29	29	N	N	N	N	—	—	—	—	—	—	0	0	0	16		Snow	
17	30.2	30.2	30.2	30.2	—	—	—	—	35.5	35	—	—	S	SE	S	SE	—	—	—	—	—	—	0	0	0	17			
18	30.0	30.0	30.0	30.0	31	31	31	31	41	39	46	45	S	SW	S	SW	0.23	0.23	0.23	0.23	0.23	0.23	0	0	0	18			
19	30.0	30.0	30.0	30.0	43	43	43	43	48	49	44	45	S	SW	S	SW	0.19	0.19	0.19	0.19	0.19	0.19	0	0	0	19			
20	30.0	30.0	30.0	30.0	44	44	44	44	46	44.5	46	44	S	SW	S	SW	0.31	0.31	0.31	0.31	0.31	0.31	0	0	0	20			
21	30.0	29.6	29.6	29.6	44	44	44	44	45	44	42	40.5	W	NW	W	NW	0.31	0.31	0.31	0.31	0.31	0.31	0	0	0	21			
22	29.6	29.2	29.2	29.2	39	39	39	39	45	44	42	40.5	W	NW	W	NW	0.33	0.33	0.33	0.33	0.33	0.33	0	0	0	22			
23	29.8	29.8	29.8	29.8	39	39	39	39	40.5	38.5	40	39	S	NW	S	NW	0.40	0.40	0.40	0.40	0.40	0.40	0	0	0	23			
24	29.1	29.5	29.5	29.5	40	40	40	40	43	38.5	41	41	NW	S	NW	S	0.53	0.53	0.53	0.53	0.53	0.53	0	0	0	24			
25	29.1	29.6	29.6	29.6	40	40	40	40	45	42.5	41	41	Variable	Variable	Variable	Variable	0.40	0.40	0.40	0.40	0.40	0.40	0	0	0	25			
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INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS

Thorshavn
Feb. 1861

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Mr ALEXANDER BUCHAN

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK-POST.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

SHRUBS, ETC.	First in blossoms.	FRUITS.	First in blossoms.	MIGRATION BIRDS.	First in	DEPARTMENT
Barberry,						
Boultree or Elder,						
Broom,						
Cuckoo,						
Cultew,						
Black Currant,						
Cherry,						
House-Swallow,						
Gean,						
Lapwing,						
Gooseberry,						
Plover,						
Holly,						
Hawthorn,						
Hazel,						
Bronm,						
Cherry,						
House-Swallow,						
Cultew,						
Black Currant,						
Apple,						
Crake,						
Starling,						
Plum,						
Sparrow,						
Strawberry,						
Rail or Corn Crake,						
Mouratin Ash or Rowan,						
Red Flowering Current,						
Biodendron Ponticum,						
Whin,						

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glasgow, County of Glasgow, in Lat. 55° 52', Long. 6° 45' 8", Distance from Sea no miles. 20 feet

Height of Cistern of the Barometer above Mean Sea-level feet, above Ground 5 feet.

During the MONTH of March 1864.

The Hours of Observation are not of Greenwich Time.

ELECTRICITY.	Day of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER. No. 841-92				WIND.				RAIN.				CLOUDS.				THERMOMETERS under Ground.				GENERAL REMARKS.	Days of Month.		
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of it fell.		Amount in inches.		Velocity (0-10), and Direction.		Velocity (0-10), and Direction.		Amount (0-10), and Species.		Hours.		SUNSHINE.		As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.	
		Barometer. No. 91	Attached Thermometer.	Barometer. No. 91	Attached Thermometer.	Max. Sun's rays No. 165	Min. Sun's rays No. 203	Min. on Grass. No. 165	Min. on Grass. No. 203	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	No. 961	No. 961	(0-10), and Species.	(0-10), and Species.	(0-10), and Species.	(0-10), and Species.	No. 3 inches.	No. 12 inches.	No. 22 inches.	Temperature at 9 A.M. 9 P.M.	Temperature at 9 A.M. 9 P.M.					
1	30.2	30.2	—	—	40	—	45	42.5	45	43	3	SW	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1				
2	30.3	30.3	—	—	44	—	44	40	48	44	3W	SW	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2				
3	30.4	—	—	—	—	—	49	48	—	—	SW	SW	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3				
4	30.4	30.4	—	—	35	—	38.5	36.5	34.5	31.5	Calm	Calm	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4				
5	30.4	30.4	—	—	39	—	43	41	41	39.5	N	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5				
6	30.5	30.4	—	—	34	—	41	39	40.5	38.5	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6					
7	30.4	30.4	—	—	34	—	39	38.5	38	37	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7					
8	30.4	30.4	—	—	34	—	39	38	39	37	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8					
9	30.4	30.4	—	—	36	—	38.5	36	38	37	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9					
10	30.4	30.4	—	—	26	—	29	28	28.5	27	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10					
11	30.4	30.4	—	—	29	—	30.5	30	30.5	29.5	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11					
12	30.4	30.4	—	—	28	—	32	31.5	31	30	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12					
13	30.2	30.1	—	—	28	—	34	32.5	30	29.5	W	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13					
14	30.1	30.1	—	—	22	—	24	22.5	22	22	N	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14					
15	30.0	30.0	—	—	21	—	22	22	22	21.5	N	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15					
16	30.1	30.3	—	—	19	—	28.5	28	22	22	NE	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16					
17	30.1	30.1	—	—	19	—	34	34	28	28	S	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17					
18	30.126	45	30.014	43	17	—	26.5	25.5	23	22	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18					
19	30.018	49	30.014	42.5	21	—	25	24.5	22.5	22	NE	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19					
20	29.955	50	29.812	44.5	22	—	31	31	35	33	E	W	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20					
21	30.046	39.4	30.110	40.5	19	—	20	19.5	20	20	N	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21					
22	30.066	43	30.058	42	19	—	29	28.5	35	35	E	SE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22					
23	30.030	44	29.746	43	32	—	36.5	33	34	34	SE	SE	0.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—	23					
24	29.970	45	29.140	45	21.5	—	46	41	27.5	46	39.5	39	NE	NE	0.40	—	—	—	—	—	—	—	—	—	—	—	—	—	24				
25	29.942	44.5	29.142	44.5	40	—	41	40.5	41	41	Calm	Calm	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25					
26	29.940	49.5	28.946	50	44	38	43	42	39.5	39	SE	SE	0.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26					
27	26.934	50	29.072	51	46	36.5	42	41	41.5	40	Calm	Calm	0.14	—	—	—	—</td																

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS

WITH REMARKS ON THE USE OF INSTEINVENTS

inevitably fail in achieving one of the main objects of Meteorological Observation.

Hour of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway Time only) twice a-day for some, and once (morning or evening) for other instruments, as specified, in the following remarks, or at the top 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 at what time it was taken, if not at 9 o'clock.

Barometer.—*Weather glasses* and *Aneroids*, though admirably adapted, as the latter certainly are, to indicate variations of atmospheric pressure, are not well fitted for scientific purposes. Nor can any Barometer be used for Meteorological Observations that is not supplied with such means of *adjustment* or *compensation* as will secure the height of the mercury in the tube being accurately measured from the fluctuating surface of the mercury in the cistern. It is also necessary that every Barometer shall have been compared with a *Standard*.

Two moderate-priced Barometers have been approved by the Council; if properly tested and attended to, they are both well adapted to Meteorological purposes.

An excellent Barometer is constructed by Mr Adie of London, the use of which is attended with the great convenience of requiring no *adjustment* of the cistern. Its *scale-inches* are not true inches but so much shorter as to *compensate* the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This form of instrument has been adopted by the Board of Trade.

Board of Trade, and has received the approval of the Meteorological Committee of the British Association. In another form of the Barometer, the sides of the *cistern* are of leather, and thus, by aid of a screw acting on the bottom, the surface of the contained mercury can be adjusted to the *zero-point* of the fixed scale; their coincidence being indicated by a little ivory float, whose stem passes freely through the lid and case of the cistern. When the *index-line* on this little piston-rod is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this *preliminary setting* must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the *vernier*.

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must be screwed so as to form a tight plug to the cistern. Then screw up the mercury to within a quarter of an inch of the top of the tube, and take down the instrument; it may 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 when, on inclining the instrument so that the mercury strikes the top of the tube, a sharp tap is produced. If this is prevented by air it may be removed to the cistern, and got rid of, by inverting the Barometer (care being taken to prevent the loss of mercury by tightening the ivory peg), and gently tapping it; and if this plan fails, the instrument must be repaired.

The Barometer should be suspended in a good *light*, which may be improved by putting a piece of white paper behind the tube. It must be perfectly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire.

In *taking an Observation*, the attached Thermometer is first noted: the tube must then be gently tapped and the cisternal adjustment carefully made. By raising and lowering the eye, 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 to form exactly a tangent to the convex surface of the mercury in the tube.

or 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 greatly facilitate an accurate adjustment and reading of the Barometer.

Protection of Thermometers.—The Council of the Society recommend that Self-registering Thermometers and Hygrometers be enclosed in a Box, painted white outside, and black within, and fixed 4 feet above grass in an exposed position, free from merely local influences. The laths forming the sides and doors of the Boxes are arranged so as at once to "protect" the Thermometers, and to allow a complete ventilation of the interior. The instruments are suspended on cross-laths, in the centre of the Box, and face the door opening to the north. To accommodate a duplicate set of instruments, which is most desirable, floors are also made to open to the south. These Boxes may be had at the Society's Office.

Self Registering Thermometers.—Professor Phillips^s, and Negretti and Zambra's Patent "*Maxim'm*" Thermometers are recommended : printed directions for their use may be obtained

with each instrument. The "*Minimum*" Thermometer of Rutherford is recommended when graduated on the glass stem only, and affixed to a frame separate from the "*Maximum*." This Thermometer is liable to two derangements, both of which must be guarded against, and may be easily remedied by an observer. When the *column* of spirit breaks, it may be re-united by striking the instrument repeatedly against the palm of the hand; when the part of the spirit distils by high temperature, it will be found in the upper lobe, and must be dislodged from thence by heating that part over a lamp; the alcohol will evaporate and again contract in contact with the body of the liquid. These instruments should be hung horizontally.

The above remarks apply equally to the Thermometers for

Mr ALEXANDER BUCHAN

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

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

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Forthbank, Fife, County of _____, in Lat. $56^{\circ} 15'$, Long. $6^{\circ} 43' 8''$, Distance from Sea no miles. (20 feet)

Height of Cistern of the Barometer above Mean Sea-level 20 feet, above Ground 5 feet.

During the MONTH of April 1867.

The Hours of Observation are not of Greenwich Time (un certain).

BUREAU NO.	Days of Month	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER. No. 631-32				WIND.				RAIN.		CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.				GENERAL REMARKS.	Days of Month				
		9 h. A.M.		9 h. P.M.		Protected in shade, 4 feet above Ground.				Exposed Black Bulbs.				9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	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.	Temperature of WELL. Depth of feet. No.	Temperature at 1 fathom, at and Dusky.	0-10.	9 A.M.
Barometer, No. 91	Attached Thermometer, No. 91	Barometer, No. 92	Attached Thermometer, No. 92	Max. Sun's rays	Min. Sun's rays	Max. in Sun.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	Direction.	Force	No. 91	No. 92	No. 93	No. 94	No. 95	No. 96	No. 97	No. 98	No. 99	No. 100	No. 101	No. 102	No. 103	No. 104	No. 105	No. 106			
1	29,556	52	29,580	53	52	44	49	46.5	45	44	W	1.94																				1		
2	29,526	56	29,510	54	50	38	45.5	43.5	39	38	W	0.50																				2		
3	29,514	52.5	29,568	49.5	45	35.5	59.5	54.5	38	36.5	N.E.	3.2	0.55																			3		
4	29,514	51	29,525	46.5	44	36	40.5	39	43	41.5	N.E.	2.94	0.43																		4			
5	29,404	50	29,606	48.6	49	33	38.5	38	45	33.3	Calm	0.45																			5			
6	29,514	44	29,510	43	35	30	32.5	31.5	33	32.5	N.E.	2.01	0.44																		6			
7	29,622	44	29,168	46	44	35	35.5	35	40	42.5	N.E.	3.2	0.99																		7			
8	29,558	51.5	29,126	48	44	36.5	41.5	41	38.5	36.5	N.E.	1.61																		8				
9	29,538	47	29,616	46.5	45	32.5	40	36	34	32.5	N.E.	0.53																		9				
10	29,684	49	29,544	44.5	40.5	31.5	33.5	32	33	32.5	N.E.	-																		10				
11	29,586	48.8	29,966	45	40	32	37	33.5	35	32	N.E.	-																		11				
12	29,440	45	29,914	44.4	45	34	40	38	42	40	S	1.60																		12				
13	29,188	52	28,486	52	45	39	42	40	42	41	W	1.21																		13				
14	28,106	56.5	28,666	54	49.5	30.5	41	44	35	31.5	S.W.	0.54																		14				
15	29,026	50	29,192	48.4	50	33	38	34	36.5	33	N	-																		15				
16	29,144	49	29,252	48.3	42	33	37	34.5	36	33.5	S.W.	0.42																		16				
17	29,614	47	29,116	46.4	42	36	40.5	39	40.5	39.5	N.E.	0.42																		17				
18	29,452	52.6	29,104	47.8	43	38	40	39	40.5	39.5	N.E.	1.54																		18				
19	29,308	44.9	29,108	48.4	45.5	39	43	41	41	41	S	0.42																		19				
20	28,968	48.3	29,106	53	47	39	44.5	42.5	41.5	41	N.E.	0.44																		20				
21	29,452	49.1	29,612	48	42	34	40	46	44.5	43	N.E.	0.09																		21				
22	29,114	49.5	29,164	44.4	44.5	34.5	46.5	45	46	35	N.E.	-																		22				
23	29,152	50	29,516	46.4	45	35	38.5	38	35	35	N.E.	-																		23				
24	29,006	49	30,068	49	40	30	35	33.5	31	30.5	N.E.	-																		24				
25	29,006	45.5	29,492	49	42	34	45	34	35	34	Calm	0.45																		25				
26	29,690	49.1	29,514	48.5	44	34	41	39.5	43	42	S.E.	0.12																		26				
27	29,630	50	29,676	49.4	45	42	43	41.5	43.5	42	S.E.	1.40																		27				
28	29,706	48.3	29,594	49.5	45	41	43	41	43.5	43	Calm	1.53																	28					
29	29,312	51.3	2																															

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

ONE of the objects of immediate importance that the "Scottish Meteorological Society" has proposed to itself, is to secure a from a radiation during night. Their bulbs have a black coating, amount of cloud will be found on the other side. The perfect uniformity in the system of observation pursue at all its which may easily be made, or mended by the application of a greater or less obscuration of the sky *overhead* (i.e., within Stations. A certain degree of uniformity is absolutely necessary to justify the publication of Monthly Results from different shallow blackened boxes, whose sides protect the bulb from the horizon are viewed obliquely; animals, being unable to judge observations; and it is found that differences between the wind. The "Minimam" should be freely exposed to the sun, of their amount, we ought not to take them into account in the Returns from any two Stations, so that the "Minimam" should rest on wooden supports a few *clouds* column, though their appearance and changes ought to render them quite incomparable, any cause from dissimilarity in the position or shelter of instruments, different hours of snow must not be allowed to cover either of these Thermometers; the tube ought to be tested once a year in snow or melting ice. For comparison of Thermometers a properly tested Thermometer used for Meteorological purposes till it has been carefully observed from their position on the Seine, and ought never afterwards to be used, without being *re-tested*. The self-registering, especially the "Minimam," Thermometers ought frequently to be compared with the dry bulb of the Hygrometer. The freezing-point of each Thermometer (marked by a scratch on time only) twice a day for some, and once (morning or evening) for other instruments, as specified in the following remarks, or at the top 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 at what time it was taken, if not 9 o'clock.

Barometer. — *Weather glasses* and *aneroids*, though admirably adapted, as the latter certainly are, to indicate variations of atmospheric pressure, are not well fitted for scientific purposes. One form of "Minimam" Hygrometer is highly objectionable. The frame of the Thermometers is enclosed in a tin case, which is not supplied with such means of *adjustment*; *compensation* as will secure the height of the mercury in the tube being accurately measured from the fluctuating surface of mercury covered, and placed to the side, and a little below the level of the sun's rays, and fitted with sloping tin collars, to prevent rain-water falling into the tube; — the muslin must be of wetting conveyed to the bulb by the stems or wooden frames, which also supplies it with water. It must be seen to the bottom of wells, when practicable, to the taken, and the placed.

Temperature of the Sea. — A knowledge of the temperature of the sea is not only in itself, but in its relations in that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be carefully taken by a properly constructed apparatus, from the ends of crops and plants greatly depend on the temperature of the soil; — its amount and constancy — the Council recommend that observations in this interesting department be made at 9 A.M. by the piers and rocks round the coast, where it is not influenced by the sun's rays, and the stems above ground projected from the sea-shore, should be entered in the proper column.

Underground Thermometers. — As the germination and health of crops and plants greatly depend on the temperature of the soil, — the Council recommend that the thermometer be made at 9 A.M. by the piers and rocks round the coast, where it is not influenced by the sun's rays, and the stems above ground projected from the sea-shore, should be entered in the proper column.

Sunshine. — The number of hours in which objects in the sun's rays cast shadows, should be entered in the proper column. The sun's rays, and the stems above ground projected from the sea-shore, should be entered in the proper column.

Underground Thermometers. — As the germination and health of crops and plants greatly depend on the temperature of the soil, — its amount and constancy — the Council recommend that observations in this interesting department be made at 9 A.M. by the piers and rocks round the coast, where it is not influenced by the sun's rays, and the stems above ground projected from the sea-shore, should be entered in the proper column.

Hygrometer. — The temperature of the water at the bottom of wells ought, when practicable, to be taken, and the depth of the well and of the water therein.

Ozone. — Mention whether Schönen's or Moffat's papers are used. The paper is affixed by a pin to a board in the thermometer, and the indication registered at 9 A.M. and 9 P.M. The use of contractions ought, therefore, to be taken every afternoon, and a list of such as are recognised and in use at Greenwich, and Southampton, are given at the foot of the column. Besides special and extraordinary observations great prominence is given to the ozone paper is tried as 23°.

Electricity. — Too much importance cannot be attached to the force and direction of the wind at the time of observation. The wind is 4°; i.e., it is *drawing fresh*.

Temperature of Wells. — The temperature of the water at the bottom of wells ought, when practicable, to be taken, and the depth of the well and of the water therein.

Temperature of the Atmosphere. — A knowledge of the temperature of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper thermometer is necessary to every complete meteorological observatory.

Remarks. — The "Remarks" column is too narrow, but unavoidable so. Some of the most valuable observations that can be taken are those for which no rates can be given nor hours assigned. The use of contractions ought, therefore, to be taken every afternoon, and a list of such as are recognised and in use at Greenwich, and Southampton, are given at the foot of the column. Besides special and extraordinary observations great prominence is given to the ozone paper is tried as 23°.

Wind. — A wind-vane ought to be elevated 12 feet at least above surrounding objects. When it oscillates incessantly, the origin to be made at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different stations, would be likely to give highly interesting and important results.

The Council would strongly recommend that every observer should be entitled to the periodic return of the "Remarks" column, and to the use of observations in connection with the periodic return of the "Wind." The "Wind" column is too narrow, but of considerable interest to the Agriculturalist. The Council would direct the special attention of Observers to the registration of such phenomena; that the published Summaries may fairly represent the whole of Scotland. Observation 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.

Observations in Connection with the Periodic Return of the "Wind." — These observations, however, do not only great scientific value, but are of considerable interest to the Agriculturalist. The Council would direct the special attention of Observers to the registration of such phenomena; that the published Summaries may fairly represent the whole of Scotland. Observation 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.

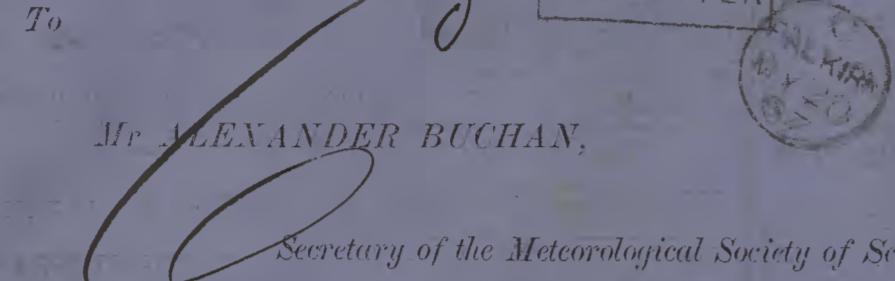
Wind. — The Council have agreed to recommend that Observers, before purchasing new instruments, should communicate with the Meteorological Secretary; and they consider it desirable that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

The above remarks apply equally to the Thermometers mentioned in the Schedule, — Convenient abbreviations for Luke Howard's

To
Mr. ALEXANDER BUCHAN,
Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK-POST.



SHIP LETTER



These prefaces among others: and the like, may be able to collect relative to the Crosses of Graham, Hay, Peacocke, Turner, Price, etc., whether pertinient, or not, to the particular condition of the district generally.

Have the goodness also to state any information you may be able to collect relative to the Crosses of Graham, Hay, Peacocke, Turner, Price, etc., whether pertinient, or not, to the particular condition of the district generally.

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Turner, Price, etc., whether pertinient

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Thurso, County of _____, in Lat. $62^{\circ} 24'$ Long. $6^{\circ} 43' 8''$, Distance from Sea 10 miles.

Height of Cistern of the Barometer above Mean Sea-level 20 feet, above Ground 5 feet.

During the MONTH of May 1867.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.		SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER, No. 541-12				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA. S _o <small>at Depth of Well in feet, No. 10.</small>	OZONE.	GENERAL REMARKS.		Days of Month.		
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.		Readings of the H. On Anemometer No. 9351		9 A.M.		P.M.		9 h. A.M.		SUNSHINE.				
		Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Max.	Min.	No. 541	No. 522	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	Direction.	Force	No. 9351	No. 9351	Velocity (0-6) and Direction.	Amount (0-10) and Species.	Velocity (0-6) and Direction.	Amount (0-10) and Species.	Hours.	No. 3 inches.	No. 12 inches.	No. 22 inches.	As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevailing Diseases, etc.				
1	1	30.092	52.5	30.104	44.5	45.5	35			42	34.5	41	37	N.E.		N.E.				-					0	0	0					
2	2	30.128	48	30.190	44	44	36			41.5	37	38	37	N.E.		N.E.				0.06												
3	3	30.208	56.7	30.246	51.3	49	36			41.5	42	39	36.5	N.E.		N.E.				0.02												
4	4	30.244	52	30.248	49	47	31			43	41	42.5	40	N.E.	C					-												
5	5	30.118	48	30.058	48	44	39			41	30.5	42	31.5	N.E.		N.E.				2.10												
6	6	29.458	51	29.724	51.5	50	41			44	43.5	50	47	N.E.		S.W.				0.11												
7	7	29.710	55.5	29.906	56	56	42			51	48	45.5	43	S.W.	S.W.					-												
8	8	30.074	61.5	30.152	57	55	41			49	43	44	42	W	E					-												
9	9	30.136	56	30.174	52.5	54	39.5			45.5	39.5	41	39.5	E	S.E.					-												
10	10	30.180	53.5	30.124	48.5	45	40			44	40	41.5	38	E	E					0.19												
11	11	30.082	46.5	30.038	45	42	36			40	34.5	40	36	E	E					-												
12	12	30.070	44.5	30.134	45.5	40	34.5			39	36.5	38	35	N.E.	N.E.					-												
13	13	30.192	52.5	30.210	48	44	34			40	36.5	38	35.5	N.E.	N.E.					-												
14	14	30.146	48.5	30.208	50	43	35.5			41	38.5	40	37	N.E.	N.E.					-												
15	15	30.232	57.5	30.270	50.5	45	34			43	38.5	36	34	N.E.	N.E.					-												
16	16	30.252	52.5	30.190	47.5	45	34			38.5	36.5	40	36	E	E					-												
17	17	30.132	54	30.126	51.5	43	36			40	38	38	34.5	N.E.	N.E.					0.04												
18	18	29.646	50	30.152	50	41	36			37	36	40	34.5	E	E					0.30												
19	19	29.460	58	30.224	58	48	38			41	43	41.5	38	S.E.	S.E.					0.03												
20	20	30.256	57	30.304	50	45	35			42	34.5	40	35.5	S.E.	S.E.					0.02												
21	21	30.347	57.5	30.402	51.5	44	37			42	38	41	34.5	N.E.	N.E.					0.02												
22	22	30.452	51	30.456	55	51	32			46.5	41.5	41	29.5	N.E.	N.E.					0.04												
23	23	30.366	57.5	30.329	56.5	51.5	40			46	42.5	45	43	S.W.	S.W.					-												
24	24	30.210	58.5	30.242	56	52	34			48	46	43	41	W	W					0.04												
25	25	30.262	51	30.242	55.5	48	41.5			46	45	44	43	N.E.	N.E.					-												
26	26	30.146	56.5	30.021	52.5	53	41			44	42	43	40.5	N.E.	E					-												
27	27	29.899	53	29.970	52.5	48	44			49.5	41.5	44	32.5	N.E.	E					0.04												
28	28	29.670	51	29.652	50.5	45	43			45	44.5	44	33.5	E	E					0.75												
29	29	29.596																														

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS

Wind.—A wind-vane ought to be elevated 12 feet at least above surrounding objects. When it oscillates incessantly, the mean direction must be taken; and when it is stationary, and always when the wind is feeble, reference must be made to the direction of the lower strata of clouds overhead, and to the direction of smoke, etc.

Careful observations ought to be made on the changes in the direction of the wind; and during storms, extra observations ought to be made at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, would be likely to give highly interesting and important results.

The Council would strongly recommend that every observatory be furnished with a Hemispherical-Cup Anemometer,—a self-registering instrument which shows the amount of Wind that passes it per day; from which also the 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, Lind's Anemometer is also recommended; the method of *Establishing* Wind Force by such tables as that given in the schedule is, to say the least, unsatisfactory.

Rain-gauges.—Many causes conspire to produce anomalies in rain returns. They arise, partly, from unfavourable situation of instruments, and partly from the defective nature of the instruments used. It is, indeed, difficult to obtain an unexceptionable position for the rain-gauge; but in all cases the gauge must be sunk in the ground till its edges are on a level with the close cut grass around its mouth. The rain-gauge ought to be read daily, and the readings entered in the returns on the day on which the rain fell.

Snow-falls may, *for convenience*, be registered in the rain columns, under the following conditions:—when a Snow shower occurs, it must 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 one place, whose name is to be affixed to the instrument repeatedly against the palm of the hand; when

Besides special and extraordinary observations, great prominence ought to be given in this column to prevalent diseases, differences in character, colour, velocity, and direction between the lower and upper strata of clouds, the colour of the sky, etc. Remarks ought to be made on the occurrence of meteors, auroræ boreales, remarkable depressions and elevations of the barometer, thunder storms, and remarkable falls of snow, hail, or rain, the hour of storms as have been hinted at above. When lofty hills are in the vicinity of an Observatory, the height of clouds and of the snow-line in winter ought to be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. ought to be registered, either in two columns, otherwise unoccupied, or in two ruled off for the purpose, from that headed “Remarks.” It is intended that observations by the Electrometer should be entered in this manner or on the side-margin. Additional remarks may be made on the margin.

“Observations in connection with the periodic return of the seasons,” possess not only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena; that the published Summaries may fairly represent the whole of Scotland. Observation 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 Council recommend that *term day* observations be taken; —viz., on the 21st days of March, June, September, and December.

Full directions for the use of the instruments mentioned above have been printed, and may be had along with them from the makers.

The Council have agreed to recommend that observers, be-

Shankar (86)

To

Mr ALEXANDER BUCHAN

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK-POST

Secretary of the Meteorological Society of Scotland,

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

To
Mr.

BOOK-POST.

The Meteorological Society has proposed to itself, is to secure a perfect uniformity in the system of observation pursued at all its Stations. A certain degree of uniformity is absolutely necessary to justify the publication of Monthly Results from different observations; and it is found that differences between the Returns from any 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 persons 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 which

amount of cloud in the atmosphere ought to be estimated from the greater or less obscuration of the sky *overhead* (*i.e.*, within 20° or 30° of the zenith). The strata of clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the clouds' column, though their appearances and changes ought to be noted among the *Remarks*. The amount of cloud is entered from a scale of 0 to 10; thus, when the sky *overhead* is *half covered* by clouds, 5 is entered as the *observation*, 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:—In the column “Velocity

of Thermometers.”—No instrument ought to be used for Meteorological purposes till it has been carefully tested by comparison with a *Standard Thermometer*. When such

SHIP LETTER

ical Society of Scotland,

EDINB.

that is not supplied with such means of *adjustment or compensation* as will secure the height of the mercury in the tube being accurately measured from the fluctuating surface of the mercury in the cistern. It is also necessary that every Barometer shall have been compared with a *Standard*. Two moderate-priced Barometers have been approved of by the Council; if properly tested and attended to, they are both well adapted to Meteorological purposes.

An excellent Barometer is constructed by Mr Adie of London, the use of which is attended with the great convenience of requiring *no adjustment* of the cistern. Its *scale-inches* are not true inches but so much shorter as to *compensate* the error that would

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 placed to the side, and a little below the level of the wet bulb,—in no case under the bulbs;—the muslin must be of medium fineness, and fastened at the neck of the bulb by the cotton, which also supplies it with water. It must be seen to by the observer that the muslin is always *clean and moist*, and 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*.

Temperature of the Sea.—A knowledge of the temperature of the sea is not only in itself, but in its relations to that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be care-

22

BURGH.

will proceed as from the moist cloth in ordinary circumstances. One form of "Mason's" Hygrometer is highly objectionable. The frame of the Thermometers is enclosed in a tin case, which also supports the water cup underneath. This arrangement must be immediately altered by pulling the boxwood frame out of the tin case, and hanging them side by side, so that the aforementioned requirements shall be complied with, as far as possible.

Reading of the Thermometer.—Great care must be taken to avoid the effects of refraction, by bringing the eye exactly opposite the tip of the index or column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus the Thermometer will be read $-39^{\circ}.9$, $40^{\circ}.0$, or $40^{\circ}.1$; or $40^{\circ}.4$, $40^{\circ}.5$, or $40^{\circ}.6$.

Temperature of Wells.—The temperature of the water at the bottoms of wells ought, when practicable, to be taken, and the depth of the well and of the water noted.

ALL RETURNOF THE S MIGRATORY BIRDS.			
	Sowing or Planting	Aप्पेण्टिंग above Ground	
Cuckoo,			
Cuckoo,			
Gulliver,			
House-Swallow,			
Lapwing,			
Plover,			
Sand-Martin,			
Starling,			
Swan,			
Bull or Corn Crake,			

CONNECTIONS IN CONNECTION			
Fruit	First in blossom.	In Leaf.	Leaf Buds first appear.
Apple.			
Black Currant.			
Cherry.			
Green.			
Gooseberry.			
Pear.			
Plum.			
Strawberry.			

OBSERVATION	
FOREST TREES.	
Alder;	Sycomore or Plane,
Ash;	Oak,
Beech;	Lime,
Birch;	Larch,
Elm,	Hazel,
Beech,	Hoary,
Barberry;	Laburnum,
Boultree or Elder,	Lilac,
Broom,	Mezereon,
Hazel,	Meadow Ash or Row-
Briony,	Red Flowering Currant
Burberry,	Mountain Ash or Holly
SHRUBS, ETC.	
Barberry,	Hawthorn,
Broom,	Heather,
Hazel,	Heather,
Briony,	Holly,
Boultree or Elder,	Laburnum,
Barberry,	Lilac,
Broom,	Mezereon,
Hazel,	Meadow Ash or Holly
Briony,	Red Flowering Currant
Burberry,	Mountain Ash or Holly
FOLIAGE	
Elm,	Elm,
Beech,	Beech,
Ash;	Ash,
Beech,	Beech,
Alder;	Alder;
FOREST TREES.	
Alder;	Sycomore or Plane,
Ash;	Oak,
Beech;	Lime,
Birch;	Larch,
Elm,	Hazel,
Beech,	Hoary,
Barberry;	Laburnum,
Boultree or Elder,	Lilac,
Broom,	Mezereon,
Hazel,	Meadow Ash or Holly
Briony,	Red Flowering Currant
Burberry,	Mountain Ash or Holly
SHRUBS, ETC.	
Barberry,	Hawthorn,
Broom,	Heather,
Hazel,	Heather,
Briony,	Holly,
Boultree or Elder,	Laburnum,
Barberry,	Lilac,
Broom,	Mezereon,
Hazel,	Meadow Ash or Holly
Briony,	Red Flowering Currant
Burberry,	Mountain Ash or Holly

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glencairn, County of Perth, in Lat. $62^{\circ} 2' N$, Long. $6^{\circ} 43' E$, Distance from Sea one miles.

Height of Cistern of the Barometer above Mean Sea-level 90 feet, above Ground 5 feet.

During the MONTH of July 1867.

The Hours of Observation are 9 A.M. 9 P.M. Greenwich Time [London]

ELECTRICITY. Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER. No. 141-42				WIND.				RAIN.		CLOUDS.				THERMOMETERS, under Ground.				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 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.		Rain.		9 A.M.		P.M.		9 h. A.M.		SUNSHINE.		SEA. 830		OZONE.						
	Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	No. 165	No. 234	No. 165	No. 234	Max. in Sun's rays	Min. in Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	Direction.	Force	No. of hours in which it fell.	No. 141-42	Amount in inches.	Velocity (0-10), and Direction.	Amount, (0-10), and Species.	Velocity (0-6), and Direction.	Amount, (0-10), and Species.	Hours.	No. 3 inches.	No. 12 inches.	No. 22 inches.	Temperature of WELL in Depth of feet.	No.	Temperature at 1 fathom, and Density.	0-10.		
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1	30.016	54.6	30.032	54.8	52	38	41	41.5	44	41.5	N	W	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
2	29.978	54.7	30.020	56.4	53	39.5	47	44	46.5	43	W	W	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	
3	30.066	59.5	30.066	55.2	55	37	49.5	45	47	44	NE	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3		
4	29.861	52.3	29.904	54	57	45	47.5	46	47	46.5	E	E	12	2.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4		
5	29.708	55.4	29.984	54.4	54.5	46	49	47	48	45.5	NE	N	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5			
6	30.170	53.8	30.214	54.4	52.5	43	47.5	43	44	41	N	N	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6			
7	30.321	57.4	30.362	56	56	41	55	47	46	43	N	SW	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7				
8	30.216	56.5	30.110	56	56	40	46	43.5	55	54	S	SW	0.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8				
9	30.126	58.1	30.164	60.5	60	53.5	57.5	56	56	55.5	SW	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9					
10	30.110	58.5	30.224	59	60.5	50	52.5	51.5	50.5	49	SW	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10					
11	30.250	59	30.112	59.4	62	49	54	51	50	49.5	SW	0.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11					
12	29.966	57.4	29.908	54.3	60	56.5	56	49.5	54	50.5	NE	W	0.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12				
13	29.960	57.5	29.968	58	60	48	51.5	57	49	48.5	Calm	Calm	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13				
14	29.946	57.4	29.932	61.5	60	47.5	56	54	50.5	49.5	E	E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14					
15	29.844	60	29.808	60	60	47.5	59	56	57	50.5	Calm	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15					
16	29.736	59.6	29.712	58	60	49.5	50.5	50	52	50	NE	E	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16				
17	29.602	59.8	29.656	60	60	47	55	52.5	51	50	E	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17					
18	29.712	56	29.805	56	57	46	49	47	44	46	E	E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18					
19	29.826	54	29.916	56.1	57	44	49	45	47	44	NE	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19					
20	29.788	55.8	29.740	56	56	43	51	46.5	49	45	N	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20					
21	29.636	53	29.644	53	55	48	53.5	50.5	52	48.5	N	N	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21					
22	29.644	54	29.680	54.5	57	56.5	46	42	44.5	42.5	N	N	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22				
23	29.750	53.5	29.844	55.5	53	41	46.5	43.5	44	41.5	NE	NE	—																						

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS.

ONE of the objects of immediate importance that the "Scottish Meteorological Society" has proposed to itself, is to secure a *perfect uniformity* in the system of observation pursued at all its stations. A certain degree of uniformity is absolutely necessary to justify the publication of Monthly Results from different observations: and it is found that differences between the returns from any 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 persons 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 Meteorology.

registering the greatest heat from the sun's rays, and the least from radiation during night. Their bulbs have a black coating, which may easily be made, or mended, by the application of a mixture of lamp black and printer's ink. They are placed in shallow blackened boxes, whose sides protect the bulbs from the wind. The "Maximum" should be freely exposed to the sun, and the "Minimum" should rest on wooden supports a few inches from the surface of the grass, in an open situation. Snow must not be allowed to cover either of these Thermometers; nor the sun's heat to affect the Minimum Thermometer by distillation.

Verification of Thermometers.—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,

rical Observation.

Hour of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway time only) twice a-day for some, and once (morning or evening) for other instruments, as specified, in the following remarks, at the top 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 at what time it was taken, if not at 9 o'clock.

Barometer.—*Weather glasses* and *Aneroids*, though admirably adapted, as the latter certainly are, to indicate variations of atmospheric pressure, are not well fitted for scientific purposes. Nor can any Barometer be used for Meteorological Observations that is not supplied with such means of *adjustment* or *compensation* as will secure the height of the mercury in the tube being accurately measured from the fluctuating surface of the mercury in the cistern. It is also necessary that every Barometer shall have been compared with a *Standard*.

Two moderate-priced Barometers have been approved by the Council; if properly tested and attended to, they are both well adapted to Meteorological purposes.

An excellent Barometer is constructed by Mr Adie of London,

and especially the "*Minimax*," 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. For comparison of Thermometers, a properly tested Thermometer may be had, on loan, by any observer, from the Meteorological Secretary.

The *Hygrometer* consists of two Thermometers usually, but not necessarily, mounted on one frame. As apparently slight deviations from the approved and *well-tested form* of this apparatus seriously vitiate the "Hygrometrical Deductions," Observers, are specially requested to attend to the following conditions:—The bulbs must *hang down* by at least an inch free from the scales and frame to which they are attached;—the frame must be such as will bring the tubes forward by an inch, from any board on which it may be suspended; the water-cup must be covered, and placed to the side, and a little below the level of the wet bulb,—in no case under the bulbs;—the muslin must be of medium fineness, and fastened at the neck of the bulb by the cotton, which also supplies it with water. It must be seen to by the observer that the muslin is always *clean* and *moist*, and the water pure. In frosty weather observation is a matter of much delicacy, and must be made with great care. The bulb must be

the use of which is attended with the great convenience of requiring *no adjustment* of the cistern. Its *scale-inches* are not true 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 form of instrument has been adopted by the Board of Trade, and has received the approval of the Meteorological Committee of the British Association. In another form of Barometer, the sides of the *cistern* are of leather, and thus, by means of a screw acting on the bottom, the surface of the contained mercury can be adjusted to the *zero-point* of the fixed scale; their coincidence being indicated by a little ivory float, whose stem passes freely through the lid and case of the cistern. When the *index-line* on this little piston-rod is brought, by the adjusting screw, to form one *straight line* with those on its *ivory frame*, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this *preliminary setting* must be made with scrupulous accuracy; as a slight error will vitiate the readings from the *vernier*.

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must be screwed so as to form a tight plug to the cistern. Then screw up the of the mercury or alcohol is alone noted. Readings of the

ercury to within a quarter of an inch of the top of the tube, and take down the instrument; it may then be carried with the western uppermost. Before suspending the Barometer for use, must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case when, on inclining the instrument so that the mercury strikes the top of the tube, a sharp tap is produced. If this is prevented by air it may be removed to the cistern, and got rid of, by inverting the barometer (care being taken to prevent the loss of mercury by glistening the ivory peg), and gently tapping it; and if this is necessary to refer their occurrence to their proper meteorological periods.

The Barometer should be suspended in a good *light*, which may be improved by putting a piece of white paper behind the tube. It must be perfectly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire.

In taking an *Observation*, the attached Thermometer is first inserted: the tube must then be gently tapped and the cistern-assembly carefully made. By raising and lowering the eye, it must be brought into the plane of the back and front of the tube,—usually the lower edge of the vernier, which must be carefully adjusted to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly; as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will greatly facilitate accurate adjustment and reading of the Barometer.

Protection of Thermometers.—The Council of the Society recommend that Self-registering Thermometers and Hygrometers enclosed in a Box, painted white outside, and black within, and fixed 4 feet above grass in an exposed position, free from all merely local influences. The laths forming the sides and doors of the Boxes are arranged so as at once to "protect" the Thermometers and to allow a complete ventilation of the interior.

thermometers, and to allow a complete ventilation of the interior. The instruments are suspended on cross-laths, in the centre of the Box, and face the door opening to the north. To accommodate a duplicate set of instruments, which is most desirable, boxes are also made to open to the south. These Boxes may be seen at the Society's Office.

Self Registering Thermometers.—Professor Phillips's, and Segretti and Zambra's Patent "Maximam" Thermometers are recommended: printed directions for their use may be obtained with each instrument. The "Mininum" Thermometer of Etherford is recommended when graduated on the glass stem and affixed to a frame separate from the "Maximam." This thermometer is liable to two arrangements, both of which must be guarded against, and may be easily remedied by an observer. When the column of spirit breaks, it may be re-united by striking the instrument gently, "against the edge of the hand,"

Rain-gauge.—Many causes conspire to produce anomalies in rain returns. They arise, partly, from unfavourable situation for observation and partly from the defective nature of the instruments used. It is, indeed, difficult to obtain an unexceptionable position for the rain-gauge; but in all cases the gauge must be sunk in the ground till its edges are on a level with the close cut grass around its mouth. The rain-gauge ought to be read daily, and the readings entered in the returns on the day on which the rain fell.

Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—when a Snow shower occurs, it must be noted in the "Remarks," and the letter S affixed to the depth of water received in gauge. The depth of

the instrument repeatedly against the palm of the hand; when part of the spirit distils by high temperature, it will be found in the upper lobe, and must be dislodged from thence by heating the part over a lamp; the alcohol will evaporate and again con-

W. H. Thompson
July 1886

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Mr ALEXANDER BUCHAN

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK-POST

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

registering the greatest heat from the sun's rays, and the least from radiation during night. Their bulbs have a black coating, which may easily be made, or mended, by the application of a mixture of lamp black and printer's ink. They are placed in shallow blackened boxes, whose sides protect the bulbs from the wind. The "Maximum" should be freely exposed to the sun, and the "Minimum" should rest on wooden supports a few inches from the surface of the grass, in an open situation. Snow must not be allowed to cover either of these Thermometers; nor the sun's heat to affect the Minimum Thermometer by distillation.

Verification of Thermometers.—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, and 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 nomenclature of clouds will be found on the other side. The amount of cloud in the atmosphere ought to be estimated from the greater or less obscuration of the sky *or* *head* (*i.e.*, within 20° or 30° of the zenith). The strata of clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the "clouds" column, though their appearances and changes ought to be noted among the "*Remarks*". The amount of cloud is entered from a scale of 0 to 10; thus, when the sky *overhead* is *half covered* by clouds, 5 is entered as the *observation*, 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;—In the column "Velocity and Direction," 6, S. W. and 2, W., (for example,) 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 (*extreme*) speed of the former. Again, in the second "Cloud" 4, st.

the tube) ought to be tested once a year, in snow or melting ice. For comparison of Thermometers, a properly tested Thermometer may be had, on loan, by any observer, from the Meteorological Secretary.

The Hygrometer consists of two Thermometers usually, but not necessarily, mounted on one frame. As apparently slight deviations from the approved and well-tested form of this apparatus seriously vitiate the "Hygrometrical Deductions," Observers, are specially requested to attend to the following conditions:—The bulbs must *hang down* by at least an incli 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 placed to the side, and a little below the level of the wet bulb,—in no case under the bulbs;—the muslin must be of medium fineness, and fastened at the neck of the bulb by the cotton, which also supplies it with water. It must be seen to by the observer that the muslin is always *clean* and *moist*, and 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. One form of "Mason's" Hygrometer is highly objectionable. The frame of the Thermometers is enclosed in a tin case, which also supports the water cup underneath. This arrangement must be immediately altered by pulling the boxwood frame out of the tin case, and hanging them side by side, so that the aforementioned requirements shall be complied with, as far as possible.

Reading of the Thermometer.—Great care must be taken to avoid the effects of refraction, by bringing the eye exactly opposite the face of the instrument, and looking through the glass.

Temperature of the Sea.—A knowledge of the temperature of the sea is not only in itself, but in its relations to that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be carefully taken by a properly constructed apparatus, from the ends of piers and rocks round the coast, where it is not influenced by that of river water. At or near the time of high water, on the 5th, 15th, and 25th of each month, the thermometer ought to be sunk exactly six feet (one fathom), and after ten minutes have elapsed, drawn up and read. 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; and continuing to observe for particular depths.

Temperature of Wells.—The temperature of the water at the bottom of wells ought, when practicable, to be taken, and the depth of the well and of the water noted.

Ozone.—Mention whether Schönbein's or Moffat's papers are used. The paper is affixed by a pin to a board in the thermometer box, and the indication registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the daily observations.

reading Rutherford's "Max." and "Min." Thermometers, the indication of that end of the *index* which is next to the surface of the mercury or alcohol is alone noted. Readings of the Thermometers, especially of the wet and dry *bulbs*, must be rapidly taken, being so readily affected by heat from the person of the observer.

Hour of observing Temperature.—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 3rd are those of a series of phenomena commencing at 9 P.M. on the 2nd, and extending till 9 P.M. on the 3rd.

Wind.—A wind-vane ought to be elevated 12 feet at least above surrounding objects. When it oscillates incessantly, the mean direction must be taken; and when it is stationary, and always when the wind is feeble, reference must be made to the direction of the lower strata of clouds overhead. and to the

with the force and direction of the wind at the time of observation, in the following manner:—thus $\frac{3}{4}$ N.W., 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—6 is "4"; i.e., that it is *blowing fresh*.

Electricity.—Too much importance cannot be attached to electric condition of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper Electrometer is necessary to every complete meteorological observatory.

Remarks.—The "Remarks" column is too narrow, but unavoidably so. Some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are recognised and in use at Greenwich and Southampton, are given at the foot of the column. Besides special and extraordinary observations, great prominence ought to be given in this column to prevalent diseases, differences in character, colour, velocity, and direction between the lower and upper strata of clouds, the colour of the sky, etc. Remarks ought to be made on the occurrence of meteors, aurora boreales

Careful observations ought to be made on the changes in the direction of the wind; and during storms, extra observations ought to be made at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, would be likely to give highly interesting and important results. The Council would strongly recommend that every observatory be furnished with a Hemispherical-Cup Anemometer, — a self-registering instrument which shows the amount of Wind that passes it per day; from which also the 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, Lind's Anemometer is also recommended; the method of Estimating Wind Force by the use of this instrument will be found in the second or third volume of the *Journal of the Royal Society*, and so on direction of smoke, etc.

Careful observations ought to be made on the changes in the direction of the wind; and during storms, extra observations ought to be made at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, would be likely to give highly interesting and important results. The Council would strongly recommend that every observatory be furnished with a Hemispherical-Cup Anemometer, — a self-registering instrument which shows the amount of Wind that passes it per day; from which also the 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, Lind's Anemometer is also recommended; the method of Estimating Wind Force by the use of this instrument will be found in the second or third volume of the *Journal of the Royal Society*, and so on

mating Wnd Force by such tables as that given in the schedule is, to say the least, unsatisfactory.

Rain-gauges.—Many causes conspire to produce anomalies in rain returns. They arise, partly, from unfavourable situation for observation and partly from the defective nature of the instruments used. It is, indeed, difficult to obtain an unexceptionable position for the rain-gauge; but in all cases the gauge must be sunk in the ground till its edges are on a level with the close cut grass around its mouth. The rain-gauge ought to be read daily, and the readings entered in the returns on the day on which the rain fell.

Snow-falls may, *for convenience*, be registered in the rain columns, under the following conditions:—when a Snow shower occurs it must be noted in the “Remarks,” and the letter S affixed to the depth of water received in gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the rain-gauge. For wind, rain, and snow, as indeed in every column, the observer cannot be too careful to

“possess not only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena; that the published Summaries may fairly represent the whole of Scotland. Observation 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 Council recommend that *term day* observations be taken; —viz., on the 21st days of March, June, September, and December.

Full directions for the use of the instruments mentioned above have been printed, and may be had along with them from the makers.

The Council have agreed to recommend that observers, before purchasing new instruments, should communicate with the Meteorological Secretary; and they consider it desirable that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

A blue-tinted photograph of a postcard. The postcard has a circular postmark in the top left corner with the text "M. G. A. 67". In the bottom right corner, there is a large, dark, irregular smudge or hole. The main text on the card is: "To Mr. ALEXANDER BUCHAN, Secretary of the Meteorological Society of Scotland, EDINBURGH." Below this, a horizontal line separates the address from the text "BOOK-POST." at the bottom left.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glasgow, County of Greater Glasgow, in Lat. 55° 55' N., Long. 2° 45' E., Distance from Sea 0 miles.

Height of Cistern of the Barometer above Mean Sea-level c. 20 feet, above Ground 5 feet.

During the MONTH of August 1867.

The Hours of Observation are of Greenwich Time (uncertain)

ELECTRICITY.	BAROMETER.			SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.			HYGROMETER, No. 83402			WIND.			RAIN.			CLOUDS.			THERMOMETERS, under Ground.			SEA. °F.			OZONE.			GENERAL REMARKS.										
	9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.			Exposed Black Bulbs.			9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.		Amount in inches.		Velocity, (0-6), and Direction, and Species.		Velocity, (0-10), and Direction, and Species.		Velocity, (0-10), and Direction, and Species.		Hours.		Temperature of WELL at Depth of feet, No. 9		Temperature of shade and grass, 9 a.m. and 9 p.m.		0-10.		As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Preventive Diseases, etc.	
	Barometer.	Attached Thermometer.	No. 1	Barometer.	Attached Thermometer.	No. 2	Max. No. 145	Min. No. 237	Sun's rays	Max. No. 145	Min. No. 237	Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	9 h. A.M.	Force	No. 145	No. 237	9 h. A.M.	Force	9 h. A.M.	Force	9 h. A.M.	Force	No. 3 inches.	No. 12 inches.	No. 22 inches.	9 A.M.	9 P.M.	Mention the hour at which Storms began and ended.	Days of Month.			
1	29.180	52	29.182	60.5	51	44	55	51	57.5	49	54	W	SW	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1				
2	29.196	58	29.190	58.4	60.5	46	51	49	50.5	49.5	51	SW	SW	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2					
3	29.196	58	29.1840	58.5	59	50.5	54	52.5	52.5	51	SW	SW	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3						
4	29.162	58.3	29.1716	59.5	60.5	51.5	54	53	52.5	51.5	51	SW	SW	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4						
5	29.196	51.5	29.1611	58	56	50	53	51	51.5	51	51	SW	SW	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5						
6	29.196	51.5	29.1708	58.5	59.5	49	51	50	51	49.5	50	NE	NE	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6						
7	29.194	51.5	29.1844	56.5	54	49	51.5	50.5	50.5	51	50.5	NE	NE	0.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7						
8	29.190	55	29.1930	51	51	44	50	49.5	51	49.5	50	NE	NE	0.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8						
9	29.190	55	29.1936	56.5	53	49.5	51	50.5	50.5	50	NE	NE	0.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9							
10	29.186	56	29.1829	51	51	49	51	49.5	51	50	NE	NE	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10							
11	29.190	56.5	29.1892	51	60	49.5	51	50	54	52.5	52	SW	SW	0.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11						
12	29.184	51.5	29.1904	58.5	59	48	51	50.5	53.5	52	SW	SW	1.50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12							
13	29.1930	51.5	29.1996	60	60.5	44.5	54.5	52	53.5	52.5	SW	SW	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13							
14	29.188	59.5	29.1926	59.5	61	46	55	52	51.5	50.5	SW	SW	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14							
15	29.182	51.5	29.1952	58.5	56	50	51	50.5	54	52	SW	SW	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15							
16	29.176	58.5	29.1914	59	61	51	55	52.5	53	52	SW	SW	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16							
17	29.174	51.5	29.1916	56.5	60	41.5	50	49	47.5	46.5	W	NW	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17							
18	29.174	51.5	29.1916	56.5	60	41.5	52.5	51.5	50.5	50.5	SW	SW	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18							
19	29.170	56.5	29.1928	56.5	60	43	49.5	48.5	47.5	47.5	SW	SW	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19							
20	29.176	55	29.1918	55	56	45	50	49.5	51.5	51.5	SW	SW	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20							
21	29.174	51.5	29.1914	56	51	49	51.5	48.5	50.5	50	SW	SW	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21							
22	29.176	56.5	29.1902	54.5	59	47	56	52.5	51.5	49	W	W	0.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22							
23	29.184	56	29.1830																																			

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS.

One of the objects of immediate importance that the "Scottish" registering the greatest heat from the sun's rays, and the least amount of cloud in the atmosphere will be found on the other side. The Meteorological Society has proposed to itself, to secure a from radiation during night. Their bulbs have a black coating, perfect uniformity in the system of observation pursued at all its which may easily, or mended by the application of a mixture of lamp black and printer's ink. They are placed in 20° or 30° of the zenith). The stratus of clouds that appear near the horizon are viewed ordinarily; and thus being unable to judge the distance between the wind. The "Maxim" should be freely exposed to the sun, of their amount, we ought not to take them into account in the Returns from any two stations, so very considerable as to and the "Maxim" should rest on wooden supports a few clouds' column, though their appearances and changes ought to be noted among the "Remarks." The amount of cloud is entered in the position or shelter of instruments, different hours of the day, and the sun's heat to affect the "Minima" by covered by clouds, 5 is entered as the "observation," and so on. Observations of the clouds are made at 9 A.M. and at sunset, kindly furnish Reports to the Society will, a serpentine 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.

Hour of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway time only) twice daily for some, and once (morning or evening) for other instruments, as specified in the following remarks. For comparison of Thermometers, properly tested Thermometers, or at the top of the schedules. It is hoped that the utmost care will be had, on loan, by any observer, from the Meteorological Observatory, 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 at what time it was taken, if not at 9 o'clock.

Barometer.—*Weather-glasses* and *Aneroids*, though admirably adapted, as the latter certainly are, to indicate variations of atmospheric pressure, are not well fitted for scientific purposes. Nor can any Barometer be used for Meteorological Observations, scales and frame to which they are attached.—The frame must not be supplied with such means of adjustment or compensation. The frame of the Thermometers is enclosed in a tube, which is to be brought the tubes forward by an inch, from any such as will secure the height of the mercury in the tube being board on which it may be suspended; the winter-cup must be 12, and 22 inches, and the stems above ground protected from wet bath, and little below the level of the sun's rays and fitted with sloping fins in collars, to prevent rain-water from entering the bulb.—In ease under the bulbs,—the muslin must be of yellow being conveyed to the bulb by the stems or wooden frames medium fineness, and fastened at the neck of the bulb by the Mention must be made of the geological formation and agricultural condition of the soil in which these Thermometers are placed.

Temperature of the Sea.—A knowledge of the temperature of the sea is not only in itself, but in its relations to that of our shores, and to the "anemos" of 4-tenths with *stratus* clouds; and that the sky is further observed to the extent of rays cast shadows, should be entered in the proper column.

Underground Thermometers.—As the germination and health of crops and plants greatly depend on the temperature of the soil,—its amount and constancy,—the Council recommend that observations in this interesting department be made at 9 A.M., by thermometers placed in the earth, their bulbs being sunk to 3, 5, 15, and 25 inches, and the stems above ground protected from the sun's rays and fitted with sloping fins in collars, to prevent rain-water from entering the bulb by the stems or wooden frames

medium fineness, and fastened at the neck of the bulb by the Mention must be made of the geological formation and agricultural condition of the soil in which these Thermometers are placed.

Temperature of Hills.—The temperature of the water at the bottom of wells ought, when practicable, to be taken, and the depth of the well and of the water noted.

Ozone.—Mention whether Schönborn's or Moffat's papers are used. The paper is affixed by a pin in the thermometer box, and the indication registered at 9 A.M. and 9 P.M. respectively. So also 40°, and 40°, more or less must be taken close for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are recognised and in use at Greenwich and Southampton, are given at the foot of the column.

Besides special and extraordinary observations, great prominence is given to this column, to prevalent diseases, differences in character, colour, velocity, and direction between the lower and upper strata of clouds, the colour of the sky etc. Remarks on the upper strata of clouds in connection with terrestrial phenomena, in connection with the periodic return of the seasons, possess only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena, that the published Summaries may fairly represent the whole of Scotland. Observation ought to be confined to individual trees and shrubs; to particular species of birds; and

Electricity.—Too much importance cannot be attached to electric condition of the atmosphere in connection with terrestrial phenomena, especially in the vicinity of an Observatory, and as a meteorological phenomenon. A proper

recording of the weather at 9 A.M. and 9 P.M. The thermometer is read at 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°.3, 40°.0, or 40°.4; or 40°.1, 40°.5, or 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°, and 40°, more or less must be taken to form a tight plug to the stem, and hanging them side by side, so that the forementioned requirements shall be complied with, as far as possible.

Reading of the Thermometer.—Great care must be taken to avoid the effects of refraction, by bringing the eye exactly opposite the tip of the index or column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. When the tip of the index or column of mercury, the reading of the thermometer, especially in the case 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 slight error here will vitiate the readings from the thermometer.

When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must be screwed so as to form a tight plug to the stem. Then screw up the of the mercury, and take the readings from the thermometer, especially in the case 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 slight error here will vitiate the readings from the thermometer.

In taking an observation, the attached Thermometer is first noted: the tube must then be gently tapped and the eastern end of the box arranged so as to open to "project" the thermometer carefully made. By raising and lowering the eye, the tube is a complete vacuum; this is the case when, in the instrument, so that the mercury strikes the top of the tube, a sharp top is produced. If this is prevented by air it may be removed to the eastern, and got rid of, by inverting the thermometer, the ivory peg, and gently tapping it; and if this plan fails, the instrument must be repacked.

The Barometer should be suspended in a good light, which on the 3rd of those days that are those of the phenomena commencing at 9 P.M. and extending till 9 A.M. on the 3rd. A wind-vane ought to be elevated 12 feet at least above surrounding objects. When it oscillates incessantly, the mean direction must be taken; and when it is stationary, and always when the wind is feeble, reference must be made to the anemometer, and the height of clouds overhead, and to the direction of smoke etc.

Careful observations ought to be made on the changes in the direction of the wind; and during storms, extra observations ought to be made at every hour of Greenwich time. Such on storms as have been limited at above. When lofty hills are in the vicinity of an Observatory, the height of clouds and of the snow-line in winter ought to be recorded.

The Council would strongly recommend that every observer, by furnishing a Hemispherical Cup Anemometer—self-registering instrument, which shows the amount of Wind and 9 P.M. ought to be registered, either in two columns, otherwise unoccupied, or in two ruled off for the purpose, from that headlined "Remarks." It is intended that observations by the Electrometer should be entered in this manner or on the side margin. Additional remarks may be made on the margin. Observations in connection with the periodic return of the seasons, possess only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena, that the published Summaries may fairly represent the whole of Scotland. Observation ought to be confined to individual trees and shrubs; to particular species of birds; and

Clouds.—Convenient abbreviations for Luke Howard's Classification of clouds, and for the Thermometers for nature of deduction on inference.

(By Order)

A. B.

To
Mr. ALEXANDER BUCHAN,

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK-POST.

Mr. Alexander Buchan,

SIMPLY LETTER

Have the goodness also to state why information you may be able to collect relative to the Crosses of Gratin, Hay, Potatoes, Turnips, Peas, etc., whether perhahs and the Agricultural condition of the districts generally; and the effects of weather, disease, etc.

Turnips, Peas, etc., whether perhahs and the Agricultural condition of the districts generally; and the effects of weather, disease, etc.

Turnips, Peas, etc., whether perhahs and the Agricultural condition of the districts generally; and the effects of weather, disease, etc.

Turnips, Peas, etc., whether perhahs and the Agricultural condition of the districts generally; and the effects of weather, disease, etc.

Turnips, Peas, etc., whether perhahs and the Agricultural condition of the districts generally; and the effects of weather, disease, etc.

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SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Guthrieham, Dari, County of _____, in Lat. $62^{\circ} 24'$, Long. $6^{\circ} 43' 8''$, Distance from Sea _____ miles. ~ 20 feet

Height of Cistern of the Barometer above Mean Sea-level 20 feet, above Ground 5 feet.

During the MONTH of September 1864.

The Hours of Observation are not of Greenwich Time (uncertain)

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER, No. 541-32				WIND.				RAIN.				CLOUDS.				THERMOMETERS, under Ground.				GENERAL REMARKS.	Days of Month.						
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.		Amount in inches.		Velocity, (0-6), and Direction.		Amount, (0-10), and Species.		Velocity, (0-6), and Direction.		Amount, (0-10), and Species.		Temperature of WELL at Depth of feet, No.		SEA. 5° C.	OZONE.	GENERAL REMARKS.			
		Barometer, * No. 41	Attached Thermometer No. 41	Barometer, No. 1165	Attached Thermometer No. 2239	Max. No. 1165	Min. No. 2239	Max. in Sun's rays No. 1165	Min. on Grass, No. 2239	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction, 9 h. A.M.	Force, 9 h. A.M.	Direction, 9 h. P.M.	Force, 9 h. P.M.	No. 9 h. A.M.	No. 9 h. P.M.	No. 9 h. A.M.	No. 9 h. P.M.	No. 9 h. A.M.	No. 9 h. P.M.	No. 9 h. A.M.	No. 9 h. P.M.	No. 9 h. A.M.	No. 9 h. P.M.	No. 9 h. A.M.	No. 9 h. P.M.								
1	1	30.030	54.5	30.994	56.3	55	49	50	48	50.5	48.5	50.5	50	NW	NW	NW	NW	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	
2	2	30.032	56	30.992	59	56	42	52	50	53.5	52	52	50	SW	SW	SW	SW	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	
3	3	29.995	57.8	29.892	60.3	68	51	53	51.5	52.5	52	52	SW	SW	SW	SW	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14		
4	4	29.968	58	29.896	59	55	50	52.5	52	53	52.5	52	52	52	SE	SE	SE	SE	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
5	5	29.922	58	29.866	59.4	59	48	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
6	6	29.922	57	29.880	58	57	46	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
7	7	29.904	58	29.814	59.8	58	49	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
8	8	29.934	57.8	29.928	58	60	50	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
9	9	29.914	57.1	29.870	59	57	45	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
10	10	29.880	57	29.884	59	58	49	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
11	11	29.936	56.4	29.830	57.6	56.5	50	52.5	52	51.5	51.5	51	51	SW	SW	SW	SW	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
12	12	29.938	57	29.912	58	55	46	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	
13	13	29.954	56.8	29.856	59.3	54.5	50	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
14	14	29.880	58.4	29.826	58	56	48	52.5	52	51.5	51.5	51	51	SE	SE	SE	SE	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
15	15	29.904	55	30.030	57.4	57	45	50	49	51.5	48.5	50.5	50	SE	SE	SE	SE	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
16	16	29.920	55	30.032	58.5	57	42	50	48.5	52	50.5	50	W	W	W	W	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
17	17	30.020	57	30.012	57.8	59	48	52	50	52	52	50	50	SW	SW	SW	SW	0.08	0.08</																		

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS.

Thornhaw
Sept. 24 (86)

To *S* SHIP
Mr ALEXANDER BUCHAN

Secretary of the Meteorological Society of Scotland

BOOK-POST



To *S*
Mr. ALEXANDER
Secret

SHIP LETTER

ALK
NO
652

11

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

SHRUBS, ETC.	Fruit in Blossom,	Fruit in Buds.	MIGRATORY BIRDS.	First Trip	Deleteriae.
Barberry,	Currants,	Quince,	Apple,	Bronzie or Elder,	Broom,
Bonnie or Elder,	Black Currants,	Cultiv.,	Blackberry,	Hawthorn,	Hazel,
Bronzie or Elder,	Blueberry,	House-Swallow,	Chestn.,	Gooseberry,	Holly,
Bronzie or Elder,	Currants,	House-Swallow,	Gooseberry,	Hawthorn,	Lamburum,
Bronzie or Elder,	Currants,	House-Swallow,	Hawthorn,	Holly,	Lilac,
Bronzie or Elder,	Currants,	House-Swallow,	Hawthorn,	Holly,	Laurel,
Bronzie or Elder,	Currants,	House-Swallow,	Hawthorn,	Holly,	Mountain Ash or Rowan,
Bronzie or Elder,	Currants,	House-Swallow,	Hawthorn,	Holly,	Rhododendron Ponticum,
Bronzie or Elder,	Currants,	House-Swallow,	Hawthorn,	Holly,	Red Flowering Currant,
Bronzie or Elder,	Currants,	House-Swallow,	Hawthorn,	Holly,	Whin,

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glasgow, County of Argyllshire, in Lat. 56° 2' N., Long. 5° 43' E. Distance from Sea no miles. c. 120 feet

Height of Cistern of the Barometer above Mean Sea-level 12 feet, above Ground 8 feet.

During the MONTH of October 1867.

The Hours of Observation are of Greenwich Time. (unseen)

ELECTRICITY.	DAYS OF MONTH.	BAROMETER.		SILVER-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER, No. 834-32				WIND.				RAIN.		CLOUDS.				THERMOMETERS, under Ground.				SEA. 830	OZONE.	GENERAL REMARKS.		DAYS OF MONTH.			
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.		Reading of the H.C. Anemometer No.		9 A.M.		P.M.		9 h. A.M.		Temperature of Well at Depth of feet, No.		Temperature at Surface and Depth, 9 A.M. 9 P.M.			
		Barometer, * No. 41	Attached Thermometer	Barometer, No. 41	Attached Thermometer	Max. No. 165	Min. No. 325	Max. in Sun's rays	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	Direction.	Force	No. of Squalls	Amount in inches.	Velocity, (0-6), and Direction, and Species.	Amount, (0-10), and Direction, and Species.	Velocity, (0-6), and Direction, and Species.	Amount, (0-10), and Direction, and Species.	Hours.	No. 3 inches.	No. 12 inches.	No. 22 inches.	0-10,	Mention the hour at which Storms began and ended.				
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	SW	W	SW	W	0	0.01						°	°	°	°					1
1	29,824	47	29,260	51	50	39		47	46	44	42	SW	W	SW	W	0	0.01							°	°	°	°					2	
2	29,050	48	29,656	47	51	36		41	41	40	39	SW	SW	SW	SW	0	0.09							°	°	°	°					3	
3	30,050	45	30,203	42	47	32		33	33	33	33	N	N	N	N	0	0.14							°	°	°	°					4	
4	30,164	43	30,122	43	44	32		36	35	35	34	N	N	N	N	0	0.01							°	°	°	°					5	
5	30,056	49	30,070	59	45	31		39	38	38	42	41	41	41	SW	SW	0	0.57							°	°	°	°					6
6	29,792	51	29,494	54	47	35		45	44	45	44	38	38	38	SW	SW	0	0.66							°	°	°	°					7
7	29,304	48	29,302	53	46	35		42	41	42	41	SW	SW	SW	SW	0	0.61							°	°	°	°					8	
8	29,484	46	29,724	52	49	33		42	41	38	36	N	N	N	N	0	0.08							°	°	°	°					9	
9	29,640	46	29,818	54	50	35		41	40	43	42	SW	SW	SW	SW	0	0.08							°	°	°	°					10	
10	29,826	49	29,622	56	52	37		45	44	51	50	SW	SW	SW	SW	0	0.44							°	°	°	°					11	
11	29,856	56	29,798	61	54	48		50	49	51	50	SW	SW	SW	SW	0	0.31							°	°	°	°					12	
12	29,794	58	29,802	60	53	45		49	49	47	45	S	S	S	S	0	0.66							°	°	°	°					13	
13	29,872	56	29,998	64	52	47		49	48	49	48	S	S	S	S	0	0.01							°	°	°	°					14	
14	29,994	55	29,924	58	50	47		49	48	49	48	S	S	S	S	0	0.01							°	°	°	°					15	
15	29,882	54	29,842	60	51	48		49	48	49	48	S	S	S	S	0	0.17							°	°	°	°					16	
16	29,742	55	29,592	60	52	45		48	47	48	47	S	S	S	S	0	0.46							°	°	°	°					17	
17	29,368	55	29,304	60	52	46		49	48	48	48	S	S	S	S	0	0.18							°	°	°	°					18	
18	29,282	56	29,238	60	50	46		49	48	49	48	S	S	S	S	0	0.02							°	°	°	°					19	
19	29,222	57	29,372	60	51	45		49	48	48	47	S	S	S	S	0	0.20							°	°	°	°					20	
20	29,536	55	29,582	60	51	45		49	48	48	47	S	S	S	S	0	0.05							°	°	°	°					21	
21	29,460	54	29,654	58	56	44		48	46	48	47	SW	SW	SW	SW	0	0.21							°	°	°	°					22	
22	29,442	54	29,630	59	60	44		50	48	48	45	W	W	W	W	0	0.08							°	°	°	°					23	
23	29,628	54	29,782	53	53	46		49	46	48	46	SW	SW	SW	SW	0	0.10							°	°	°	°					24	
24	29,818	54	30,008	58	50	41		47	46	46	45	SW	SW	SW	SW	0	0.18							°	°	°	°					25	
25	29,852	54	29,644	51	54	46		50	49	49	48	SW	SW	SW	SW	0	0.31							°	°	°	°					26	
26	29,428	50	29,204	52	52																												

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

WITH REMARKS ON THE USE OF INSTRUMENTS.

One of the objects of immediate importance that the "Scottish" registering the greatest heat from the sun's rays, and the least nomenclature of clouds will be found on the other side. The "Metereological Society" has proposed to itself;—To secure a from radiation during night.—Their bulbs have a black coating, amount of cloud in the atmosphere ought to be estimated from *perfect uniformity* in the system of observation pursued at all its which may easily be made, or modified, by the application of a greater or less obscuration of the sky overhead (i.e., within stations. A certain degree of uniformity is absolutely necessary mixture of lamp-black and printer's ink. They are placed in to justify the publication of Monthly Results from different aallow blackened boxes, whose sides project the bulbs from the horizon are viewed obliquely; and thus, being unable to judge observations; and it is found that differences between the wind. The "Maximus" should be freely exposed to the sun, of their amount, we ought not to take them into account in the Returns from any two Stations, so very considerable as to clouds' column, though their appearances and changes ought to render them quite incomparable, may arise from dissimilarity inches from the surface of the grass, in an open situation, in the position or shelter of instruments, different hours of observation, or even from the use of differently constructed snow must not be allowed to cover either of these Thermometers; from a scale of 0 to 10; thus, when the sky *overhead* is half instruments. It is therefore hoped, that those persons who distilled, an accuracy and value commensurate with the labour used by the Society, an entire comparsion will be made on the results of the atmosphere. The entries in the schedule are to fully furnish Reports to the Society will by a scrupulous attention to the following Directions, secure for their Monthly Observations, an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, without which the instruments will be necessarily fail in achieving one of the main objects of Meteorological Observation.

Hour of Observation.—The Council recommend that Observations be made precisely at 9 o'clock (Greenwich or Railway time only) twice a day for some, and once (morning or evening) for other instruments, as specified, in the following remarks. For comparison of Thermometers, a properly tested Thermometer at the top 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 mounted on one frame. The Hygrometer consists of two Thermometers usually, but 2 *depths* of clouds travel with *extreme* velocity from S.W. towards the lower regions from W., with one-third the (extreme) speed of the former. Again, in the second "Cloud" to be compared with the dry bulb of the Hygrometer. The former, the amount of cloud is entered, from a scale of 0 to 5; thus, when the sky *overhead* is half covered by clouds, 5 is entered as the *observation*, and so on.

Verification of Thermometers.—No instrument ought to be used for Meteorological purposes, if 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 *retested*. The self-registering, "Maximus" Thermometers ought frequently and those in the lower regions from W., with one-third the (extreme) speed of the former. Again, in the second "Cloud" to be compared with the dry bulb of the Hygrometer. The former, the amount of cloud is entered, from a scale of 0 to 5; thus, when the sky *overhead* is half covered by clouds, 5 is entered as the *observation*, and so on.

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Temperature of the Sea.—A knowledge of the temperature of the sea, is not only in itself, but in its relations to that of our island, a very important branch of Meteorology. The Council, therefore recommend that the temperature of the sea be conveniently taken by a properly constructed apparatus, from the ends of piers and rocks round the coast, where it is not influenced by that of river water. At or near the time of high water, on the 5th, 15th, and 25th of each month, the thermometer ought to be sunk exactly six feet (one fathom), and after ten minutes have elapsed, drawn up and read. 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; and continuing to observe for partial depths.

Temperature of the Water at the Well.—The temperature of the water at the well, must be taken, if not at 9 o'clock, at 9 A.M. and 9 P.M. The self-registering Thermometers are read at 9 A.M. and 9 P.M. The thermometer will be read -39°, -30°, 40°, 0°, 40°, 1°; or 40°, 5°, 40°, 5°, or 40°, 6° according as it indicates a little more or less than 40°.

Ozone.—Mention whether Schönlein's or Moffat's papers are used. The paper is affixed by a pin to a board in the thermometer box, and the indication registered at 9 A.M. and 9 P.M. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are recognised and in use at Greenwich and Southampton, are given at the foot of the column. Some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned.

Remarks.—The "Remarks" column is too narrow, but unavoidable so. Some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are recognised and in use at Greenwich and Southampton, are given at the foot of the column. Some of the most valuable observations, great prominence ought to be given in this column to prevalent diseases, differences in character, colour, velocity, and direction between the lower and upper strata of clouds, the colour of the sky, etc. Remarks on the scale 0-6 is 4°, i.e., that it is *blowing fresh*.

Electricity.—Too much importance cannot be attached to electric condition of the atmosphere in connection with terrestrial magnetism, and as a meteorological phenomenon. A proper thermometer is necessary to every complete meteorological observatory.

Observations.—The observations ought to be taken, and the depth of the well and of the water noted.

Wind.—A wind-vane ought to be elevated 12 feet, at least above surrounding objects. When it oscillates incessantly, the mean direction must be taken; and when it is stationary and plan fails, the instruments must be removed. Before suspending the Barometer for use of the observer.

Hygrometer.—The Hygrometer is read at 9 A.M. and 9 P.M. The self-registering Thermometers are read at 9 A.M. and 9 P.M. Careful observations ought to be made on the changes in the stormy weather. The force of the wind, the hour of rain, and remnant falls of snow, hail, or rain, the hour of the sun's direct rays, or the heat of a fire.

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Barometer.—The Barometer should be suspended in a good light, which is a complete vacuum; so that the mercury strikes the top of the tube, a sharp tap is produced. If this is prevented by air it temperature at 24 hours preceding. It is not a matter of the sun's direct rays, or the heat of a fire.

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SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Ghurshawn Duro, County of _____, in Lat. 62° 24', Long. 6° 43' 8", Distance from Sea no miles. 120 feet

Height of Cistern of the Barometer above Mean Sea-level 12 feet, above Ground 8 feet.

During the MONTH of November

18 67

The Hours of Observation are of Greenwich Time. Uncertain

DAYS OF MONTH.	BAROMETER.				SELF-REGISTERING THERMOMETERS, READ DAILY, AT 9 P.M.				HYGROMETER, NO. 831-32				WIND.				RAIN.	CLOUDS.				THERMOMETERS, UNDER GROUND.	TEMPERATURE OF WELL AT DEPTH OF FEET, NO. 320	SEA LEVEL AT 1 FATHOM, AND DEPTH, 9 A.M. 9 P.M.	OZONE	GENERAL REMARKS.				DAYS OF MONTH.			
	9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.			Readings of the H. Cup Anerometer		No. of hours in which it fell.	Velocity, (0-10), and Direction, 9 h. A.M.	Velocity, (0-10), and Direction, 9 h. P.M.	Amount, (0-10), and Species.	Amount, (0-10), and Species.	SUNSHINE, HOURS.	No. 3 inches.	No. 12 inches.	No. 22 inches.	Temperature of Well, No. 0-10.	Temperature at 1 fathom, and Depth, 9 A.M. 9 P.M.	Mention the hour at which storms began and ended.		
	No. 911	Barometer.	Attached Thermometer.	No. 911	Barometer.	Attached Thermometer.	No. 165	No. 213	Max. in Sun's rays.	Min. on Grass.	No. 911	No. 911	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	9 h. A.M.	No. 165	No. 213	No. 165	No. 213	Hours.	No. 3 inches.	No. 12 inches.	No. 22 inches.	Temperature of Well, No. 0-10.	Temperature at 1 fathom, and Depth, 9 A.M. 9 P.M.	Mention the hour at which storms began and ended.	No. 911
1	29.920	48	30.020	50.5	45	35	0	0	39	38	36	35	NW	NW	46	45	NW	NW	—	0.36	—	—	—	—	—	—	—	—	—	—	—	—	1
2	30.204	45	30.124	52.5	48	36	0	0	39	37	40.5	39	SW	SW	46	45	SW	SW	—	0.09	—	—	—	—	—	—	—	—	—	—	—	—	2
3	29.921	50	29.916	51.5	49	31	0	0	46	42	40	37.5	N	N	46	42	N	N	—	0.33	—	—	—	—	—	—	—	—	—	—	—	—	3
4	30.244	42	30.164	49	43	31.5	0	0	39.5	32	33	32	N	N	46	42	N	N	—	0.18	—	—	—	—	—	—	—	—	—	—	—	4	
5	30.248	48	30.266	52.5	49	31.5	0	0	39.5	39	48.5	47	W	W	46	42	W	W	—	0.18	—	—	—	—	—	—	—	—	—	—	5		
6	30.256	52.5	30.148	52.5	50	46	0	0	46.5	47.5	49.5	46	W	W	46	42	W	W	—	0.06	—	—	—	—	—	—	—	—	—	—	6		
7	29.852	52	29.918	53	47	37	0	0	46	42	42	40	W	W	46	42	W	W	—	0.25	—	—	—	—	—	—	—	—	—	—	7		
8	30.116	48.5	30.322	50	51	43	0	0	46.5	42.5	50	49	NW	NW	46	42	NW	NW	—	0.06	—	—	—	—	—	—	—	—	—	—	8		
9	30.298	52	30.448	57	49.5	36	0	0	49.5	42.5	41.5	40	W	W	46	42	W	W	—	0.16	—	—	—	—	—	—	—	—	—	—	9		
10	30.428	53.5	30.386	57.5	49	38	0	0	49	40	42.5	40.5	NW	NW	46	42	NW	NW	—	0.03	—	—	—	—	—	—	—	—	—	—	10		
11	30.182	53.5	30.032	59.5	65	45.5	0	0	48.5	47	49.5	46.5	NW	NW	46	42	NW	NW	—	—	—	—	—	—	—	—	—	—	—	11			
12	29.962	55	29.914	52	62	41	0	0	42.5	41.5	42	40	W	W	46	42	W	W	—	0.26	—	—	—	—	—	—	—	—	—	—	12		
13	29.864	51	29.842	48	43	31	0	0	42.5	39.5	41.5	39.5	Calm	Calm	46	42	Calm	Calm	—	—	—	—	—	—	—	—	—	—	—	13			
14	29.819	44	30.038	55	52	40	0	0	44	42.5	42.5	40.5	E	E	46	42	E	E	—	0.07	—	—	—	—	—	—	—	—	—	—	14		
15	30.246	44	30.310	50	41	33	0	0	37	35.5	35	34	NW	NW	46	42	NW	NW	—	0.02	—	—	—	—	—	—	—	—	—	—	15		
16	30.396	46	30.311	49	42	32	0	0	33.5	30.5	30.5	28.5	NW	NW	46	42	NW	NW	—	0.02	—	—	—	—	—	—	—	—	—	—	16		
17	30.140	50	30.140	55	46	39.5	0	0	45	43.5	44.5	41.5	NW	NW	46	42	NW	NW	—	—	—	—	—	—	—	—	—	—	—	17			
18	30.092	51	30.084	54.5	49	39.5	0	0	46.5	44.5	45	40.5	W	W	46	42	W	W	—	0.14	—	—	—	—	—	—	—	—	—	—	18		
19	30.364	43	30.350	48	37	31	0	0	35.5	32.5	33.5	32	N	N	46	42	N	N	—	—	—	—	—	—	—	—	—	—	—	19			
20	30.626	41	30.660	49	38	32	0	0	36	32.5	37	34.5	NW	NW	46	42	NW	NW	—	—	—	—	—	—	—	—	—	—	—	20			
21	30.592	44.5	30.592	54	51	35	0	0	46	44.5	48	46	NW	NW	46	42	NW	NW	—	0.06	—	—	—	—	—	—	—	—	—	—	21		
22	30.624	49.5	30.626	55	48.5	34.5	0	0	41.5	38.5	42.5	41	N	N	46	42	N	N	—	0.02	—	—	—	—	—	—	—	—	—	—	22		
23	30.490	51	30.366	56	48	31.5	0	0	43.5	42.5	44	43.5																					

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS,
WITH DEMANDS ON THE PERSONS OR INSTITUTIONS

WITH REMARKS ON THE USE OF INSTRUMENTS

The Boxes are arranged so as at once to "protect" the Lind's Anemometer is also recommended; the method of *Establishing Wind Force* by such tables as that given in the schedule is, to say the least, unsatisfactory.

Rain-gauges.—Many causes conspire to produce anomalies in rain returns. They arise, partly, from unfavourable situation for observation and partly from the defective nature of the instruments used. It is, indeed, difficult to obtain an unexceptionable position for the rain-gauge; but in all cases the gauge must be sunk in the ground till its edges are on a level with the close cut grass around its mouth. The rain-gauge ought to be read daily, and the readings entered in the returns on the day on which the rain fell.

Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—when a Snow shower occurs it must 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 instrument repeated against the palm of the hand; when the spirit distils by high temperature, it will be found in

the force of the Wind, at any particular hour of observation, margin. Additional remarks may be made on the margin.

"Observations in connection with the periodic return of the seasons" possess not only great scientific value, but are of considerable interest to the Agriculturist. The Council would direct the special attention of Observers to the registration of such phenomena; that the published Summaries may fairly represent the whole of Scotland. Observation 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 Council recommend that *term day* observations be taken; —viz., on the 21st days of March, June, September, and December.

Full directions for the use of the instruments mentioned above have been printed, and may be had along with them from the makers.

The Council have agreed to recommend that observers, before purchasing new instruments, should communicate with the Meteorological Secretary, and they consider it desirable that he

Murshad
Nov. 1860)

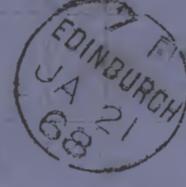
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Mr ALEXANDER BUCHAN

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK-POST



OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASOX.

DINBTBGM, 9th December 1865.

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the *l*-series of the genus *L* is the same as the *l*-series of the genus *M*.

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SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Thorntoun Park, County of ..., in Lat. $62^{\circ} 24'$, Long. $6^{\circ} 43' 8''$, Distance from Sea 120 feet miles.

Height of Cistern of the Barometer above Mean Sea-level 12 feet, above Ground feet.

During the MONTH of December 1867.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER, No. 831-32				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA. 530	OZONE.	GENERAL REMARKS.		Days of Month.
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.				Exposed Black Bulbs.				9 h. A.M.		9 h. P.M.		Readings of the H-Cup Anemometer		No. of hours in which it fell.	Amount in inches.	P.M.		9 h. A.M.		9 h. P.M.		Temperature of WELL at Depth of feet, No. 0-10.		Temperature of Ground and Brisket, 9 A.M. 9 P.M.		
		Barometer, * No. 91	Attached Thermometer	Barometer, No. 91	Attached Thermometer	Max. No. 716	Min. No. 3227	Max. in Sun's rays No. 1	Min. on Grass. No. 2	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	No. 7847	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.	Hours.	No. 3 inches.	No. 12 inches.	No. 22 inches.	As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevailing Diseases, etc.		
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	N.E.																		
1	29,646	34.3	29,768	36.4	37	18.5		24.3	24	19.3	19	N.E.																				1
2	29,985	35	30,234	41.6	27	15		20.1	19.7	26.2	24.9	N.E.	calm																			2
3	29,436	46.6	29,818	53.4	48.5	20.5		43.6	41.8	46.3	44	N.W.																				3
4	29,446	50.5	29,694	50	51	32.5		44.6	43.3	33.7	33.5	W																				4
5	29,992	41	30,216	42.5	36.5	22		28.3	26.7	24	22.7	N	N																			5
6	30,476	34	30,568	47.4	34.5	20.5		21.5	20.2	33.1	30.6	N.W.																				6
7	30,420	46	30,280	47	47	32.5		41.3	40.1	43.7	W	N.W.																				7
8	30,192	47	30,070	49.4	47	37		38.3	36.4	45.3	44.6	calm																			8	
9	29,912	50.5	29,916	52	47	42		43.3	40.6	45	42.1	N.W.																			9	
10	29,750	49.0	29,814	51	52.5	42.5		48.1	42.4	46.4	45.8	N.W.																			10	
11	29,632	50.9	29,880	43.8	50	32		46.1	42.7	34.3	32.2	N.W.																		11		
12	29,440	45	29,762	50	44.5	34.5		43.3	38.8	41.1	37.6	N.W.																		12		
13	29,412	41	29,614	54	49	36		36.1	34.4	44.9	47.1	N.W.																		13		
14	29,010	50	28,924	52	48.5	34		41.3	34.6	38.9	36.3	S.W.																		14		
15	29,198	46	29,214	45	43	34		39.1	36.9	38.8	36.5	S.W.																		15		
16	29,152	44.5	29,092	53	43	32.5		37.8	36.4	35.8	35.1	S.W.	calm																	16		
17	29,186	48.5	29,250	49.1	37	24.5		33	30.4	28.4	26.1	N.W.																		17		
18	29,440	44	29,702	39	39	28.5		34.6	33.2	33.7	32.8	N.E.																		18		
19	29,874	36.5	29,896	38	36	24		34.1	32.6	35.2	32.8	calm																		19		
20	29,804	42	29,666	46	39.5	34		39.8	37.4	39.5	38.2	S																		20		
21	29,610	43	29,144	51.4	50.5	40.5		42.3	41.2	46.8	44	S.E.																		21		
22	28,450	49.4	29,320	49.8	48.5	33.5		41.1	38.3	43.1	39.1	S.W.																		22		
23	29,792	44	29,810	51.2	45	32.5		40.3	36.1	44.4	42.3	W																		23		
24	29,620	51.1	29,702	50.4	48	38.5		45.1	44.4	43.1	42.6	S																		24		
25	29,610	49.6	29,554	52.3	54	40.5		46.1	45.2	48.3	47.4	S.W.																		25		
26	29,964	51.3	30,146	51.8	49.5	33.5		42	39.4	37	36.1	W	S.W.																	26		
27	29,966	52.4	30,052	53.3	51.5	34		49.1	47.9	43.1	41.3	S.W.																		27		
28	30,342	51	30,576	47.4	35.5	29.5																										

